

**ENVIRONMENTAL  
ASSESSMENT**

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**GERING-STEGALL  
115-kV TRANSMISSION  
LINE CONSOLIDATION  
PROJECT**

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**Scotts Bluff County, Nebraska**



**U.S. DEPARTMENT OF ENERGY  
WESTERN AREA POWER ADMINISTRATION  
LOVELAND AREA OFFICE  
LOVELAND, COLORADO**

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**May 1995**

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# **Environmental Assessment**

## **GERING-STEGALL 115-kV TRANSMISSION LINE CONSOLIDATION PROJECT**

**Scotts Bluff County, Nebraska**

### **DISCLAIMER**

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**U.S. Department of Energy  
Western Area Power Administration  
Loveland Area Office  
Loveland, Colorado**

**DOE/EA-0194**

**May 1995**

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## SUMMARY

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The Western Area Power Administration (Western) proposes to consolidate segments of two transmission lines near the Gering Substation in Gering, Nebraska. The transmission lines are both located in Scotts Bluff County, Nebraska within the City of Gering. Presently, there are three parallel 115-kilovolt (kV) transmission lines on separate rights-of-way (ROW) that terminate at the Gering Substation. The project would include dismantling the Archer-Gering wood-pole transmission line and rebuilding the remaining two lines on single-pole steel double circuit structures. The project would consolidate the Gering-Stegall North and Gering-Stegall South 115-kV transmission lines on to one ROW for a 1.33-mile segment between the Gering Substation and a point west of the Gering Landfill. All existing wood-pole H-frame structures would be removed, and the Gering-Stegall North and South ROWs abandoned.

The Gering-Stegall transmission lines, which are single circuit, wood-pole H-frame design, serve electrical load in the North Platte Valley. Western's customers in the region include the City of Gering and Roosevelt Public Power District (Roosevelt). The Gering-Stegall South line was built in 1950, and the Gering-Stegall North line was built in 1956. The Archer-Gering line was constructed in 1939 and deenergized in 1986. In 1986 the Archer-Gering transmission line was dismantled except for a 1.33-mile segment in the City of Gering.

Western's purpose in pursuing this project is to eliminate routine access problems to the transmission lines, increase reliability of the transmission lines, and reduce overall maintenance of the lines by consolidating and modernizing the system. Within the City of Gering, all three transmission lines currently pass over houses, the Gering High School parking lot and tennis courts, a church and a landfill. There are about 25 houses in the ROW, and about 15 others with parts of their property in the ROW. The homes and other facilities were built within the ROW's after the transmission lines were constructed. Due to ROW access and encroachment problems under the transmission lines, routine and emergency maintenance on the lines has become increasingly difficult. The proposed action would consolidate two transmission lines into one ROW, and dismantle a third. The two abandoned

transmission line ROWs would revert back to the underlying landowners. This consolidation would enhance access for routine and emergency maintenance by locating the double-circuit line adjacent to a public road. It would also reduce the occurrence of incompatible land uses within the transmission line ROW.

Western conducted a public meeting in Gering, Nebraska on February 3, 1994 to present project needs; and identify environmental issues, alternative designs, and alternative routes. Several actions were considered as alternatives to the proposed action including "no action", alternative electrical systems, alternative structure designs and alternative routes.

Under the No Action Alternative, Western would not consolidate the existing Gering-Stegall 115-kV transmission lines, and would only perform essential maintenance activities as needed. The No Action Alternative would not eliminate ROW encroachment problems and therefore is not considered as a reasonable alternative for this project.

As part of its marketing policies, Western encourages energy conservation through the promotion of efficient and economic uses of energy, and through the use of renewable resources such as hydro, wind, solar, and geothermal energy sources. However, the purpose and need for the Gering-Stegall consolidation project cannot be met by energy conservation. The purpose of this project is to eliminate maintenance problems associated with encroachments along the existing ROW. Therefore energy conservation is not considered as a reasonable alternative for this project.

Two basic design alternatives were evaluated; underground construction and overhead construction. Underground construction would be very difficult given the technical difficulty and expense of burying two large 115-kV transmission lines. Several design alternatives were evaluated for overhead construction, including single and double circuit designs. Because of the space constraints of the various routes and the overall goal of reducing the number of residences affected by the line, a double-circuit design was selected for overhead construction.

Several potential alternative routes were identified based on review of aerial photography and field reconnaissance, and input from the public meeting. The alternative routes included North Side of U Street, South Side of U Street, North of High School, Park, and Railroad

Right-of way to Highway 71 alternatives. All except one of the routes had significant problems which resulted in them not being carried forward for full analysis in the EA. The North Side of U Street alternative is Westerns proposed route.

Analyses of the potential effects of the proposed project on the human environment revealed no significant impacts.

Although current residential, institutional, industrial, and recreational land uses in the study area are generally sensitive to the construction and operation of transmission lines, the proposed project would result in reduced impacts to these land uses over the long-term due to less intrusion on private properties by Western personnel and their equipment during maintenance activities. Maintenance activities would be less intrusive because the new transmission structures would be fewer in number and far more accessible. At present, there are 31 structures along the three existing transmission lines. Under the Proposed Action, the number of structures would be reduced to 11-14. Moreover, the new transmission line structures would be located immediately adjacent to U Street, instead of on private properties which generally have poor access for equipment. If the proposed action utilized 11 or 12 structures, there would be a net removal of seven structures from residential properties, two from church property, and four from the high school. These numbers might vary slightly if 13 or 14 new structures are used. The ROW for the Proposed Action would cross nine residential properties, compared to 31 under existing conditions.

Construction of the proposed project would not affect planned land uses because the new structures and transmission lines would be located to the south of these new developments. No physical intrusion of construction workers or operation and maintenance personnel or associated equipment would be required at the locations of known planned developments.

The proposed new double circuit transmission line, like the existing Gering-Stegall transmission lines, would be constructed to NESC standards. The operation of the transmission line would not present a safety or electrical hazard to the general public. The new transmission line would be constructed at the edge of U Street, a city street. Overall, potential safety hazards from activities such as kite flying and tree trimming, or ROW encroachments, would be greatly reduced (a reduction of 3 to 1). The new project would have less opportunity for interaction with people and hazardous activity than the existing

transmission lines. The existing Gering-Stegall transmission lines, which presently span over homes and backyards in a residential neighborhood, would be removed. And finally, the new transmission line would require less maintenance than the existing lines reducing shock hazard exposure for linemen and maintenance forces.

Western's standard grounding policies effectively mitigate the possibility of nuisance shocks due to induced currents from stationary objects such as fences and buildings. No special safety measures would be necessary for any of the project design alternatives.

Since this project does not involve upgrading the voltage of the lines and the current and electrical load of the circuits would remain the same, calculated field effects are very similar between existing conditions and the proposed action. Calculated corona effects such as audible noise, radio and television interference and ozone would not change significantly. However, electric field and magnetic fields would be less for the Proposed Action than currently present for the existing transmission lines.

The proposed routing for the new double circuit transmission line would reduce the number of residences exposed to EMFs. Overall, the project would provide several benefits relative to reducing potential safety hazards and reducing EMFs. However, the electric and magnetic fields associated with either the existing single circuit transmission lines or for the proposed double circuit transmission line are not anticipated to adversely affect public health nor adversely effect public safety.

The proposed project would result in a small short-term increase in population in Gering, due to employment of contract construction workers. A temporary increase in population of 30 people would represent an increase of less than 1 percent. Construction, operation, and maintenance of the proposed project should not increase or decrease the need for police, fire, medical, or other community resources in the project area. It is unlikely that the proposed project would have a perceptible impact on the study area economy because there should be little or no reduction in local agricultural production and tourist visitation to the Scotts Bluff National Monument should not change.

The Proposed Action would require an easement width of 52 feet. Western has offered to purchase the affected homes and relocate property owners within the easement boundaries as

required under the Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970. At the present time, it is unclear how many households will participate in the acquisition program and will be relocated as a result of the proposed project. Since Western would compensate and relocate any households that would be acquired as a result of the project, housing-related impacts would be mitigated to a level of insignificance. Homeowners currently located within the proposed project easement may elect not to sell their homes to Western and could remain permanently. This project will not disproportionately impact minority and low-income populations.

Construction of the Proposed Action would not impact any significant archaeological or historic sites. For compliance with the National Historic Preservation Act, specifically Section 106, Western will consult with the Nebraska State Historic Preservation Officer (SHPO) concerning the National Register eligibility of sites within the Proposed Action. Western will also consult with the SHPO and National Park Service concerning impacts to potentially eligible sites.

The Proposed Action would generally have moderately positive visual impacts. Removal of the 31 H-frame structures would reduce the amount of vertical line contrasts existing in the landscape. The new single steel poles would tend to consolidate the visual contrasts, changing the view from one that has many, lower intensity contrasts to one with fewer. However the size of the new steel structures would be noticeably larger than the H-frame structures. There are a number of other transmission lines and other structures in the vicinity of the Proposed Action, and the Proposed Action would not result in substantial changes in the visual landscape of the study area.

Views from Scotts Bluff National Monument would generally encompass only a portion of the Proposed Action. From the South Overlook, all of the structures of the Proposed Action would be hidden behind a peninsular landform extension of Scotts Bluff. The visual change would create a positive effect from removal of one H-frame, resulting in a net decrease in 2 vertical poles within the view. However, there are a number of other transmission line structures evident in the view from the South Overlook, and the visual improvement would be slightly additive.

Views from the parking lot on top of Scotts Bluff would encompass most of the project area,

in a middleground to background distance zone. However, due to the distance and the urban backdrop of the view, only the western 2 or 3 new structures would be visually evident. There would be a moderately positive impact due to removal of 10 structures from within the middle view (0.5 to 1.0 mile). However, the highly modified landscape of the view would tend to reduce the significance of any visual change: the westernmost structure would be in agricultural land, and the next two structures east will be adjacent to a landfill.

The Proposed Action would be hardly visible from the Scotts Bluff National Monument Visitors Center, due to distance and foreground topographic screening. Due to a low ridge in between the project area and the Visitors Center, only the upper half of the transition structure would be visible, and all of the other new structures would be hidden from view. The partial view of the transition structure would be insignificant compared to other more visually evident vertical elements on the horizon. The result would be no noticeable beneficial or adverse effects.

Views from the trail from the parking lot on top of Scotts Bluff to the Visitors Center would be generally similar to those from the parking lot, but from a lower angle. No portion of the Proposed Action would be visible from the North Overlook on Scotts Bluff.

Six or seven of the new structures would be located immediately adjacent to U Street within the urban portion of the City of Gering. The new larger scale structures would be wider and taller than the poles of the existing H-frame structures. However, since the proposed action involves removal of 15 structures from within the urban area and replacing them with significantly fewer but more massive structures, the overall visual impact is likely to be about the same as under existing conditions.

Coordination with the U.S. Fish and Wildlife Service revealed the potential occurrence of listed threatened or endangered species. Within the project area, these include the bald eagle and peregrine falcon. The Proposed Action should have no effect on peregrine falcons and bald eagles and no mitigation is recommended.

The only wetlands are found in the northern part of the study area, nearly one mile from the proposed route. Since no wetlands occur in or adjacent to the proposed route, the Proposed Action would have no effect on wetlands and no mitigation is recommended.

No impacts to surface water resources would occur as a result of the proposed project because the transmission lines would span both the Gering Irrigation Canal and the intermittent drainage nearby.

Since the proposed Gering-Stegall Transmission Line would not cross any designated 100-year or 500-year floodplains, there would be no flood-related impacts associated with the project.

There would be short-term, minor impacts to soils. Such impacts are addressed by Western's standard construction practices and are not significant.

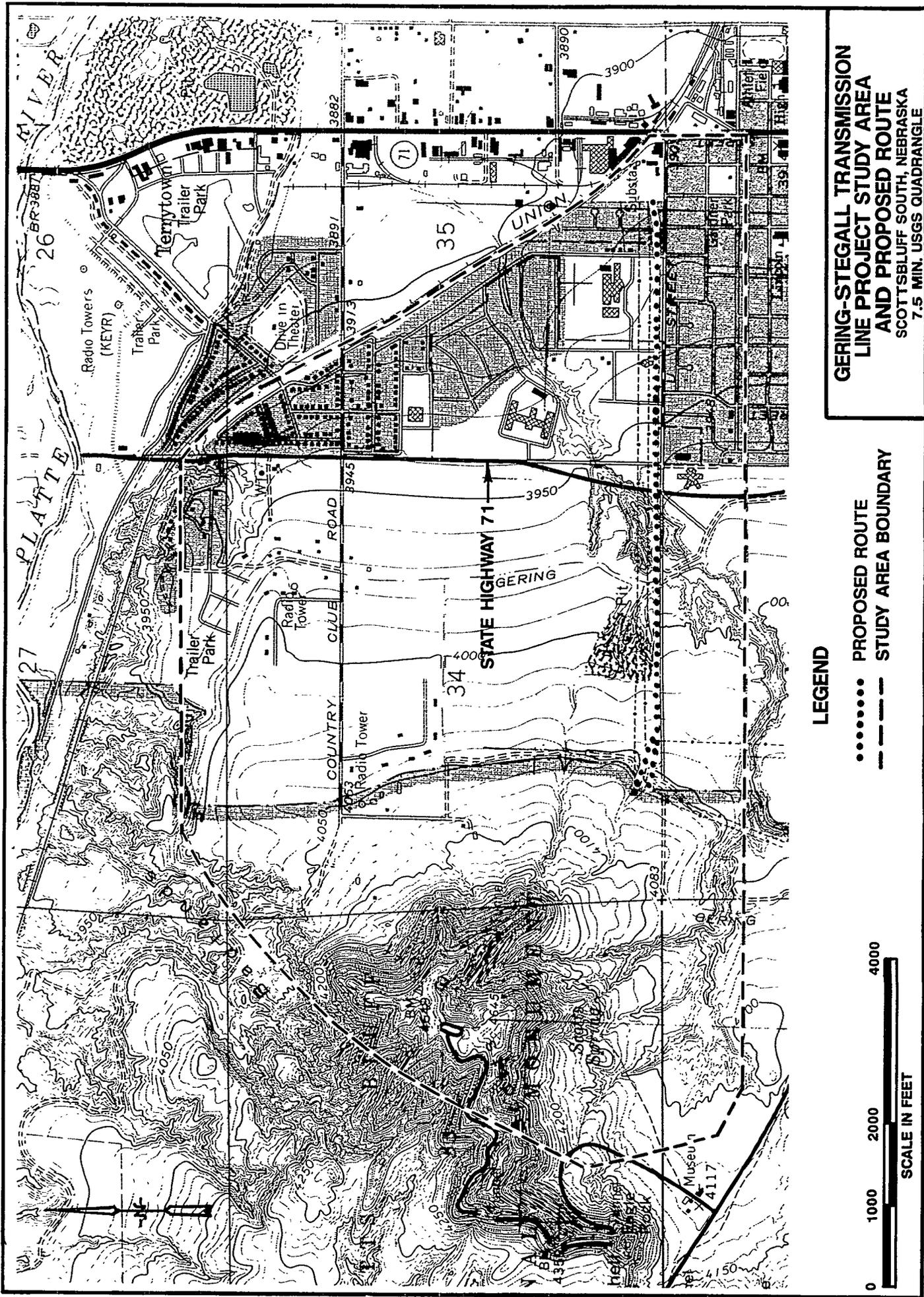
**1.1 INTRODUCTION**

The Western Area Power Administration (Western) proposes to consolidate segments of two transmission lines near the Gering Substation in Gering, Nebraska (Figure 1-1). The transmission lines are both located in Scotts Bluff County, Nebraska within the City of Gering. Presently, there are three parallel 115-kilovolt (kV) transmission lines on separate rights-of-way (ROW) that terminate at the Gering Substation. The project would include dismantling the Archer-Gering wood-pole transmission line and rebuilding the remaining two lines on single-pole steel double circuit structures. The project would consolidate the Gering-Stegall North and Gering-Stegall South 115-kV transmission lines on to one ROW for a 1.33-mile segment between the Gering Substation and a point west of the Gering Landfill. All existing wood-pole H-frame structures would be removed, and the Gering-Stegall North and South ROWs abandoned.

The Gering-Stegall transmission lines, which are single circuit, wood-pole H-frame design, serve electrical load in the North Platte Valley. Western's customers in the region include the City of Gering and Roosevelt Public Power District (Roosevelt). The Gering-Stegall South line was built in 1950, and the Gering-Stegall North line was built in 1956. The Archer-Gering line was constructed in 1939 and deenergized in 1986. In 1986 the Archer-Gering transmission line was dismantled except for a 1.33-mile segment in the City of Gering.

**1.2 PURPOSE AND NEED**

Western's purpose in pursuing this project is to eliminate routine access problems to the transmission lines, increase reliability of the transmission lines, and reduce overall maintenance of the lines by consolidating and modernizing the system. Within the City of Gering, all three transmission lines currently pass over houses, the Gering High School parking lot and tennis courts, a church and a landfill. There are about 25 houses in the ROW, and about 15 others with parts of their property in the ROW. The homes and other



**GERING-STEGALL TRANSMISSION  
LINE PROJECT STUDY AREA  
AND PROPOSED ROUTE  
SCOTTSBUFF SOUTH, NEBRASKA  
7.5 MIN. USGS QUADRANGLE**

- LEGEND**
- ..... PROPOSED ROUTE
  - - - - - STUDY AREA BOUNDARY

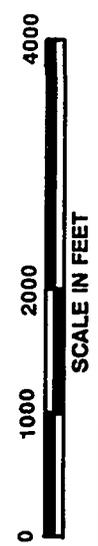


FIG. 1-1

facilities were built within the ROWs after the transmission lines were constructed. Due to ROW access and encroachment problems under the transmission lines, routine and emergency maintenance on the lines has become increasingly difficult. The proposed action would consolidate two transmission lines into one ROW, and dismantle a third. The two abandoned transmission line ROWs would revert back to the underlying landowners. This consolidation would enhance access for routine and emergency maintenance by locating the double-circuit line adjacent to a public road. It would also reduce the occurrence of incompatible land uses within the transmission line ROW.

### **1.3 PUBLIC INVOLVEMENT**

A public meeting was held in Gering, Nebraska on February 3, 1994. Approximately 31 members of the public attended the meeting. Presentations were given on the project need, project description and schedule, the environmental process, and the environmental studies being done for the project. A presentation was also given on the visual resource analysis studies done for the project including the computer assisted photosimulations. The presentations were followed by a question and answer period where members of the public expressed their concerns. Major public concerns included the need for human health and EMF issues to be included in the environmental analysis along with several questions about EMF fields in general and questions about the feasibility of underground construction. An alternative route, the Highway 71 to Railroad ROW, was proposed by the public and is discussed in this EA.

On February 4, 1994, Western met with interested homeowners at Gering High School to discuss electromagnetic fields and to measure EMF under Western's existing transmission lines. Measurements were taken at Gering High School, along the south side of U Street, at specific houses and along neighborhood distribution lines. The field measurements were published in the Gering Courier on February 10, 1994.

## **ALTERNATIVES INCLUDING THE PROPOSED ACTION**

---

Several actions were considered as alternatives to the proposed action including "no action", alternative electrical systems, alternative structure designs and alternative routes. These alternatives are discussed below.

### **2.1 NO ACTION ALTERNATIVE**

Under the No Action Alternative, Western would not consolidate the existing Gering-Stegall 115-kV transmission lines, and would only perform essential maintenance activities as needed. Structures and hardware would be repaired and/or replaced as required during regular maintenance operations and in response to emergency outages on the line. These repairs would have to be made with increasing frequency in the future as the line increases in age. The No Action Alternative would not eliminate ROW encroachment problems and therefore is not considered as a reasonable alternative for this project.

### **2.2 CONSERVATION OF ENERGY ALTERNATIVE**

As part of its marketing policies, Western encourages energy conservation through the promotion of efficient and economic uses of energy, and through the use of renewable resources such as hydro, wind, solar, and geothermal energy sources. However, the purpose and need for the Gering-Stegall consolidation project cannot be met by energy conservation. The purpose of this project is to eliminate maintenance problems associated with encroachments along the existing ROW. Therefore energy conservation is not considered as a reasonable alternative for this project.

### **2.3 TRANSMISSION SYSTEM ALTERNATIVES**

Transmission "system" alternatives refer to various electrical solutions to electrical problems on a given transmission system. For example, the addition of transformers to existing substations or the construction of new substations are changes considered in systems alternatives. System planning studies conducted for the project indicate there is not a

projected need for changing voltages or otherwise upgrading the Gering-Stegall transmission lines. For the Gering-Stegall Consolidation Project no systems alternatives have been identified. System changes would not resolve encroachment problems.

## **2.4 DESIGN ALTERNATIVES**

Two basic design alternatives were evaluated; underground construction and overhead construction. Underground construction would be very difficult given the technical difficulty and expense of burying two large 115-kV transmission lines. Several design alternatives were evaluated for overhead construction, including single and double circuit designs. Because of the space constraints of the various routes and the overall goal of reducing the number of residences affected by the line, a double-circuit design was selected for overhead construction.

### **2.4.1 Underground Construction**

Underground construction is used primarily with low voltage distribution lines. With low voltage lines, insulating each phase conductor and dissipating the heat from the conductor can be accomplished with relative ease. With lines of greater voltage, such as a 115-kV line, these problems are more difficult and costly to overcome.

Construction of an underground transmission line requires a continuous zone of disturbance approximately 2 feet wide and 3 to 5 feet deep. If a high-pressure oil-filled type cable system is used, above ground, pumping and pressurizing facilities would be required. Large overhead structures are required where a transition is made between overhead and underground transmission lines.

One reason for public interest in underground lines is the perception that it radically reduces the electric and magnetic fields (EMF) generated by the lines, and thus reduces the possibility of risks to health from them. In fact, while electric fields are eliminated, the range of magnetic field strengths from different types of underground lines can vary from negligible to more than the field strength from the same line built overhead. It should also be noted that a person standing in the center of the ROW is closer to an underground line than to an overhead line and their associated magnetic fields. Underground lines do significantly

decrease visual impacts and eliminate the risk of bird collisions with overhead ground wires. These benefits must be evaluated in the context of the project environment and compared to the economic costs.

Underground construction of a 115-kV transmission line can cost five to ten times more per mile than a new 115-kV transmission line installed overhead. The cost of underground construction ranges from 5 to 17 times more than the cost of constructing an overhead system, depending on the voltage and the technology used (Power Engineers Incorporated 1988).

The reliability of overhead and underground lines are probably comparable. While underground lines are immune to the effects of weather, they are susceptible to damage from geologic or subsoil instabilities and to mechanical failure of their cooling systems. A failure in an underground system often results in a power outage of several days or even weeks, since line failures are difficult to locate and repair. In contrast, overhead line outages can often be repaired within hours. Underground lines are expected to have a shorter service life than equivalent overhead lines; 25-30 years versus 40-50 years. For these reasons, Western does not consider undergrounding a viable alternative for this project.

#### **2.4.2 Overhead Construction**

Overhead construction is the conventional method for double circuiting higher voltage transmission lines. Several options were evaluated for overhead construction including various routes and structure designs.

### **2.5 ROUTING ALTERNATIVES**

#### **2.5.1 Initial Route Alternatives**

A route selection process was used to identify and evaluate potential routes for the new Gering-Stegall double-circuit transmission line. This process involved several steps:

- Collection of data on environmental and human resources
- Mapping of environmental and human resources

- Identification of exclusion, avoidance, and opportunity areas for transmission line siting, based on resource sensitivity
- Evaluation of potential routes
- Selection of routes to be carried forward for full analysis in the EA
- Presentation of the results in a public meeting

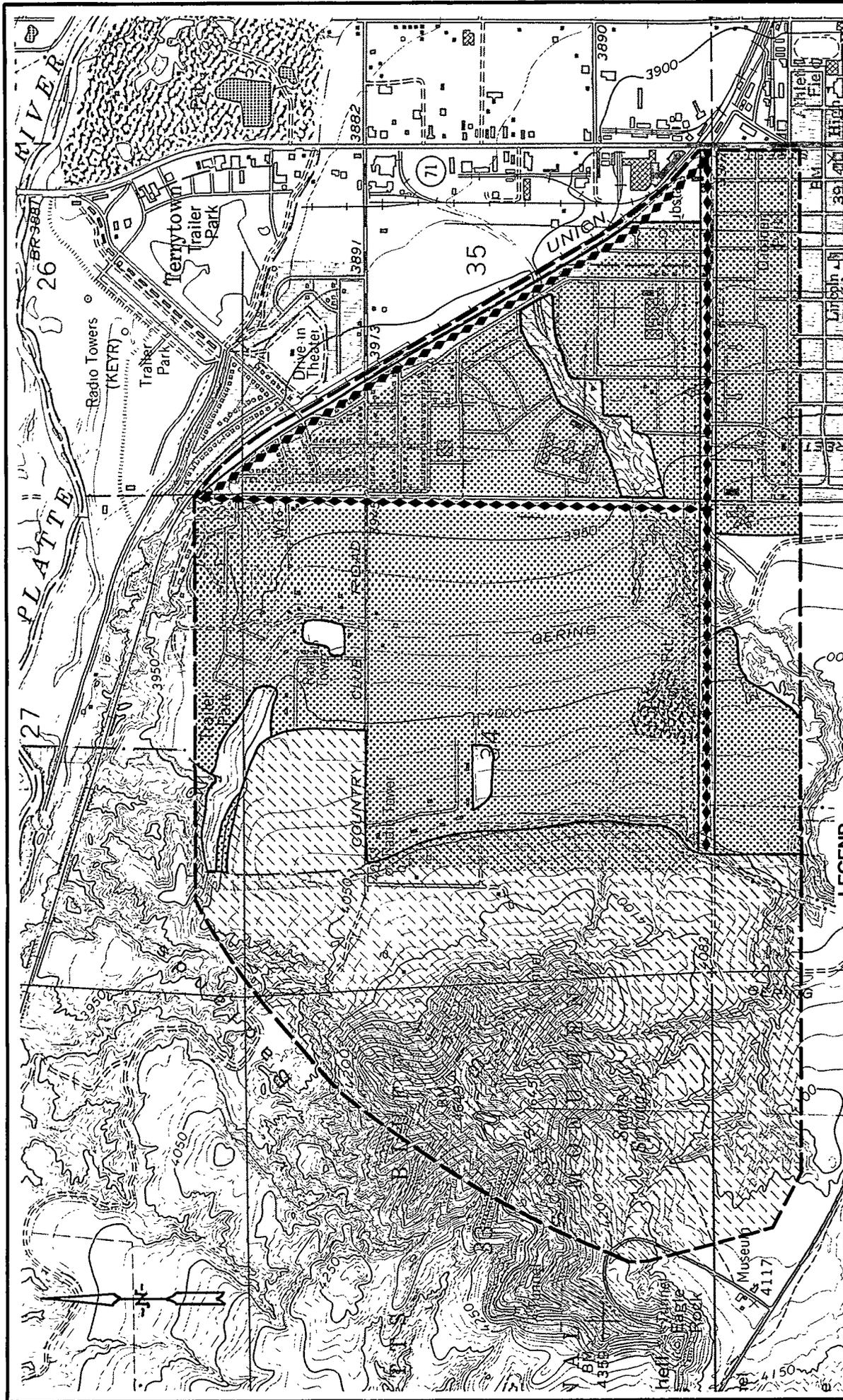
Information on environmental resources within the study area was collected from existing published and unpublished documents and files, contacts with governmental agencies, review of aerial photography, and a field reconnaissance. Resource maps were then prepared, based on field observations and collected data. Maps were prepared for resources that were capable of being mapped, which represented exclusion, avoidance or opportunity for transmission line siting.

A composite map of resource sensitivity was then prepared (Figure 2-1). Resources were mapped as exclusion, avoidance or opportunity, based on Western Area Power Administration policies and resource sensitivity (Table 2-1). Exclusion areas are those excluded from consideration of a route for a transmission facility, because of their high sensitivity and the likelihood of unacceptable and unavoidable adverse impacts. Avoidance areas are those which would not be considered for routing unless there is no reasonable alternative. Opportunity areas are those where there are existing conditions favoring construction of a transmission line.

Several potential alternative routes were identified based on review of aerial photography and field reconnaissance. These were then compared to the map of exclusion, avoidance and opportunity areas. All except one of the routes had significant problems which resulted in them not being carried forward for full analysis in the EA. Each of these routes is described below, along with their advantages and disadvantages.

#### North Side of U Street Alternative

This route followed the existing Archer-Gering transmission line route along the north side of U Street. Its advantages included the following:



LEGEND

NO CONSTRAINTS OR OPPORTUNITIES



EXCLUSION AREA



AVOIDANCE AREA



OPPORTUNITY AREA



EXCLUSION, AVOIDANCE AND OPPORTUNITY AREAS

GERING-STEGALL TRANSMISSION LINE

FIG. 2-1

**TABLE 2-1**

**EXCLUSION, AVOIDANCE AND OPPORTUNITY AREAS USED IN  
THE TRANSMISSION LINE ROUTE SELECTION PROCESS**

---

**EXCLUSION AREAS**

- Placement of a new transmission line over existing housing.
- Designated or registered national parks, memorial parks, historic sites and landmarks; natural landmarks, monuments, and wilderness areas
- Designated or registered state parks, historic sites, monuments, historical markers, archeological sites, and nature preserves.
- County parks and recreational areas, municipal parks, and parks owned or administered by other governmental subdivisions.
- Areas critical to the lifestages of threatened or endangered animal or plant species
- Areas where animal or plant species that are unique or rare to Nebraska would be irreversibly damaged.

**AVOIDANCE AREAS**

- Existing or planned urban land uses, including residential, commercial and industrial areas.
- Occupied dwellings, and impacts to landscaping and home improvements.
- Incompatible land uses including landfills, road or street expansions, mines and gravel pits.
- Designated or registered national historic districts; wildlife areas; wild, scenic or recreational rivers; wildlife refuges; and grasslands.
- Designated or registered state wild scenic or recreational rivers; game refuges; game management areas; management areas; forests, forest management lands; and grasslands.
- Properties eligible for listing on the National Register of Historic Properties.

**TABLE 2-1  
(Concluded)**

- 
- Woodlands and wooded areas.
  - Open space, shelterbelts, riparian areas, and other areas of conservation, recreational or ecological importance.
  - Floodplains.
  - Areas which are geologically unstable or highly erosive.
  - Areas of recreational significance which are not designated as exclusion zones.
  - Reservoirs and municipal water supplies.
  - Water sources for organized rural water districts.
  - Irrigated land, where the project would interfere with irrigation.
  - Prime and unique farmlands.

**OPPORTUNITY AREAS**

- Existing utility rights-of-way
  - Along streets and property lines.
-

- Located in an existing Western ROW, and along a major street.
- About one-third of the route through the Gering urban area would be through a high school parking lot.
- Groups of houses and their landscaping, the landfill, and other obstacles could be spanned, with structures being locatable on street corners, parking lots, and vacant land.
- Did not cross over any houses.
- Shortest distance between the Gering substation and the western end of the transmission line structure.

This route does cross several avoidance areas, including residential areas, a landfill, and a minor area of gullied land. It would cross the property boundaries (but not the buildings) of nine residences, a church, a school, and one commercial property and be viewed by about 30 residences on the south side of U Street. However, it had fewer disadvantages than other alternative routes. It was carried forward for full evaluation in the EA, as the proposed action.

#### South Side of U Street Alternative

This alternative route was similar to the North side of U street. It would cross to the south side of U Street near the substation, and then proceed west along the south side of the street, and re-cross to the north side of the street near the west end of U Street. It has the following advantages:

- Would be located along a street, and within or parallel to existing utility line rights-of-way (ROW)
- Almost as short as the North Side of U Street alternative
- Would avoid the landfill and small area of gullied land west of Gering.

However, it has more disadvantages than the North Side of U Street alternative. It would be located adjacent to 26 residences and a medical center (as opposed to 9 houses and a church and a school for the North Side of U Street alternative). There are much fewer opportunities for spanning groups of properties to minimize impacts. It would not be within an existing Western utility ROW. It would be very difficult to build because of existing utility line

congestion on the south side of U Street. Because of the difficulties and expense involved with construction, it was considered to not be feasible from an engineering viewpoint, and the South Side of U Street alternative was not carried forward for further analysis in the EA.

#### North of High School Alternative

This alternative route was developed to reduce the number of residences adjacent to the transmission line. It would go northwest from the substation along the railroad tracks, cross some residences, and go west along the north side of the high school athletic field. It would then continue west through an area of vacant land and open space to Highway 71, and then southwest through agricultural and vacant land back to U Street.

After a field reconnaissance of this route, it was found to be unacceptable for several reasons:

- It would cross over two houses, which violates Western policy of not constructing new transmission lines over existing houses.
- There are existing utility lines along the north side of the high school athletic field. Therefore the new line would have structures placed within the field, which could interfere with athletic and recreational use.
- The vacant land west of the athletic field is a historic brick yard, and construction in this area would entail a full archaeological and historic survey of the entire property.
- West of the brick yard, the alternative would pass through a small area of open space which is owned by the City of Gering and which is currently being developed into a park.
- West of Highway 71, a new subdivision is being developed in agricultural land, and the landfill is being expanded. Avoidance of these areas would increase the length of the route.

This alternative was rejected because it would cross several exclusion areas, and was not carried forward in the EA.

### Park Alternative

This alternative was also developed to reduce the number of residences adjacent to the route. It would also proceed northwest along the railroad tracks, and then go west through a developed park and a park under development. The nature of these areas was not initially apparent from aerial photography. It was rejected from further consideration during the field reconnaissance because it would cross Northfield Park and an adjacent park under development.

One additional routing alternative was developed as a result of the February 3, 1994 public meeting, and is described below.

### **2.5.2 Railroad Right-of-Way to Highway 71 Alternative**

This alternative was suggested by the public at the February 3, 1994 public meeting. This alternative would go northwest from the Gering Substation along the Burlington-Northern Railroad ROW until it met Highway 71. It would then follow Highway 71 south until it reached the existing Archer-Gering ROW (Figure 2-2). Departing from the existing ROW at any point further west than Highway 71 would route the transmission line across the Scotts Bluff National Monument (an exclusion area), or would route it along the base of the monument in the viewsheds of the park and across land parcels slated for future residential development.

Since Western recently rebuilt the Limestone-Gering-McGrew 69-kV transmission line along the north side of the railroad ROW, only the south side of the ROW would provide adequate clearance for the Gering-Stegall double circuit transmission line. Currently there is a distribution line along this route that would have to be relocated.

The proposed action is approximately 7,000 feet long while this alternative would be 15,500 feet in length. This alternative would double the length of the project with approximately 3500 feet along U-Street, 5800 feet along Highway 71 and another 6200 feet along the railroad ROW. The doubling in distance would result in an estimated addition of 12-15 transmission line structures and \$650,000 in materials and additional ROW costs.



This alternative would also affect several homes whose backyards are adjacent to Highway 71 and the railroad ROW. Approximately 85 to 100 homes would be affected by this route compared to about 40 homes for the proposed route along both sides of U Street. The transmission line would also affect visual quality along Highway 71 and would be viewed by more traffic than the route along U Street.

This route would be visible from Scotts Bluff National Monument and since it would have more structures oriented in a north-south direction, it may be more visible from the Monument overlooks. In addition, the transmission line might impact views of the monument from town along Highway 71 and from homes along Highway 71.

Based on the route affecting an additional 72 homes, potential adverse impacts to the Scotts Bluff National Monument viewshed, and visual impacts along Highway 71, Western has determined that the results of a cost-benefit analysis for this route do not make it a viable alternative.

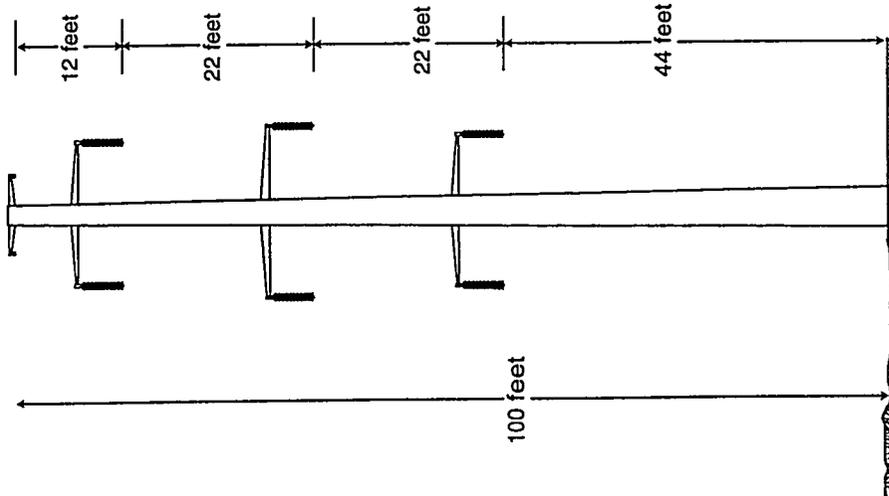
In summary, the only one of the routing alternatives carried forward for full analysis in the EA was the North Side of U Street, which is the proposed action.

## **2.6 STRUCTURE TYPE ALTERNATIVES**

For a double circuit 115-kV transmission line, only tubular steel and steel lattice are practical transmission line structure options. Wood pole H-frame design is not well suited for use as a double circuit. Given the space constraints presented along the preferred route, only tubular steel was seriously considered as an option. Tubular steel would present the least intrusion both visually and spatially. Two structure configurations are being considered, the "parallel crossarm" (Options A and B), and the "post insulator" configuration (Options C and D). These structure types are illustrated in Figure 2-3. Options A and B are both "parallel crossarm" configurations. Options A and B use the same structure design, but Option B proposes inverse phasing of the conductors. Option C is the "post insulator" configuration and Option D is the "strut insulator" configuration.

The post insulator or strut insulator design is the preferred design because it requires less electrical clearance than the parallel crossarm design and therefore requires less ROW (52

GERING-STEGALL  
NORTH 115-kV

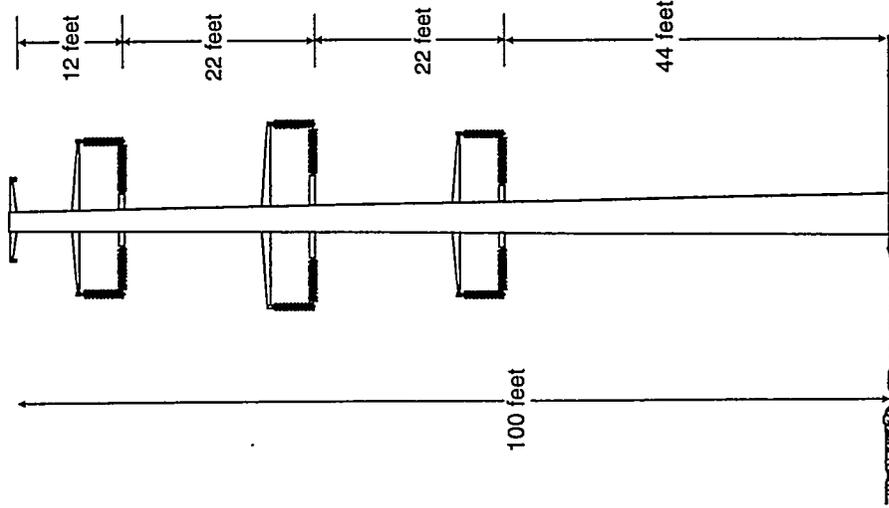


40'

80 foot  
ROW

DOUBLE CIRCUIT WITH  
PARALLEL CROSSARMS  
OPTIONS A & B

GERING-STEGALL  
NORTH 115-kV

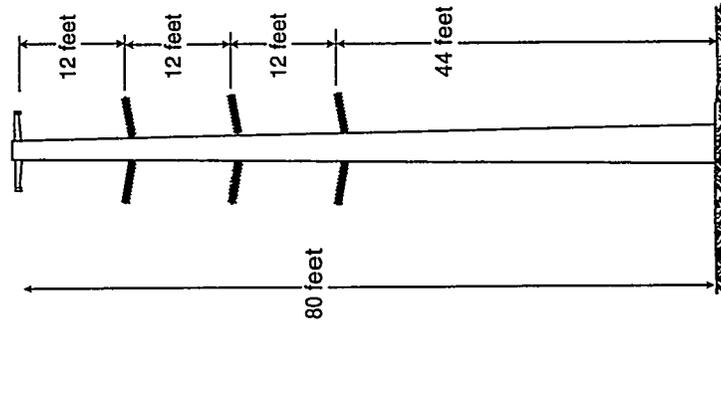


26'

52 foot  
ROW

DOUBLE CIRCUIT WITH  
STRUT INSULATORS  
OPTION D

GERING-STEGALL  
NORTH 115-kV

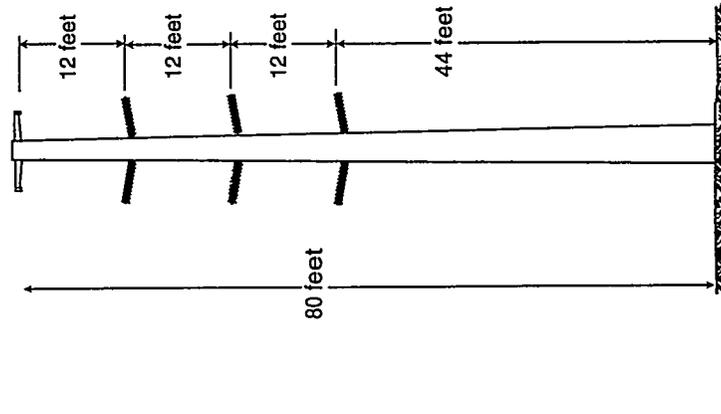


26'

52 foot  
ROW

DOUBLE CIRCUIT WITH  
POST INSULATORS  
OPTION C

GERING-STEGALL  
SOUTH 115-kV



26'

52 foot  
ROW

DOUBLE CIRCUIT WITH  
POST INSULATORS  
OPTION C

FIGURE 2-3  
STRUCTURE TYPES

feet compared to 80 feet). None of the alternative structure types or ROW widths would involve placement of conductors over existing houses. The different ROW widths are needed in part to allow for lateral sway of the conductor; the post insulator and strut insulator structures have less lateral sway.

Structure color was evaluated as part of the visual analysis done for this project. Galvanized steel (non-reflective, weathers dull gray with time) and weathering steel (oxidized steel, dark rust in color; e.g., "CORTEN" trade name) were used in several computer simulations done for the project (see Appendix F). Based on these analyses, galvanized steel was selected because it was the least intrusive color for visual impacts.

Special transition structures would be necessary where the new double circuit reconnects to the existing Gering-Stegall South and Gering-Stegall North transmission lines west of town. The double circuit must split and reconnect to the two separate wood pole H-frame transmission lines and ROW. This transition would occur 1.3 miles west of the Gering Substation. At this location two different types of structures are being considered; first a shorter thick-steel angle structure or alternatively two single-pole steel structures. Both structures were considered in the visual analysis done for the project (see Appendix F). The two pole alternative is preferred for engineering reasons, and because it would have lower visual impacts.

## **2.7 CONDUCTOR PHASING ALTERNATIVES**

Two alternative configurations were evaluated for conductor phasing. Conductor phasing refers to the orientation of the three phase conductors (wires) on the structures. Inverse phasing, which reverses the orientation of the conductors periodically, was compared to conventional orientation relative to predicted electromagnetic field effects. On a double circuit, inverse phasing can lower the expected electric and magnetic fields. See Section 4.1.2, Tables 4-1 and 4-2 for calculated electric and magnetic fields for this project. Inverse phasing is included as part of the proposed action.

## **2.8 PROPOSED ACTION**

Western proposes to consolidate 1.33 miles of the Gering-Stegall North and South 115-kV transmission lines by rebuilding the lines onto double circuit single pole steel structures. A 1.33-mile segment of the Archer-Gering 115-kV transmission line, which is deenergized, would be decommissioned and removed. Table 2-2 lists typical design characteristics for the existing and proposed transmission lines.

Eleven to fourteen new double-circuit single pole steel structures would be constructed, while thirty-one existing wood pole H-frame structures would be removed by the project. The steel poles would be single tubular steel, constructed of galvanized steel, no greater than 30 inches in diameter. The average height of the structures would be 90 feet. The first structure west of the substation would be 15 feet taller (105 feet total height). The structures would have the post insulator configuration and the conductors would be oriented in inverse phasing. The average span length between transmission line structures would be 650 feet. Figure 2-4 illustrates existing conditions and the proposed action.

### **2.8.1 Right-of-Way Needs**

The Gering-Stegall double-circuit transmission line would be constructed along an alignment that is presently occupied by a de-energized transmission line. This proposed transmission line would require an easement width of 52 feet, partly overlapping U Street that runs parallel with the proposed transmission line. All easements or relocations would be in accordance with the Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) and other applicable laws and regulations governing Federal acquisition of property rights.

Landowners with occupied dwellings within the 52-foot easement for the proposed double circuit would be offered two options:

- Landowners may grant Western a new easement and accept payment for the easement based on current and comparable market values and be paid for any damages associated with construction, or

**TABLE 2-2**

**TYPICAL 115-KV TRANSMISSION LINE DESIGN  
(APPROXIMATE FIGURES)**

Description of Design Component	Existing <sup>1</sup> Single-Circuit H-Frame, Wood Pole	Proposed <sup>2</sup> Double-Circuit Single-shaft, Steel Pole
Voltage	115-kV	115-kV
ROW width		
Archer-Gering	45 feet	52 feet
Gering-Stegall South	50 feet	
Gering Stegall North	80 feet	
Span between structures (average)	600 feet	650 feet
Span between structures (maximum)	600 feet	760 feet
Total number of transmission line structures removed or constructed by the project	31 removed	11-14 constructed
Height of structure (average)	60 feet	90 feet
Height of structure (typical range)	43 to 70 feet	85 to 105 feet
Structure diameter	18 inches	24 to 30 inches
Land disturbed at structure base (temporary)	900 square feet	900 square feet
Land disturbed at structure base (permanent)	36 square feet	9 square feet
Minimum ground clearance beneath conductor (at maximum sag at 120 degrees F)	22 feet	23 feet
Maximum height of machinery that can be operated safely under line	15 feet	16 feet
Circuit configuration	horizontal	vertical
Conductor size (circular mils)	397,500	397,500

<sup>1</sup> Design characteristics for existing H-frame structures taken from the plan and profiles for each transmission line.

<sup>2</sup> The steel poles would be equipped with rigid "stand-off" insulators.

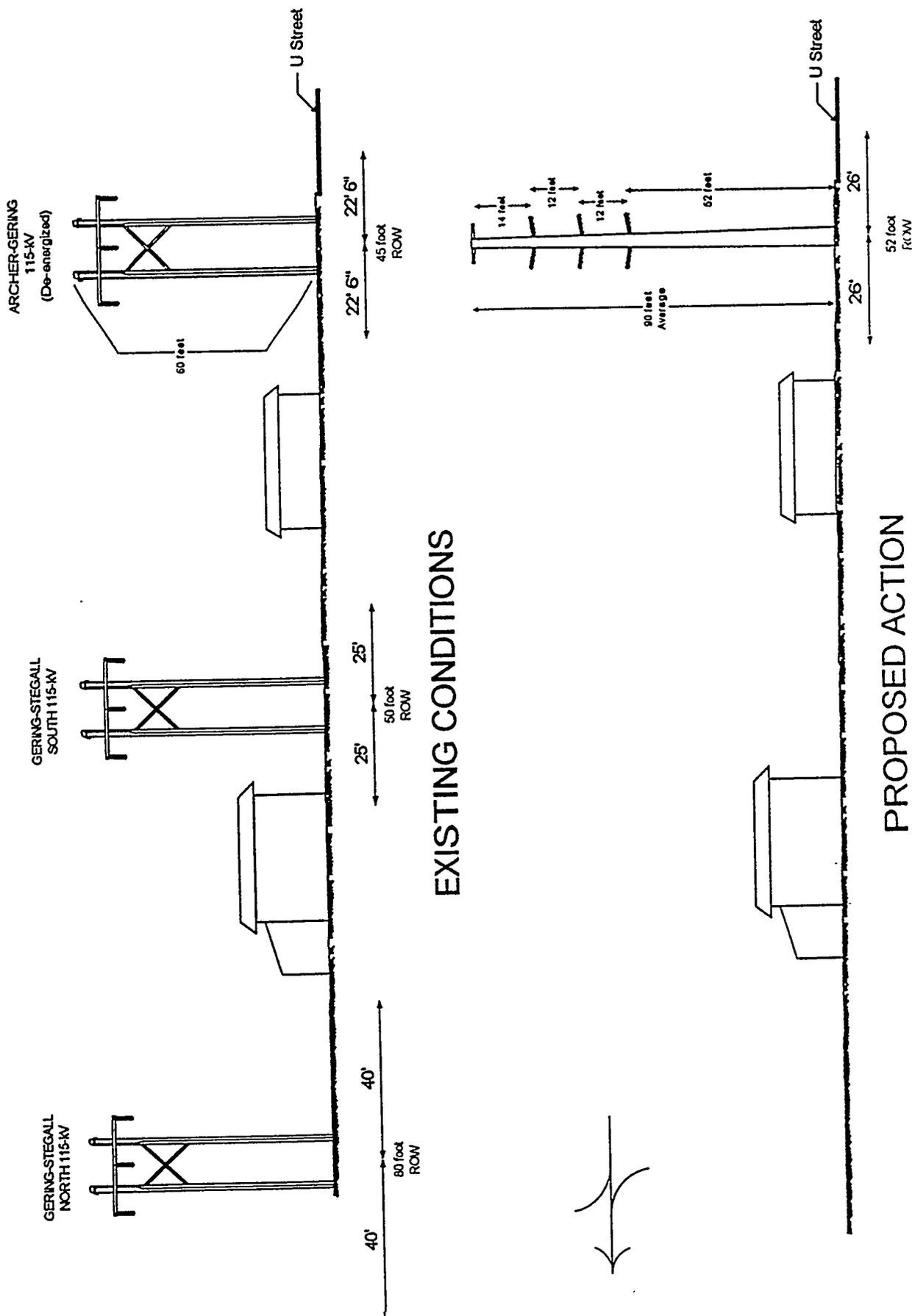


FIGURE 2-4 EXISTING AND PROPOSED TRANSMISSION LINES

- Landowners may choose to be relocated to a comparable property under the provisions of the Relocation Assistance Program. The program provides assistance for moving costs, replacement housing, rental assistance, down payments, and purchase supplements.

Western would relinquish all easement rights to landowners with property under the existing transmission lines that would be abandoned. Landowners would still be entitled to damages associated with removal of the existing transmission lines.

### **2.8.2 Construction**

Conventional transmission line construction would be used for this project. Access would be required to all existing and proposed transmission line structure locations. Western would coordinate with landowners and would provide advanced notice before construction. Table 2-3 lists personnel and equipment needed for transmission line construction. Construction would proceed in the following sequential manner:

1. Surveying. The transmission line ROW would be surveyed. The survey would locate the transmission line along the centerline, determine profiles, and locate structures.
2. Line Removal. The Archer - Gering transmission line, which is currently deenergized, would be removed first. Conductor would be wound on reels located at preselected sites, then hardware would be removed.

Existing H-frame wood pole structures from the Archer-Gering transmission line would then be removed. In some areas the poles may be cut at ground level. In other areas, such as cultivated fields, residential and commercial properties, the poles may be pulled completely out of the ground and removed. The holes would be backfilled and compacted. Some poles and conductor may be salvaged or sold by the contractor. Some poles may eventually be disposed of in approved landfills.

The Gering-Stegall North and South transmission lines would not be removed until after the new double circuit transmission line was constructed. Removal of these lines

**TABLE 2-3**

**TYPICAL PERSONNEL AND EQUIPMENT FOR  
TRANSMISSION LINE CONSTRUCTION**

Activity	Number of Persons	Equipment
Surveying	4	pickup truck
Site preparation	2	blade, pick-up truck
Construction yard preparation	2	blade, pick-up truck
Materials hauling	8-12	tractor trailer, hydrocrane, flatbed truck, pick-up truck
Foundation excavation	4-8	tractor with auger, backhoe, pickup truck
Structure assembly	6-12	hydrocrane, flatbed truck, pickup truck
Structure demolition	6-12	hydrocrane, flatbed truck, pickup truck
Structure erection	4-6	crane (50 to 100 ton capacity), pickup trucks
Groundwire and conductor stringing	5-10	reel trailer, tensioner, puller, digger, winch truck, bucket trucks, pickup truck
Cleanup	3-6	Flatbed and pickup trucks
Seeding	1-2	hydroseeder or pickup trucks

Note: Most of the activities above are expected to progress sequentially, and the peak number of people at any one time during transmission line construction is expected to be 12 to 16.

would follow the same sequence described above. For these transmission lines, Western would prepare individual pole removal plans for each structure and would review these plans with the landowners before construction.

3. **Materials Handling and Hauling.** Construction materials would be stored at a temporary staging area. The staging area would serve as a reporting location for workers, parking space for vehicles, and as a storage area for materials. Materials would be hauled to the staging area using existing roads and streets.
4. **Structure Assembly.** A truck-mounted auger would dig holes for the structures. The holes would be filled with concrete for foundations. Excess material would be spread evenly around the base or would be removed. Erection crews would then assemble new structures at individual sites, or alternatively portions of the structures may be assembled at the staging area and then hauled to the site. Insulators and hardware would be hung.
5. **Conductor Stringing.** Reels of conductor would be delivered to wire-handling sites, located at each end of the project. The conductor pulling, sagging and clipping operations would take place quickly. Tension-stringing methods, which do not allow the conductor to touch the ground, would be used. Steel-pulling cables would be pulled down the line to large pulleys hanging from the insulator attached to the structures. These pulling cables and pulleys would pull the line under tension for the entire length of the project.
6. **Cleanup and Restoration.** Old wood poles, waste construction materials and rubbish from all construction areas would be collected, hauled away, and disposed of at approved sites. All disturbed areas not returned to cultivation would be reseeded to minimize erosion. The intent would be to restore all construction areas as near as feasible to their original condition. Any damaged gates, fences, or landscaping would be repaired.

Except where clearing is required, vegetation would be protected from damage. All destruction, scarring, damage, and defacing of the landscape would be repaired. Landowners would be compensated for damage or repair.

7. **Safety Program.** Western would require the contractor to prepare and conduct a safety program (subject to Western's approval) in compliance with all applicable Federal, state, and local safety standards and requirements, and Western's general practices and policies.

Western's Standard Construction Practices are included in Table 2-4. Western will have a construction inspector onsite during all phases of construction. The construction inspector will be responsible for ensuring standard practices and specific environmental mitigation measures are implemented by the construction contractor.

### **2.8.3 Operation and Maintenance**

The day to day operation of the transmission lines would be directed by system dispatchers in power control centers. These dispatchers use communication facilities to operate circuit breakers that control the transfer of power through the lines. These circuit breakers also operate automatically to ensure safety, e.g., in the event of a structure or conductor failure.

Western's preventive maintenance program for transmission lines would include routine aerial and ground patrols. Aerial patrols would be conducted four times per year. Ground patrols would be conducted once a year to detect equipment needing repair or replacement (i.e., structures, insulators, and conductors). In addition, climbing inspections would be conducted on an on-going basis, with each structure being climbed and inspected once every 5 years.

Maintenance may include repairing damaged conductors, inspection and repair of structures, and replacing damaged and broken insulators. In addition to maintaining the structures, conductors, and ROW, Western would maintain gates installed by Western. Transmission lines are sometimes damaged by storms, floods, vandalism, or accidents and require immediate repair. Emergency repair would involve prompt movement of crews to repair the damage and replace any equipment. If access roads are damaged as a result of the repair activities, Western would repair them as required.

Various practices may be used at structures and along the transmission line ROW to prevent undesirable vegetation. Because of the semiarid, urban and agricultural nature of the project area, very minor and infrequent measures would be necessary to control vegetation.

**TABLE 2-4**

**STANDARD CONSTRUCTION PRACTICES**

---

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1. The contractor shall limit the movement of crews and equipment to the ROW, including access routes. The contractor shall limit movement on the ROW to minimize damage to residential yards, grazing land, crops, orchards, and property, and shall avoid marring the lands. The contractor shall coordinate with the landowners to avoid impacting the normal function of irrigation devices during project construction and operation.
2. When weather and ground conditions permit, the contractor shall obliterate all construction caused deep ruts that are hazardous to farming operations and to movement of equipment. Such ruts shall be leveled, filled and graded, or otherwise eliminated in an approved manner. Ruts, scars, and compacted soils in hay meadows, alfalfa fields, pastures, and cultivated productive lands shall have the soil loosened and leveled by scarifying, harrowing, discing, or other approved methods. Damage to ditches, tile drains, terraces, roads, and other features of the land shall be corrected. At the end of each construction season and before final acceptance of the work in these agricultural areas, all ruts shall be obliterated, and all trails and areas that are hard-packed as a result of construction operations shall be loosened and leveled. The land and facilities shall be restored as nearly as practicable to the original condition.
3. Water turnoff bars or small terraces shall be constructed across all ROW trails on hillsides to prevent water erosion and to facilitate natural revegetation on the trails.
4. The contractor shall comply with all Federal, state, and local environmental laws, orders and regulations. Prior to construction, all supervisory construction personnel will be instructed on the protection of cultural and ecological resources. To assist in this effort, the construction contract will address: a) Federal and state laws regarding antiquities and plants and wildlife, including collection and removal; and b) the importance of these resources and the purpose and necessity of protecting them.
5. The contractor shall exercise care to preserve the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work. Except where clearing is required for permanent works, approved construction roads, or excavation operations, vegetation shall be preserved and shall be protected from damage by the contractor's construction operations and equipment.
6. On completion of the work, all work areas except access trails shall be scarified or left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion. All destruction, scarring, damage, or defacing of the landscape resulting from the contractor's operations shall be repaired by the contractor.

**TABLE 2-4  
(Continued)**

- 
7. Construction trails not required for maintenance access shall be restored to the original contour and made impassable to vehicular traffic. The surfaces of such construction trails shall be scarified as needed to provide a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.
  8. Construction staging areas shall be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent. On abandonment, all storage and construction materials and debris shall be removed from the site. The area shall be regraded, as required, so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.
  9. Borrow pits shall be so excavated that water will not collect and stand therein. Before being abandoned, the sides of borrow pits shall be brought to stable slopes, with slope intersections shaped to carry the natural contour of adjacent, undisturbed terrain into the pit or borrow area, giving a natural appearance. Waste piles shall be shaped to provide a natural appearance.
  10. Construction activities shall be performed by methods that prevent entrance or accidental spillage of solid matter, contaminants, debris, and other objectionable pollutants and wastes into flowing streams or dry water courses, lakes, and underground water sources. Such pollutants and wastes include, but are not restricted to, refuse, garbage, cement, concrete, sanitary waste, industrial waste, radioactive substances, oil and other petroleum products, aggregate processing tailings, mineral salts, and thermal pollution.
  11. Dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or water courses will not be performed without prior approval from appropriate state agencies.
  12. Excavated material or other construction materials shall not be stockpiled or deposited near or on stream banks, lake shorelines, or other water course perimeters where they can be washed away by high water or storm runoff or can in any way encroach upon the actual water source itself.
  13. Waste waters from construction operations shall not enter streams, water courses, or other surface waters without use of such turbidity control methods as settling ponds, gravel-filter entrapment dikes, approved flocculating processes that are not harmful to fish, recirculation systems for washing of aggregates, or other approved methods. Any such waste waters discharged into surface waters shall be essentially free to settleable material. Settleable material is defined as that material that will settle from the water by gravity during a 1-hour quiescent period.

**TABLE 2-4  
(Concluded)**

- 
14. The contractor shall utilize such practicable methods and devices as are reasonably available to control, prevent, and otherwise minimize atmospheric emissions or discharges of air contaminants.
  15. Equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments, or other inefficient operating conditions, shall not be operated until corrective repairs or adjustments are made.
  16. Burning or burying of waste materials on the ROW or at the construction site will not be allowed. The contractor shall remove all waste materials from the construction area. All materials resulting from the contractor's clearing operations shall be removed from the ROW.
  17. The contractor shall make all necessary provisions in conformance with safety requirements for maintaining the flow of public traffic and shall conduct his construction operations so as to offer the least possible obstruction and inconvenience to public traffic.
  18. Western will apply necessary mitigation to eliminate problems of induced currents and voltages onto conductive objects sharing a ROW, to the mutual satisfaction of the parties involved. Western will install fence grounds on all fences that cross or are parallel to the proposed line.
  19. The contractor will span riparian areas located along the ROW and avoid physical disturbance to riparian vegetation. Equipment and vehicles will not cross riparian areas on the ROW during construction and operation activities. Existing bridges or fords will be used to access the ROW on either side of riparian areas.
-

Herbicides would not normally be used within the transmission line ROW unless requested by the landowner for the purposes of reducing noxious weeds around transmission line structures.

#### **2.8.4 Abandonment**

At the end of the useful life of the proposed project, the transmission lines would either be replaced or removed. In either case, the ground wires, conductors, insulators, and hardware would be dismantled and removed from the ROW. The structures would be removed along with any concrete foundations. Areas disturbed during the dismantling process would be regraded and reseeded.

#### **2.8.5 Schedule**

The project is scheduled for construction in 1996. The following project schedule outlines major project milestones:

- Conduct Public Meeting/Workshop -- Winter 94
- Issue Environmental Assessment for State review -- Spring 1995
- Complete Final Design -- Spring 1995
- Select Construction Contractor -- Winter 1995
- Complete Construction -- Fall 1996

### **2.9 COMPARISON OF ALTERNATIVES**

The proposed action would have minor effects on land use during construction, and is designed to reduce the occurrence of incompatible land uses during operation, compared to the existing situation. It would have moderately positive visual effects by reducing the number of vertical line contrasts (i.e., vertical structures) and consolidating them in fewer, but larger structures. It would produce electric and magnetic fields, but these would be reduced from existing conditions by use of inverse phasing. Electric effects are not anticipated to adversely affect public health or public safety. Most other resources would either have no adverse effects, or undetectable effects.

Below, the effects of each of the alternatives is compared to the proposed action:

No Action Alternative and Conservation of Energy: These alternatives would not meet the purpose and need for the project.

Routing Alternatives: Five different alternative routes were examined. These alternatives are described in Section 2.5. Routing along the north side of U Street (the proposed action) was considered to be the only viable alternative route.

Structure color alternative: Use of weathering steel would result in increased visibility of the structures when viewed with the sun shining directly on the structures, i.e., when viewed from the south, from the east in the morning, or from the west in the afternoon. Views of the structures under other conditions would have a similar visibility and visual contrast as with the proposed action. The increased contrast is likely to be most apparent in the urbanized portions of the route. Views of Scotts Bluff from the west side of town might be slightly improved with weathering steel structures because the brown poles may blend into the background better. However, the use of galvanized steel (the proposed action) would have fewer overall impacts to visual quality.

Structure design alternative: The alternative parallel crossarm design would require 80 feet of ROW, as compared to 52 feet for the proposed action. This would result in a greater occurrence of incompatible land uses within the ROW (residential yards and landscaping, church and school properties, and the landfill). A larger area may be affected during routine or emergency maintenance activities. It may have greater visual impacts because of this wider silhouette. It would also cost more to acquire the ROW.

Transition structure design alternatives: The transition structure 1.3 miles from the Gering Substation may utilize either a single pole or a double pole design. Western has not identified a preferred transition structure design. The visual resource analysis indicated that the double pole alternative would be slightly less noticeable from viewpoints on Scotts Bluff, because the two pole design would use narrower poles.

Conventional phasing alternative: Western's preferred action involves use of inverse phasing. Conventional phasing would result in higher electric and magnetic fields.

**AFFECTED ENVIRONMENT**

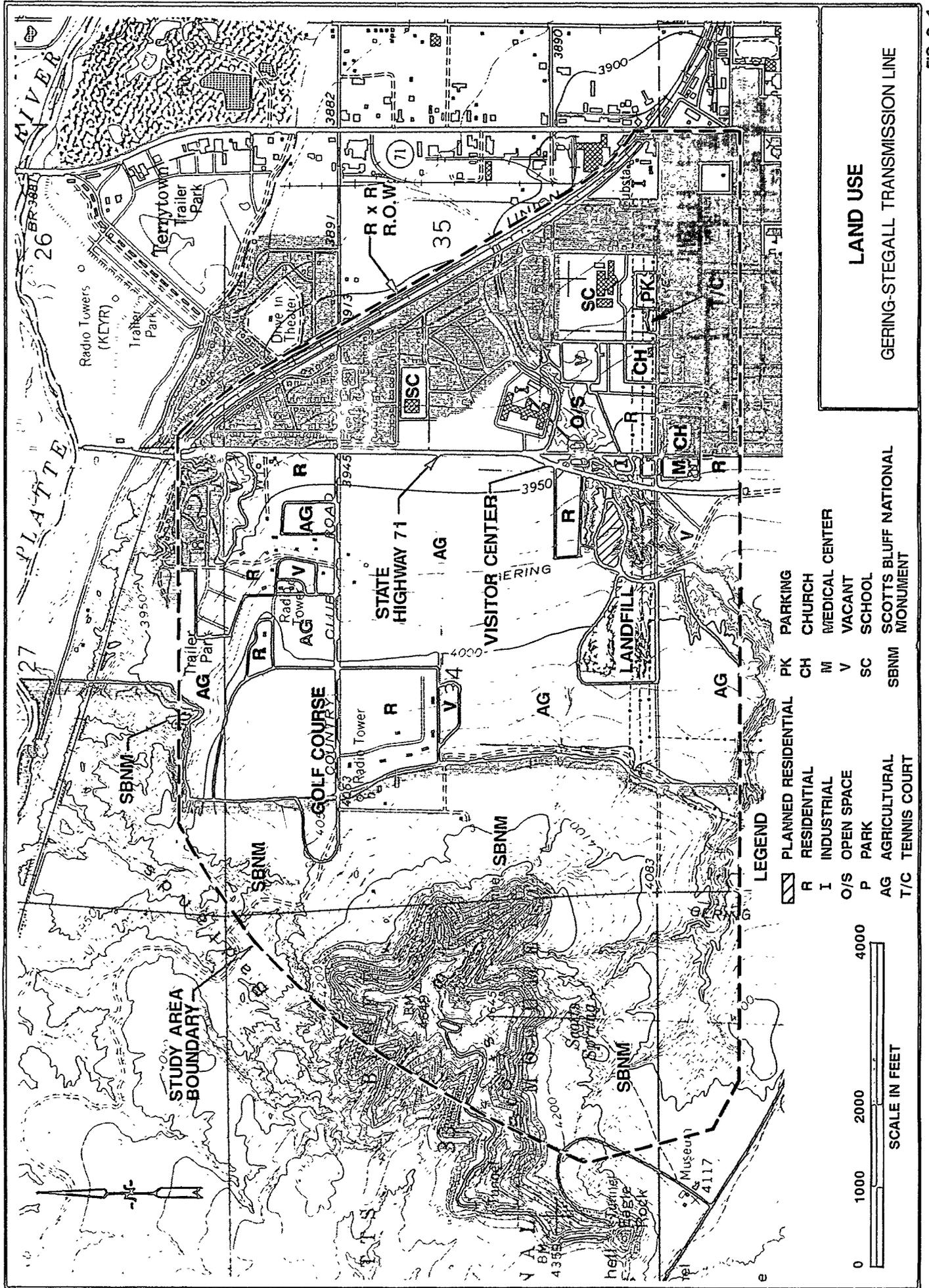
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This chapter presents a description of the study area's environmental conditions that could be affected by (or inversely, affect) transmission line decommissioning and new line construction and operation. The development and siting of project alternatives was based on all information compiled for the Affected Environment.

**3.1 STUDY AREA DEFINITION AND DESCRIPTION**

The study area is comprised of approximately 2.25 square miles (1550 acres) of lands inclusive of portions the City of Gering, Nebraska, Scotts Bluff National Monument, and mostly agricultural lands situated between the city and the monument (Figure 3-1). The study area size and boundaries were selected to include potential alternative routes through the City of Gering, and to include the portions of Scotts Bluff National Monument which might be affected by visual or other impacts. It only extends about two blocks south of U Street, because the area south of U Street within the City of Gering is heavily residential and not suitable for transmission line siting. The study area extends north to the junction of the railroad tracks and Highway 71, in order to evaluate the Highway 71 to Railroad Alternative and other potential alternatives through open space north of U Street.

In general, three basic environmental situations predominate within the study area. Lands of the National Park Service's Scotts Bluff National Monument occupy the western one-third of the study area; these lands are mostly undisturbed and contain scenic steep and rugged terrain (bluffs) and adjacent plains areas which are mostly protected from development. The central one-third is comprised of mostly agricultural lands, vacant lands mostly associated with an incised drainage, and a municipal landfill. Urban areas including residential areas, industrial sites, schools, and churches dominate the eastern one-third of the study area. Three existing parallel 115-kV transmission lines cross the southern portion of the study area: Gering-Stegall North 115-kV, Gering-Stegall South 115-kV, and Archer-Gering 115-kV (deenergized).



**LAND USE**

GERING-STEGALL TRANSMISSION LINE

- LEGEND**
- PLANNED RESIDENTIAL
  - RESIDENTIAL
  - INDUSTRIAL
  - OPEN SPACE
  - PARK
  - AGRICULTURAL
  - TENNIS COURT
  - PARKING
  - CHURCH
  - MEDICAL CENTER
  - VACANT
  - SCHOOL
  - SCOTTS BLUFF NATIONAL MONUMENT



FIG. 3-1

### **3.2 ENVIRONMENTAL RESOURCES AND CONDITIONS**

The description of the affected environment is organized into the following categories:

- Human Resources/Conditions
- Biological Resources
- Earth Resources

Human resources/conditions assessed for impacts from transmission line decommissioning and new line construction and operation include existing and planned land use, electrical characteristics (EMF) and public safety, socioeconomics, cultural resources, and visual resources. Biological resources analyzed include threatened and endangered (T&E) species and wetlands/important habitats. Earth resources evaluated include water resources, floodplains, and soils.

The agencies that were consulted during the collection of data are listed in Section 5.1. Publications and other sources of information used in preparation of this EA are presented in Section 7.0, Literature Cited. Additional references on EMF are provided in Appendix A.

Environmental information was mapped at a scale of 1 inch equals 1,540 feet. The base map was derived from the USGS 1:24,000 scale (1 inch equals 2,000 feet) topographic 7.5 minute series quadrangle, Scotts Bluff South (1963).

Limited field checking for biological resources and land use conditions were conducted as part of the analysis process.

### **3.3 RESOURCES IDENTIFIED AS NOT REQUIRING DETAILED STUDY**

Other environmental resource areas that were considered, but which are not described in detail in this analysis, include the following:

- Air Quality - The project would have very minor, local, short-term effects on air quality, limited primarily to short-term emissions from construction vehicles and fugitive dust generated by construction activities. The consolidation of transmission lines would have no measurable effects on ozone levels.
- Climate - The project would have no effect on climate.
- Groundwater - The project would have no effect on groundwater.
- Vegetation - The project is primarily within an urban and agricultural area and therefore would have little effect on natural vegetation. Probably only two of the structures would be placed in an area of more-or-less natural vegetation, and the area of direct impact would be less than 0.05 acre. The other structures would be in urban or agricultural land.
- Wildlife - Since the project is primarily within urban or agricultural land, there is little wildlife habitat. Impacts to wildlife are therefore expected to be minimal because of the small area affected and because of the amount of human activity already present. Impacts to threatened and endangered wildlife, however, are addressed in this EA.
- Geology - The project would have no effect on geology and there are no geologic hazards present which would have an effect on the project.
- Paleontology - The project would have minimal effect on paleontological resources. Potentially important fossil bearing locales are not present along the route of the proposed action, although they are present in nearby Scotts Bluff National Monument (DOE 1991).

## 3.4 HUMAN RESOURCES/CONDITIONS

### 3.4.1 Land Use

#### 3.4.1.1 Existing Land Use

Current land uses in the study area are mostly comprised of residential, institutional, industrial, recreation and open space, agriculture, and national monument (Figure 3-1). These land uses are sensitive to the construction and operation of a transmission line. Minor areas are vacant. Descriptions of the current important sensitive land uses in the study area follow below:

Residential areas of moderate to high density occupy much of the eastern third of the study area within and adjacent to the city limits of Gering. Most residences are east of State Highway 71. The study area is comprised of approximately 20 percent residential lands.

Institutional land uses within the study area consist of a school, two churches, a medical center, and visitors center (next to Highway 71). Again, the locations of these facilities are in the eastern third of the study area. Institutional land uses represent approximately 15 percent of the study area.

Industrial land uses within the study area consist of the major substation, where the proposed changes to the transmission line system begin, a smaller substation, the Gering City landfill, and a private construction yard. All are located in the eastern third of the study area with the exception of the landfill, which is located in the central third of the study area. Industrial lands represent only about 3 percent of the study area.

Recreational areas within the study area include a municipal golf course, tennis courts and Northfield Park within the City of Gering. They also include a ravine area west of Northfield Park which is owned by the City of Gering and under development as a natural area/park (Baird 1993). Recreational areas comprise roughly 7 percent of the study area.

Scotts Bluff National Monument occupies the western third of the study area and covers about 35 percent of the area.

Agricultural land occupies most of the middle third (about 30%) of the study area. Nearly all of it is prime farmland and irrigated.

The City of Gering and Scotts Bluff County do not have any specific policies or regulations for siting of transmission lines. The City of Gering does not have a recent comprehensive plan (Baird 1993).

#### **3.4.1.2 Planned Land Uses**

Based on review of available planning and the local zoning map, as well as interviews of local officials and field observations, some new residential development is likely to occur in the central third of the study area to the east of the Scotts Bluff National Monument Visitor Center and to the north of U Street and the existing transmission lines. Twenty-seven homes are planned as part of the Canyon View Estates development. The existing City of Gering landfill is expanding to the north within its existing permitted area, and will increase in size about 2 times to 36 acres. No other planned developments or changes to existing land uses were identified along the transmission line corridor.

#### **3.4.2 Public Health and Safety and Electrical Effects**

Western Area Power Administration (Western) is committed to programs and policies that ensure a safe and healthy environment. At Western safety and health are an essential part of the working culture and are demonstrated daily in everyday work practices. Western is concerned with both the health of its employees and of the general public. This section discusses electrical properties of transmission lines and the possible effects on public health and safety. It includes discussions of potential shock hazards, defines electrical parameters affecting radio and television interference, presents tables on the electrical characteristics of the existing Gering-Stegall transmission lines, and discusses what is known about biological and human health effects associated with electric and magnetic fields or "EMF".

### **3.4.2.1 Shock Hazard**

By far, the greatest hazard from transmission lines is direct contact with the conductors. Powerlines, as with residential electrical wiring, can cause serious electric shocks if precautions are not taken to minimize shock hazard. All of Western's lines are designed and constructed in accordance with the National Electrical Safety Code (NESC) standards. NESC specifies the minimum allowable distance between the lines and the ground or other objects. These requirements determine the edge of the right-of-way (ROW), the height of the line, and the closest point to the line that buildings and vehicles can safely be allowed.

Still, extreme caution must be taken when operating tall equipment, such as cranes, drilling equipment or when moving irrigation pipe near a line. Vehicles and large equipment up to 15 feet in height, including antennas, can normally travel safely under Western transmission lines. Trees adjacent to transmission lines should not be felled on to the lines. Kites should not be flown near transmission lines and only nonmetallic string should be used. Western provides a free booklet for people living near transmission lines entitled "Living and Working Around High Voltage Power Lines". This booklet is available from the Loveland Area Office (1-800-472-2306).

Irrigation systems can be operated safely near transmission lines given certain precautions. Irrigation equipment should not be raised to a vertical position anywhere near a transmission line since irrigation pipe is often long enough to reach within flashover distance of the conductors. Steady streams of water contacting the conductor can provide a direct path to ground for leakage current or flashover. Therefore irrigation nozzle risers should be equipped with spoilers and automatic shutoffs. Magnetically induced voltages can occur on long sections of irrigation pipe; maintenance of long pipe systems should be done perpendicular to the transmission line and the system should be grounded at each end. Transferred potential during electrical faults can be avoided by not burying portions of the irrigation system or pipe near structures or structure grounding systems.

Large fires near transmission lines represent a potential electrical hazard. Hot gases and smoke can create a conductive path to ground. Flashovers can cause electrical shocks to people near the line and also cause outages. Storage of flammables and construction of flammable structures on Western's ROW are prohibited. Refueling should not be done near

transmission lines unless necessary. If refueling is necessary proper grounding is recommended. Transmission lines can interfere with circuits used to detonate explosives, and explosives can also damage power lines. Check with Western or your local utility before initiating blasting.

Tall objects, including transmission line structures, are the most likely points to be struck by lightning during a thunderstorm. Western's new transmission lines are designed with overhead ground wires and grounded structures to protect the system from lightning. If lightning strikes the overhead ground wire the strike is conducted to ground.

#### **3.4.2.2 "Field Effects"**

The electrical field effects of transmission lines can be characterized as either "electric field" or "magnetic field" effects. The electric power that we use in our homes, offices and factories uses AC or alternating current. This is in contrast to DC, or direct current, that is produced by batteries. An alternating current does not flow steadily in one direction. It alternates back and forth 60 times each second. This is called 60 hertz (Hz) power. Everything that carries or uses 60 Hz electric power produces 60 Hz electric and magnetic fields. This includes high voltage power transmission lines, intermediate and lower voltage distribution lines, wiring in homes and offices, and electrical appliances such as electric blankets, electric clocks, electric typewriters, computers, video equipment, sewing machines and hair dryers. The calculated electric and magnetic fields for the existing Gering-Stegall transmission lines are provided in Table 4-2.

**3.4.2.2.1 Electric Fields.** Electric fields can produce the following phenomena;

- corona, including audible noise (AN), visible light, radio and television interference (RI and TVI) and photochemical oxidants,
- induced currents,
- steady state induced currents,
- spark-discharge shocks, and
- physical "perception" of the field.

Corona can occur on the conductor, insulators, and hardware of an energized high voltage transmission line. Corona is the electrical breakdown of air into charged particles caused by the electrical field at the surface of the conductors. Calculated corona effects for the existing Gering-Stegall 115-kV transmission lines is presented in Table 4-1. In general, the corona effects are not likely to result in noise above existing background levels, or result in TV or radio interference. Interference is usually associated with transmission lines with voltages of 345-kV or above. Calculated amounts of photochemical oxidants (ozone) are well below the 120 parts per billion (ppb) air quality standard.

Induced currents occur when a conducting object, such as a vehicle or a person enters an electric field. Currents or voltages are induced in the object. The magnitude depends on the electric field strength and the size and shape of the object, and on whether the object is grounded. These induced currents can sometimes cause nuisance shocks.

Nuisance shocks (resulting from induced currents) from fences and buildings are eliminated by routine grounding practices. Since the electric field may extend beyond the ROW, grounding requirements may extend beyond the ROW for large objects such as long fences. Electric fences require a special grounding technique because they can only be operated if they are insulated. Metal watering or feeding troughs often require grounding.

Steady-state induced currents result when a person contacts an object and provides a path to ground for the induced current. Primary shocks, i.e. shocks that can cause physiological harm, are not possible under the existing Gering-Stegall transmission lines because of the low electric field strengths and the grounding practices that have been used.

Spark-discharge shocks occur when contact is made with an object that has induced voltage. Such shocks are similar to "carpet" shocks. These shocks could occur on the existing transmission line but would be very rare, of low magnitude and would occur only in a small area under the line near midspan.

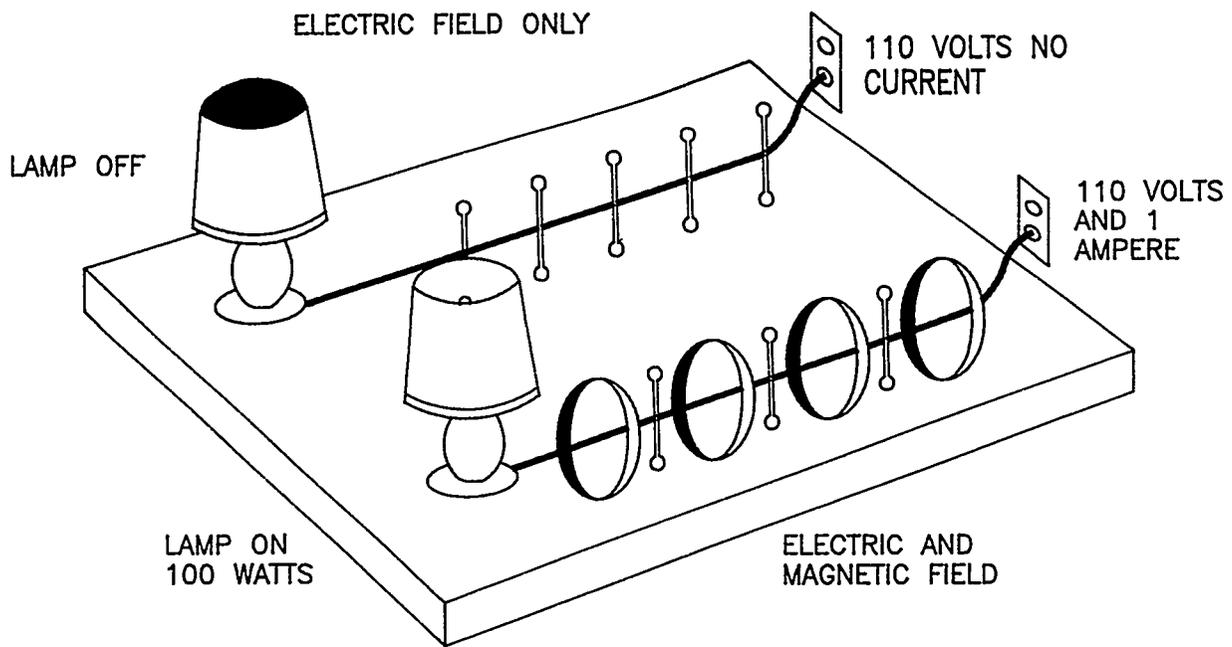
Sometimes, if an electric field is strong enough, it can be physically perceived by hair erection on an arm or hand. The sensation is like that of a slight breeze blowing over the hand. Perception of the field from a transmission line is very unlikely from the ground.

Currents and voltages that are introduced internally to the body represent a possible source of interference to cardiac pacemakers. Recognition of and concern for possible effects on pacemakers from transmission line electric and magnetic fields has led to considerable research on this topic in the last decade. The conclusions of this research is that overall risk to pacemaker wearers is minimal. The threshold electric field for interference for the most sensitive pacemakers is estimated to be 3.4 kilovolts per meter (kV/m). Reversion of pacemakers is the most substantial effect noted and is not considered a serious problem.

**3.4.2.2.2 Magnetic Fields.** When public concerns about fields from power lines were first raised over 20 years ago, the focus was on electric fields. Subsequent research now suggests that magnetic fields are probably more important. Electric fields are easily shielded or "blocked out" by conducting objects. A typical house shields about 90% of electric fields from outside. Magnetic fields can not be shielded. Magnetic field lines can travel through most materials including iron, steel, lead and the earth. In fact, the earth exhibits a magnetic field resulting from charges moving deep within the molten core of the planet.

Magnetic fields are the forces that moving charges exert on other moving charges. Magnetic fields are often expressed as field lines which extend in a continuous loop around the current. There is no magnetic field if charges are not moving, i.e. if there is no current (Figure 3-2). Magnetic fields have varying strengths and direction depending on the amount of current flowing. Magnetic field strength is measured in "Gauss" units or milligauss (mG) a thousandth of a Gauss. The magnetic field strength exerted by the earth in northern Colorado is approximately 550 mG (DC).

Magnetic field measurements for common household appliances are listed in Table 3-1. Magnetic fields and electric fields are strongest at the source and drop off quickly as you move away from the source of the current. In many cases people are exposed to higher magnetic fields from household appliances than from transmission lines because of how near they are to the source. For example, in Table 3-1, compare an electric shaver (50-300 mG), with Table 4-2, the calculated field for the Gering-Stegall North transmission line, with maximum current and the system intact (14.2 mG). The average magnetic field is likely to be less than the maximum values presented in the table. Actual on-ground field measurements taken for the Gering-Stegall transmission lines on February 4, 1994 ranged from 6.3 mG to 7.8 mG when measured directly under the center phases.



GENERATION OF MAGNETIC FIELDS BY MOVING ELECTRIC CHARGES

**TABLE 3-1****MAGNETIC FIELDS FROM HOUSEHOLD APPLIANCES SUMMARY  
OF DOMESTIC APPLIANCE MAGNETIC FIELD MEASUREMENTS**  
(magnetic field measured in milligauss (mG) 1mG = 0.001 G)

Appliance Type	Typical Range	Maximum Value
Electric Range	1 - 80	175 - 625
Refrigerator	1 - 8	12 - 187
Microwave Oven	3 - 40	65 - 812
Can Opener	30 - 225	288 - 2750
Oven	1 - 8	14 - 67
Toaster	2 - 6	9
Coffee Maker	1 - 2	4 - 25
Freezer	1 - 3	4 - 6
Mixer	2-11	16 - 387
Clothes Dryer	1 - 24	45 - 93
Dishwasher	1 - 15	28 - 712
Garbage Disposal	1 - 5	8 - 33
Ceiling Fan	1 - 11	25
Electric Blanket	3 - 50	65
Waterbed Heater	1 - 9	20 - 27
Blow Dryer	1 - 75	112 - 2125
Computer	1 - 25	49 - 1875
Typewriter	1 - 23	38
Make-up Mirror	1 - 29	44 - 125
Shaver	50 - 300	500 - 6875
Aquarium	1 - 40	50 - 2000
Sewing Machine	1 - 23	26 - 1125
Electric Drill	56 - 194	300 - 1500
Circular Saw	19-48	84 - 562

Silva, M., et al. 1988. Power frequency magnetic fields in the home. IEEE Trans. on Power Delivery. Vol 4:1:465-477, Paper No. 88WM101-8.

Magnetic and electric fields vary with the geometry of the structures, their height, conductor phasing and spacing and the current flowing at any given time. In some cases parallel transmission lines may "amplify" the field, and in other cases they may cancel out the fields.

**3.4.2.2.3 Biological Effects.** The question of whether long-term, direct exposure to electric and magnetic fields (EMF) from transmission lines causes biological or health effects in humans is a controversial topic. A decade ago, a substantial number of scientists may have doubted whether electric and magnetic fields could interact with biological mechanisms. Today the existence of "biological" effects is accepted by a majority of scientists. However, it is yet to be discovered whether these biologic effects represent a health risk.

Laboratory research spans the entire spectrum from humans, primates, rodents, tissues, cells and DNA. In human research changes in brain waves, a slowing of motor responses and a slowing in heart rate has been reported. These results were consistent but only for a "window" of exposure, that is only at 9kV/m and 200mG and not at fields above or below these values. Electric fields have been found to reduce melatonin production in rats. Melatonin regulates the thyroid gland, adrenal gland, and reproductive organs. Cellular work has shown varied responses to exposure primarily related to disturbance of biologically important ions through cell membranes. DNA transcription to RNA may be affected by exposure to EMF.

However, such effects do not necessarily imply that there are health effects. Biological effects experiments are conducted in carefully controlled laboratory conditions that may have little relevance to realistic exposure environments. In many cases the body has natural mechanisms to correct biological perturbations.

In order to assess human health risk several steps are involved. First, biological effects must be demonstrated consistently. Second, how these biological effects affect health must be determined. And finally, the frequency with which these effects occur must be evaluated.

**3.4.2.2.4 Human Health Effects.** Current research centers around demonstrating effects in the laboratory and in evaluating epidemiological data statistically to link occurrence of disease with occupational or residential exposure. Appendix A of this document includes a literature review of scientific research dealing with EMF and human health effects since about 1975.

There have been about 50 epidemiological studies on potential health hazards of electric and magnetic fields. About half of these studies are residential studies and the other half are occupational studies. At least twenty studies are ongoing.

Epidemiological studies look for statistical correlations between the occurrence of disease and other factors. Studies involving cancers, primarily leukemia (especially childhood leukemia) and brain tumors, have been the focus of investigations. When a significant statistical correlation is identified, the health risk is described in terms of a "risk factor". For example, a risk factor of 2 indicates that a disease occurs twice as often in a study population (or group of people) exposed to a certain factor as compared to a control population which is not exposed to the factor being considered. Table 3-2 provides examples of confirmed and potential cancer risk factors reported for a variety of factors including confirmed risks like smoking and potential risks like electric and magnetic fields.

In general, potential risk factors associated with some residential studies for exposure to electric and magnetic fields are in the vicinity of 2, while some occupational studies yield higher risk factors (e.g., 8). However, many studies report no statistically significant correlation. Also, the diseases involved are very rare and the total number of cases are orders of magnitude smaller than those involved in accepted correlations such as lung cancer and smoking. A recent Danish residential study reported that while electricity consumption in Denmark had increased by 30 times since 1945, cancer incidence rates had hardly changed (Guenel et al. 1993).

In conclusion, although a substantial amount of research on this subject has been done and is continuing, the body of research on health effects is still preliminary and inconclusive. Study results have not indicated a cause for immediate alarm. It is a widely held view that while the emerging evidence no longer allows the categorical assertion that there are no risks, there is no basis for asserting that there is a significant risk.

In light of this possibility of a potential risk to human health, Western, as a responsible and concerned utility, will factor EMF avoidance strategies into its transmission design and construction activities if those strategies can be accomplished at reasonable cost and are compatible with other environmental concerns.

**TABLE 3-2**

**EXAMPLES OF CONFIRMED AND POTENTIAL  
CANCER RISKS REPORTED FOR VARIOUS FACTORS**

Factor (Cancer Type)	Relative Risk	Reference
Smoking (Lung Cancer)*	10 - 40	Wyner and Hoffman, 1982
Workers Exposed to Benzene (Leukemia)	1.5 - 20	Sandler and Collman, 1987
Workers Exposed to Carbon Tetrachloride (Leukemia)	12 - 18	Sandler and Collman, 1987
Environmental Tobacco Smoke (Lung Cancer)*	2 - 3	Amman et al., 1987
High-current Power Lines (Childhood Cancer)	1.3 - 2.6	Ahlbom, 1988
Radium Contamination of Drinking Water (Leukemia)	2	Lyman et al., 1985
Use of Hair Dye	1.8	Cantor et al., 1988
Workers Exposed to Electric and Magnetic Fields (Acute Myelogenous Leukemia)	1.2 - 1.8	Savitz and Calle, 1987
Children Eating 12 or more Hotdogs per Month (Leukemia)	5.8	Peters et al., 1994

\* Generally considered as confirmed cause-and-effect associations.

### Other Points of View

Although the consensus opinion of the majority of researchers (including DOE), regarding the existence of a link between magnetic and electric field exposure and health effects, continues to center on the need for further research, there are well known and credible epidemiologists who have taken the position that adequate evidence does indeed exist by which to conclude the presence of a cause and effect relationship.

Perhaps the most prominent among these researchers is Dr. Nancy Wertheimer, whose early work with Dr. Ed Leeper in 1979 is often referenced as the beginning of the current credible research into possible EMF health effects. Since that time, Wertheimer and Leeper have published several other studies examining possible relationships between electrical wiring and adult cancers and possible effects of electric blankets on fetal development. In all these studies, Wertheimer and Leeper have observed a consistent correlation between high EMF exposure situations, often represented by surrogates such as wiring codes or electric blanket use, and negative health effects such as cancer or fetal loss. Wertheimer and Leeper's work has also attempted to control confounding variables such as age, neighborhood, or socioeconomic levels in the case of the adult cancer studies and thermal effects in the case of electric blanket users. In both cases, the authors feel that their results are able to isolate electric and magnetic fields as the likely causal mechanism for the observed health effects.

In addition to the work of G. M. Matanowski (1989), Dr. Sam Milham Jr. has published several studies between 1982 and 1988 regarding occupational exposures. Dr. Milham examined mortality from leukemia and non-Hodgkin's lymphomas in workers involved in "electrical" occupations (including electricians, power station operators, and aluminum workers) and amateur radio operators who are exposed to electric and magnetic fields as a result of their hobby. Dr. Milham has consistently concluded that elevated risks, as represented by significant excess deaths, correlate positively with elevated occupational exposures.

There have also been many news reports and articles written about EMF which tend to heighten public concerns. Among them are two books by Paul Brodeur: 1.) "Currents of Death: Power Lines, Computer Terminals, and the Attempt to Cover Up Their Threat to Your Health" published by Simon and Schuster in 1989; and 2.) "The Great Power Line Cover-up:

How the Utilities and the Government are Trying to Hide the Cancer Hazard Posed by Electromagnetic Fields", published by Little, Brown and Company in 1993. A review of Mr. Brodeur's 1989 book authored by M. Granger Morgan and published in the April 1990 issue of "Scientific American" objectively evaluates Mr. Brodeur's assertions. Professor M. Granger Morgan is Head of the Department of Engineering and Public Policy and a Professor of Electrical and Computer Engineering at Carnegie Mellon University.

### EMF Regulations

Across the country, states and public utilities have taken various approaches to "regulating" electromagnetic fields. Two popular strategies are "prudent avoidance" and establishing "threshold" standards. There are no thresholds or standards established by the federal government.

Prudent avoidance is essentially a policy that provides for limiting public exposure to EMF using low and no-cost field management techniques. This includes considering alternative design and siting approaches for new and upgraded transmission facilities, particularly when facility siting may occur in populated areas. For example, avoiding siting new facilities near schools or hospitals is considered prudent avoidance. Also using special design techniques, such as the inverse phasing proposed for the Gering-Stegall double circuit, is also a prudent avoidance measure. Western's approach in limiting or reducing EMF exposure is to follow a policy of "prudent avoidance".

Regulators in at least 11 states have adopted practices for mitigating exposure to EMF's. For example, two states, Florida and New York, have established thresholds for EMF levels taken at the edge of rights-of-way. In Florida, EMF limits at the edge of rights-of-way are 150mG for transmission lines of 230-kV or less and 200mG for larger transmission lines. New York has adopted an interim standard of 200mG at the edge of rights-of-way. These threshold levels are not based on scientific evidence relative to potential health effects, but rather reflect the largest EMF levels currently present in the environment under existing transmission lines. In other words, EMF levels for new facilities can not exceed the highest levels known for existing facilities of similar size in that state. This maintains the status quo while further research into possible EMF health effects is ongoing. Western's proposed Gering-Stegall double circuit would be well below these legislated standards.

At least 9 states (California, Colorado, Connecticut, Illinois, New Jersey, Ohio, Rhode Island, Texas and Wisconsin) have endorsed policies requiring utilities to apply prudent avoidance or related concepts when seeking approval to site new transmission lines or modify the location of existing ones. These states require utilities that plan to construct new transmission projects to provide information to state utility regulators about the potential impact on public health of a planned project, including any increased risk due to an increased exposure to EMFs.

Should science establish a significant risk to public health as a result of EMF exposure, it is likely that the issue of EMF standards, avoidance strategies, and evaluation procedures, would be addressed in statute and implemented by regulation after a careful structured public debate that weighs risk against cost. Western as well as all other utilities would be subject to any future regulations.

#### The National Electric and Magnetic Research and Communication Program

Since electric and magnetic fields are created during the generation, delivery and use of electric power, everyone in the United States is exposed to various types and levels of EMFs. Over the past 20 years, there has been increasing public concern that exposure to electric and magnetic fields may result in adverse human health effects. In 1992, concern about this issue reached the point where a focused and coordinated national program was needed to address the public's questions on EMFs as expeditiously as possible within available resources. On October 24, 1992, Congress enacted the Energy Policy Act of 1992 which contained provisions for a five year National EMF Research and Communication Program. The program's goals are to determine if there are adverse effects on human health from EMF exposure; assess human exposures to electric and magnetic fields, develop options to reduce EMF exposures from various utility, residential, commercial, industrial, and transportation sources; and respond to the needs of the public, decision makers, and other interested parties by communicating understandable, credible, and balanced information of the results of EMF research.

The National EMF Research and Communication Program is intended to be national in scope, presenting a framework that will allow Federal agencies, states, businesses, research organizations, unions, universities, and concerned citizens to sponsor, conduct, coordinate, or

otherwise participate in EMF research and communication. The program goals, objectives, and activities are the result of collaboration with the EMF research community, citizens, government and private sector policy makers, and other interested parties.

The program plan recommends activities that should be considered for the next five years in four related program areas: Scientific Research, Engineering Research, Communications and Policy Support. The plan recommends the timing or sequencing of these activities and presents preliminary costs (unconstrained by availability of resources) to implement activities for the five-year period. The greatest funding emphasis is placed on the EMF Scientific Research component to determine if EMF exposures result in health effects and emphasizes research on those potential health outcomes of greatest concern.

The Scientific Research program component seeks to determine the biological effects of EMFs on humans, animals, tissues, and cells; the mechanisms of interaction underlying these effects; biological indicators of exposure; and the association between EMF exposure and human health risks through well-defined epidemiologic studies. The Engineering Research program component will assess EMF exposures and develop and evaluate technologies for mitigating fields and options for managing EMF exposures. The Communications program component will gather, develop, and disseminate scientific and technical information on EMF issues in an easily understandable format. The EMF Policy Support program component will assist policy makers in developing effective public policies based on sound research findings and legal, economic, sociologic, and other studies.

The plan addresses research and communication activities from a national perspective; therefore, the Federal government is not intended to be the only sponsor of the activities presented. The following contributors will be instrumental in implementing and coordinating national EMF research and communication:

**The EMF Research and Public Information Dissemination Program established by the Energy Policy Act of 1992.** This is a Federal program that authorizes \$65 million over five years to be appropriated to DOE for EMF research and information dissemination. Non-federal sources will contribute at least 50% of the total funding for all activities under the program. The health research activities and related communication efforts will be directed by

the National Institute of Environmental Health Sciences (NIEHS) in cooperation with DOE, while DOE will direct the engineering research program and related communication. A Federal EMF Interagency Committee will facilitate the coordination of Federal activities and develop the research agenda.

- **Other Federal Agencies.** In addition to DOE and NIEHS, following are other Federal agencies engaged in EMF research and communication: the Environmental Protection Agency, the Food and Drug Administration, the National Cancer Institute, the National Institute for Occupational Safety and Health, the National Institute of Standards and Technology, the Occupational Safety and Health Administration, the Department of Transportation, and the Department of Defense. Exclusive of the Department of Energy (\$5 million) and the Department of Defense (\$4 million), other Federal agencies have funded approximately \$6 million for EMF activities in fiscal year 1992.
- **States and Private Sector Organizations.** New York, Florida, and California are among the states that presently support EMF activities. In the private sector, the Electric Power Research Institute is the major EMF research sponsor, with a 1993 budget of approximately \$15 million for EMF health effects studies, field characterization and management research, and information services.

The EMF-related activities of various Federal agencies will be coordinated through the Interagency Committee. The Interagency Committee will also maintain a liaison with state and private sector organizations to ensure the coordination of research activities nationwide. The Energy Policy Act of 1992 requires the Director, NIEHS, to report the research findings from the National EMF Research and Communication Program to the Congress by March 31, 1997.

Future actions will be driven largely by the results of scientific research. If scientists widely conclude that EMFs pose adverse health effects, then the required actions could be very expensive. The costs of mitigation EMF emissions from existing and new lines will vary with various geographic, engineering, and environmental factors. Nevertheless, the cost

estimates that are beginning to emerge range from tens of billions to hundreds of billions of dollars nationwide to reduce the public's exposure to EMFs from all transmission and distribution lines.

### **3.4.3 Socioeconomics**

#### **3.4.3.1 Population and Demographics**

The study area encompasses a portion of the City of Gering as well as surrounding Scotts Bluff County and a portion of Scotts Bluff National Monument. In 1990, the most recent year for which data is available, the population of Gering was 7,946 and the population of Scotts Bluff County was 36,025 (U.S. Dept. of Commerce 1993). During the period from 1980 to 1990, the population of Scotts Bluff County decreased from 38,344 to 36,025, while the population of Gering increased slightly from 7,760 to 7,946 (U.S. Dept. of Energy 1991).

In Gering, there are more females (4,178) than males (3,768). Persons between the ages of 18 and 44 years make up over a third of the population of Gering (37 percent), persons under 18 years of age account for 29 percent of the total population, and persons over 65 years of age account for 17 percent. The median age in Gering is 35.2 years (U.S. Dept. of Commerce 1993).

#### **3.4.3.2 Housing**

There are 3,167 total housing units in Gering, of which 2,106 are owner occupied, 928 are renter occupied, and 133 are vacant. The majority of housing in Gering consists of single-family houses. The median value of owner occupied homes is \$43,100 and the median monthly rental rate is \$264 (U.S. Dept. of Commerce 1993). The homeowner vacancy rate in 1990 was reported as 1.7 percent and the rental vacancy rate was 5.4 percent.

#### **3.4.3.3 Community Resources**

Community resources include law enforcement, fire protection, medical facilities, parks, schools, and utilities.

In Scotts Bluff County, law enforcement is handled by the county sheriff's department and fire protection is handled by a rural fire protection district with volunteer fire fighters. In Gering, a 13-man police force and 46-man volunteer fire department augment the county law enforcement and fire protection services (U.S. Dept. of Energy 1991). A regional hospital is located in Scottsbluff, a short distance from Gering. The portion of Gering that is within the study area includes the local high school, grade school, and Northfield Park.

#### **3.4.3.4 Economy**

The economy in the study area is strongly based in agriculture and its associated industries. Crops produced in the region include corn, dry edible beans, sugar beets, alfalfa hay, nursery crops, barley, oats, wheat, and family gardens. Tourism is gaining in economic importance in the area due to the Scotts Bluff National Monument. Between 1987 and 1991 the average annual visitation to the monument was 166,391 persons. Visitation peaks during the months of July and August (NPS 1993). Retail trade, manufacturing, health services, and government also contribute to the local economy in terms of employment.

#### **3.4.4 Cultural Resources**

The project area contains evidence of prehistoric and historic use. Thirteen prehistoric sites have been recorded on the Scotts Bluff National Monument within the project area. These sites include bone, charcoal, and chipped stone implements, indicating hunting, tool manufacturing, food preparation, and camping activities. Time of occupation of most of these sites is not known, but archaeological and historical evidence indicates that humans have occupied the larger region for at least 10,000 years (Mattes 1992). Historic American Indian groups that were present in the region included the Lakota, Arapaho, Cheyenne, Kiowa, Pawnee, and Plains Apache.

Historically, segments of the Central Overland Trail, also known as the Emigrant Trail and Mormon Trail, ran within one-half mile to three miles of the project area. Scotts Bluff (listed on the National Register of Historic Places) was a prominent feature on the Trail. There are no known trail segments within the project area (Gerstle 1994).

The town of Gering was platted in 1888. There is one historic structure in Gering listed on the National Register within the project area. The Severin Sorensen House at 2345 17th Street, was built about 1910 and completed in 1916. It is a brick house built in the Renaissance Revival style by Sorensen. Sorensen's brickyard (Gering Brick Company) was located adjacent to his house and supplied bricks for many structures in the North Platte Valley during early 20th century development.

An archaeological survey of the Proposed Action resulted in the recording of five historic sites. One site is a complex of concrete foundations and platforms, associated with trash and building materials. It was probably used as corrals and stables from 50 or 60 years ago to 35 or 40 years ago (Gerstle 1994).

Three of the sites are irrigation canal segments including the Gering Lateral of the Goshen Ditch, the Gering Canal, and an unnamed feeder irrigation ditch. Appropriation dates indicate the canals were constructed starting in the first decade of the twentieth century. One feature (a siphon) of the Gering Lateral was constructed in 1924. All three sites are still in use (Gerstle 1994).

One additional possible historic site location was reported at the present-day Gering High School. A log cabin had reportedly stood at this location until it was torn down prior to the school's construction in the mid-1970's. There is no visible evidence of the structure at this location (Gerstle 1994).

The fifth recorded historic site is the remnants of the Archer-Stegall transmission line, constructed in 1939. It was de-energized in 1986 and the line was dismantled except for the 1.3 mile segment through the project area.

### **3.4.5 Visual Resources**

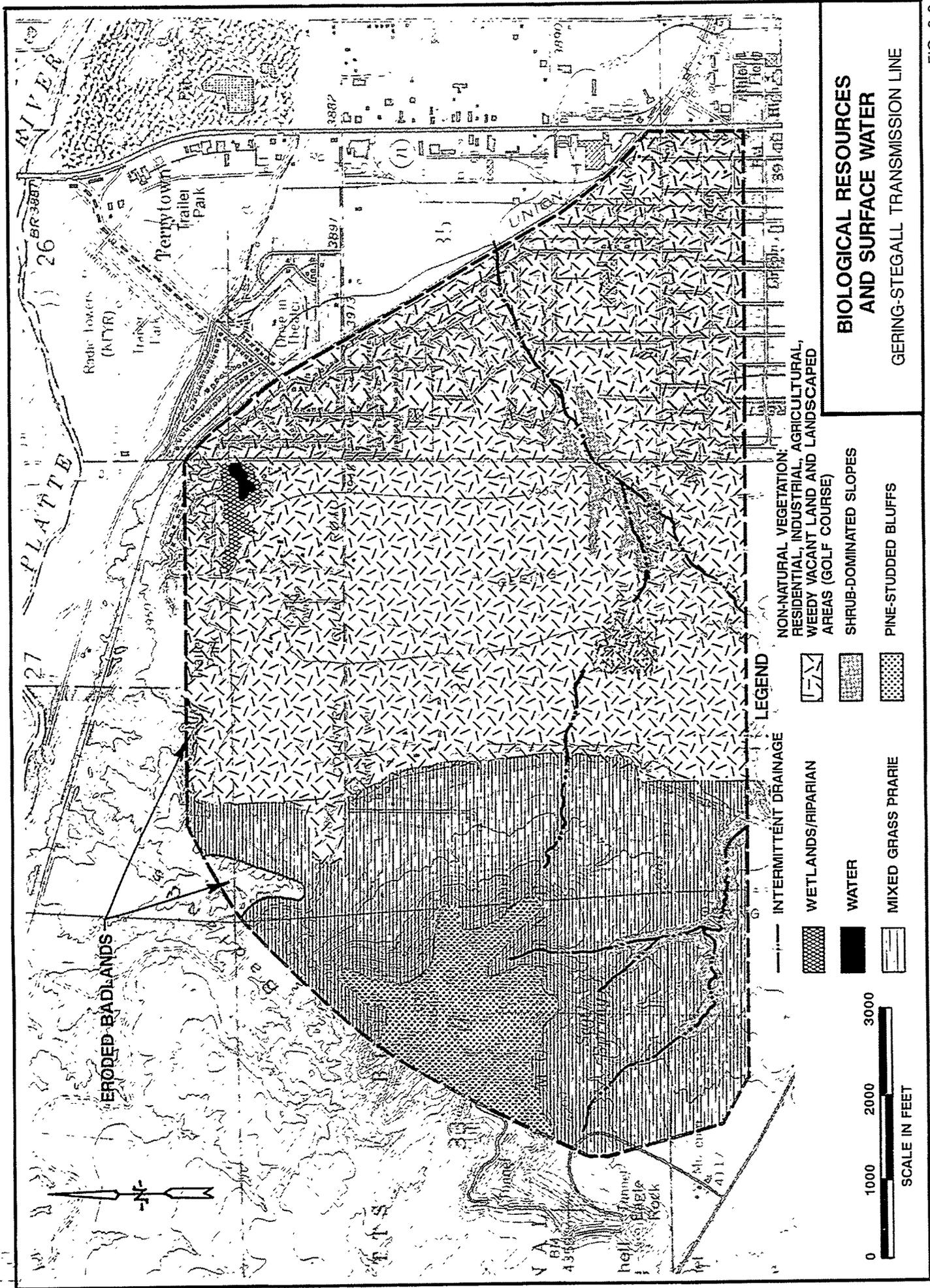
Assessment of the visual resources within the study area is based on procedures developed by the Soil Conservation Service as described in Technical Release No. 65, Procedures to Establish Priorities in Landscape Architecture (SCS 1978). Evaluation of the visual resource includes an analysis of three major factors: visual quality, existing land uses, and visibility.

Visual resource quality is based on the four landscape elements of landform, vegetation, water features, and structures, and combinations of these four elements. Landscapes are rated as being of distinctive, average, or minimal quality, and are judged within a local frame of reference. Land use is a description of both the direct and indirect uses of the land and is rated as being most important, important, and of minimal importance. The most important category includes land uses that are considered one of a kind, the important category are land uses that are considered ordinary within the local area, and, the minimal importance category are those land uses that are very common to the area. Visibility is an estimate of the number and type of viewers, and their frequency and duration of view.

The study area contains landscapes of varying quality, visibility, and land uses. Starting on the eastern side of the study area (east of State Highway 71), land uses are typical of an urban environment, including industrial areas, residential development, schools, churches, and parks. U street, which the proposed transmission line would parallel, contains three large H frame transmission lines on the north side of the street and smaller distribution lines on the south side. The visual quality along U street is average to minimal; the visibility is average to high. The Northfield Park and Open Space is of distinctive visual quality because of its green open areas, small stream and recreational facilities. The rest of the eastern portion of the study is of average visual quality.

Continuing west across State Highway 71, the proposed transmission line (and existing transmission line ROW) crosses vacant land, an irrigation ditch, the Gering Landfill, and cropland before reaching the eastern boundary of the Scotts Bluff National Monument. Visual quality and visibility of this section of corridor is average, except for the landfill which is of minimal visual quality. On the north end of the study area the Gering Golf Course is of average to distinctive visual quality and is a recreational land use sensitive to visual disturbance in the landscape. A pond and wetland/riparian area located on the west side of Highway 71 in the northern part of the study area (see Figure 3-3) has water and vegetation features which are unique within the study area.

Scotts Bluff National Monument is located in the western portion of the study area and provides a natural scenic landscape dominated by the 800 foot high bluffs rising from the plains. The landscape within the monument is a unique resource. The diversity of landforms



and vegetation, and the important historic value of the monument creates both a physical and cultural landscape of distinctive quality. The unique landforms are of scenic value within the monument, and also from outside the monument boundary, as the bluffs provide a scenic backdrop from many viewpoints within the town of Gering and from travel routes. Views from the parking lot and the south overlook on top of Scotts Bluff includes sections of the existing transmission lines running east into Gering and south across State Highway 92.

### **3.5 BIOLOGICAL RESOURCES**

#### **3.5.1 Threatened and Endangered Species**

Several threatened, endangered, candidate or sensitive species are known to occur or potentially occur in the study area, based on information provided by the U.S. Fish and Wildlife Service (USFWS) and Nebraska Game and Parks Commission (Appendix C). Western has prepared a biological assessment pursuant to Section 7.0 of the Endangered Species Act, which is presented in Appendix D. This section includes a summary of the information provided in the biological assessment, for listed and candidate endangered and threatened species, and additional information on rare and sensitive species.

The listed threatened or endangered species potentially or historically present in the study area are bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), and black-footed ferret (*Mustela nigripes*).

Bald eagles occur in western Nebraska mainly as winter residents, primarily occurring in riparian forest and along rivers and lakes. Bald eagles are considered to be rare migrants at Scotts Bluff National Monument, in riverine woodland and canal riparian habitat (Cox and Franklin 1989a,b). They are likely to be even more rare within the study area, because only one small area has riparian vegetation, and any occurrences are expected to be transitory (i.e., birds flying over the area). No active winter roosts are known to occur near the study area (Diamond 1994).

Peregrine falcons are rare migrants in western Nebraska, occurring mainly in April-May, September and October. There are two records of sightings at Scotts Bluff National

Monument (Jobman 1994). While they may occasionally occur in the study area, their presence is likely to be rare and of short duration.

The study area is within the historic range of black-footed ferret, but this species is thought to be extirpated from Nebraska. Black-footed ferrets are closely associated with prairie dog towns, where they find shelter and prey. The nearest known black-tailed prairie dog town is located in the northwestern portion of Scotts Bluff National Monument, a mile or more outside of the study area boundary. This colony occupied 40 acres in 1993, which is too small to support a black-footed ferret (National Park Service 1993).

Several category 2 candidate species may also occur. Category 2 candidate species are those for which the USFWS needs to obtain more information about rarity or endangerment before they can be proposed for listing. Loggerhead shrike (*Lanius ludovicianus*) is reported to be a summer resident—common on shrub-dominated slopes and uncommon in mixed grass prairie—at Scotts Bluff National Monument (Cox and Franklin 1989b). They may occur anywhere within the study area. Ferruginous hawk (*Buteo regalis*) have not been reported from Scotts Bluff National Monument, but may occur in the study area as a migrant. Fringe-tailed myotis (a bat, *Myotis thysanodes pahasapensis*) has also not been recorded at the monument but may occur during seasonal migration (Cox and Franklin 1989b). Swift fox (*Vulpes velox*) is thought to be extirpated from the monument, and is therefore unlikely to occur in the study area.

Two Nebraska species of special concern are known to occur at Scotts Bluff National Monument: great blue heron (*Ardea herodias*) and golden eagle (*Aquila chrysaetos*). Although they are likely to occur in the study area, no critical habitat features, i.e., golden eagle nests or heron rookeries, are known to occur. Normal feeding habitat for great blue heron is likely to be limited to the pond and wetland/riparian area in the northern portion of the study area.

Several plant and animal species considered rare by the Nebraska Natural Heritage database are reported to occur within Scotts Bluff National Monument (Table 3-3, Nebraska Game and Parks Commission 1993). Most have been reported from within the study area, in native grasslands or on cliffs and bluffs. The other species occur in similar habitats and may be present in the study area, in native grasslands or on cliffs and bluffs. None of them have any

TABLE 3-3

NEBRASKA NATURAL HERITAGE SPECIES KNOWN  
TO OCCUR OR POTENTIALLY BE PRESENT IN STUDY AREA

Common Name	Scientific Name	Ranking		In Study Area
		Global	State	
White-throated swift	<i>Aeronautes saxatalis</i>	G5	S4	Yes
Busy-tailed wood rat	<i>Neotoma cinerea</i>	G5	S3	Yes
Four-wing saltbush	<i>Atriplex canescens</i>	G5	S2	
Tassel flower	<i>Brickellia grandiflora</i>	G5	S2	
Howard rabbit brush	<i>Chrysothamnus parryi</i> <i>ssp howardii</i>	G5T5	S3	Yes
Mountain cats-eye	<i>Cryptantha cana</i>	G3	S3	
Hoary fleabane	<i>Erigeron canus</i>	G4	S2	Yes
Wild-buckwheat	<i>Eriogonum pauciflorum</i> <i>var. gnaphalode</i>	G5TU	S3	Yes
Purple mission-bells	<i>Fritillaria atropurpurea</i>	G5	S2	Yes
Ball-head standing cypress	<i>Ipomopsis congesta</i>	G5	S2	Yes
Nuttall desert-parsley	<i>Lomatium nuttallii</i>	G3	S1	
Phacelia	<i>Phacelia hastata var</i> <i>leucophyla</i>	G5T5	S2	
Desert skeletonplant	<i>Stephanomeria runcinata</i>	G5	S?	Yes
White camas	<i>Zigadenus elegans</i>	G5	S1	Yes

Nebraska Natural Heritage Program Rankings (Nebraska Natural Heritage Program 1992)

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range or because of other factors making it vulnerable to extinction throughout its range; (21 to 100 occurrences).

G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

**TABLE 3-3  
(Concluded)**

- G5 = Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
- T5 = Same as G5, but for a subspecies or variety.
- TU = Subspecies or variety possibly in peril range-wide but status uncertain; need more information.
- S1 = Critically imperilled in state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation from the state.
- S2 = Imperilled in state because of rarity (6 to 20 occurrences few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.
- S3 = Rare or uncommon in state (to 100 occurrences).
- S4 = Apparently secure in state, with many occurrences.
- S? = State rarity unknown.

federal or state protection or status. All of the species reported as present in the study area in Table 3-3 have been found in Section 33 (the extreme western portion of the study area), except for hoary fleabane in Section 34 (near the western portion of the proposed action).

### **3.5.2 Wetlands/Important Habitats**

Figure 3-3 shows that about two-thirds of the study area consists of non-natural vegetation, such as agricultural fields, urban/developed areas, weedy areas, and landscaped areas. There are, however, areas of biological importance including a pond and adjoining wetlands/riparian area in the northeast part of the study area and native prairie, shrub, and pine communities within Scotts Bluff National Monument.

The pond is approximately 1 acre in size, with 2-3 acres of wetland and riparian vegetation around the edges, particularly on the western side. Wetland species observed during a July 1994 field visit to the site include cattail, sedges, and rushes. Although surrounded by residential areas, this area likely provides forage, water, and cover for a variety of wildlife species, such as songbirds and small mammals. The National Wetlands Inventory (NWI) map (USFWS 1992) has the pond portion of this area mapped as PABFH (palustrine, aquatic bed, semi-permanently flooded, diked/impounded). This is consistent with field observations. The wetland and riparian area adjacent to the pond is not marked on the wetlands map but appears to be mostly palustrine emergent, seasonally flooded/saturated, wetland, following to NWI mapping conventions.

The NWI map also shows a palustrine emergent temporarily flooded area of a few acres, south of U Street and west of the Gering Canal. This is an area which temporarily ponds behind the Gering Canal following heavy rains (Baird 1993). During the field reconnaissance on June 28, 1993, it was dry and did not appear to have any wetland characteristics.

Other important habitats in the study area include the native mixed-grass prairie, shrub dominated slopes, and pine-studded bluffs found at Scotts Bluff National Monument. These areas are considered important habitat because of their natural condition and unique characteristics in an otherwise large agricultural area. The vegetation has been protected from grazing and other man-made influences since the 1930's. Scotts Bluff National Monument as a whole is home to 136 species of amphibians, reptiles, birds, and mammals.

## **3.6 EARTH RESOURCES**

### **3.6.1 Water Resources**

Surface water resources in the study area are limited. They include 1) the Gering Irrigation Canal which runs through the center of the study area, the Gering Lateral, which runs along the edge of Scotts Bluff National Monument in the southern half of the study area, and small irrigation ditches; 2) several small intermittent drainages, beginning in Scotts Bluff National Monument and merging into one drainage which runs through the City of Gering; and 3) one small pond, described above in Section 3.5.2, Wetlands/Important Habitats. The drainage through the City of Gering is blocked by the Gering Canal, several streets without culverts and fill from a trench landfill on the south side of the street. Whatever flow comes down the drainage is captured behind the Gering Canal and usually evaporates within a day or two (Baird 1993).

### **3.6.2 Floodplains**

The Federal Emergency Management Agency (FEMA) maps floodplains for the National Flood Insurance Program, particularly special flood hazard areas inundated by 100-year and 500-year floods. FEMA floodplain maps are available for the study and show that there are no flood hazard areas within the entire study area. The portion of the study area within the City of Gering is classified as Zone C, areas of minimal flooding. The portion of the study area in unincorporated Scotts Bluff County is classified as Zone X, areas determined to be outside the 500-year floodplain (FEMA 1979, 1990).

### **3.6.3 Soils**

Two soil associations are found in the study area, the Mitchell-Keith-Epping association found in the Scotts Bluff National Monument portion of the study area and the Mitchell-Otero-Bufferington association found in the remainder of the study area. Soil associations have a distinctive pattern of soils (the same soils occur repeatedly), relief, and drainage characteristics. The Mitchell-Keith-Epping association is comprised of deep and shallow, loamy and sandy soils mainly on uplands. The Mitchell-Otero-Bufferington association is comprised of deep, silty, sandy, and clayey soils on valley floors (such as the Gering Valley).

Soil associations are typically named after the dominant soil series found in an area. Soil series generally have soil layers with similar composition, thickness, and arrangement. They are generally derived from the same parent material and have similar vegetation and degree of weathering. Soil series in the study area have been mapped and characterized by the Soil Conservation Service (SCS 1968). Pertinent soil characteristics related to this project include erodibility and prime farmland. Table 3-4 lists the soil series found in the study area and their pertinent characteristics. Nearly all of the agricultural land in the study area is considered prime farmland because it is irrigated and occurs on soil series considered prime when irrigated. Water erosion potential is moderate to high on most soils in the study area, and high on gullied land and on steeper portions of Mitchell silt loam. All soils have low to moderate wind erosion potential.

TABLE 3-4

SOIL SERIES, LOCATION, AND PERTINENT CHARACTERISTICS

Symbol	Soil Map Unit	Location in Study Area	Erodibility Water/Wind	Prime or Unique Farmland
Mt	Mitchell silt loam, 0-1% slopes	This unit is found in the eastern-most part of the study area, and underlies much of the City of Gering. <b>Approximately 1/2 mile of the proposed route is within this unit, from the substation west.</b>	moderate/low- moderate	Prime when irrigated
MtA	Mitchell silt loam, 1-3% slopes	This unit makes up a large portion of the middle of the study area in both agricultural and urban settings. <b>A small section of the proposed route crosses this unit west of the landfill.</b>	moderate/low- moderate	Prime when irrigated
MtB	Mitchell silt loam, 3-5% slopes	This unit is found east of Scotts Bluff Natl. Monument and north of the proposed route. The proposed route would not cross this unit.	moderate/low- moderate	
2MtB	Mitchell silt loam, thin, 1-5% slopes	This series is found primarily in the eastern part of Scotts Bluff Natl. Monument. <b>The end of the proposed route where it ties into the existing lines is located in this unit.</b>	moderate/low- moderate	Prime when irrigated
2MtC	Mitchell silt loam, thin, 5-9% slopes	This unit is found in Scotts Bluff Natl. Monument below the bluffs. The proposed route would not cross this unit.	moderate/low- moderate	

TABLE 3-4  
(Continued)

Symbol	Soil Map Unit	Location in Study Area	Erodibility Water/Wind	Prime or Unique Farmland
2MtD	Mitchell silt loam, thin, 9-20% slopes	Only a small amount of this unit is found in the study area, within Scotts Bluff Natl. Monument. The proposed route would not cross this unit.	high/low-moderate	
GL	Gullied Land	Gullied land is found in a northeast trending band across the southern part of the study area from Scotts Bluff Natl. Monument to the railroad tracks. <b>Approximately 1/3 mile of the proposed route crosses gullied land in the vicinity of the landfill.</b>	high/low-moderate	
BB	Barren badland	Only a small amount of barren badland is found in the northern part of the study area, within Scotts Bluff Natl. Monument. The proposed route would not cross this unit.	(1)	
RE	Rock outcrop - Epping Complex	Rock outcrop is found in the bluffs area of Scotts Bluff Natl. Monument. The proposed route does not cross rock outcrop.	moderate-high/ low-moderate (2)	
RT	Rock outcrop - Tassel Complex	Rock outcrop is found in the bluffs area of Scotts Bluff Natl. Monument. The proposed route does not cross rock outcrop.	moderate-high/ low-moderate (2)	

**TABLE 3-4  
(Concluded)**

Symbol	Soil Map Unit	Location in Study Area	Erodibility Water/Wind	Prime or Unique Farmland
Sy	Broken alluvial land	Only a small amount of broken alluvial land is found in the northwest part of the study area, within Scotts Bluff Natl. Monument. The proposed route would not cross this unit.	(1)	

(1) Characteristics are too variable for interpretation

(2) Interpretations were made for the Epping and Tassel components of these complexes; no interpretations were made by SCS for rock outcrops

Source: SCS 1968

**ENVIRONMENTAL CONSEQUENCES**

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**4.1 HUMAN RESOURCES****4.1.1 Land Use****4.1.1.1 Existing Land Use**

The 7100 foot long ROW for the Proposed Action will cross areas mapped as industrial (about 200 feet), residential (600 feet), school (400 feet), parking lot (500 feet), vacant (1200 feet), landfill (1200 feet), agricultural (1200 feet), tennis court (300 feet) and Scotts Bluff National Monument (100 feet). About half of the ROW would overlap with U street. It would mostly overlap with the existing Archer-Gering ROW, but would be a few feet wider.

If the proposed action has 11 or 12 structures, the tentative structure locations (from east to west along U Street) would be: one in industrial land, three at Gering High School (edge of lawn, playing field, and parking lot), one in church parking lot, one in residential, two in vacant land, one in agricultural land, and two in landfill. In all areas, the structures would be placed adjacent to U Street and generally on street or property corners, and should have minor conflicts with other land uses. No new transmission line structures would be placed within Scotts Bluff National Monument, but existing turning structures would be utilized and would be re-conducted.

Although current residential, institutional, industrial, and recreational land uses in the study area are generally sensitive to the construction and operation of transmission lines, the proposed project would result in reduced impacts to these land uses over the long-term due to less intrusion on private properties by Western personnel and their equipment during maintenance activities. Maintenance activities would be less intrusive because the new transmission structures would be fewer in number and far more accessible. At present, there are 31 structures along the three existing transmission lines. Under the Proposed Action, the number of structures would be reduced to 11-14. Moreover, the new transmission line structures would be located immediately adjacent to U Street, instead of on private properties

which generally have poor access for equipment. If the proposed action utilized 11 or 12 structures, there would be a net removal of seven structures from residential properties, two from church property, and four from the high school. These numbers might vary slightly if 13 or 14 new structures are used. The ROW for the Proposed Action would cross nine residential properties, compared to 31 under existing conditions.

Historically, both the Gering-Stegall North and South transmission lines and their associated ROWs were located entirely within private property in the eastern third of the study area. Under the Proposed Action, Western would utilize the existing and inactive Archer-Gering ROW (45 feet wide), roughly half of which overlaps with U Street and the adjacent sidewalk. The remaining ROW (22.5 feet) is located on private property. Since the Proposed Action would require a ROW that is 52 feet wide, an additional 7 foot easement would have to be purchased by Western, thereby increasing the total ROW width across private property to about 26 feet. The ROW would only cross the front and/or side yards of residences along the route instead of entire properties as historically has been the case.

During the construction phase of the project, short-term adverse impacts to private land uses would likely occur as line removal crews would have to enter residential, industrial, and institutional properties on the north side of U Street to dismantle the current Gering-Stegall North and South transmission line structures. Similarly, assembly of the new transmission lines structures along U Street would cause some short-term disruption of adjacent land uses, due to physical intrusion, obstruction of traffic and the generation of dust and noise.

There would be minor positive impacts to agricultural land and the landfill. If the proposed action uses 11 or 12 structures, there would be a net removal of three double-pole structures presently in the middle of agricultural fields, thereby slightly increasing the amount of available agricultural land. The elimination of the H-frame structures and their guy wires would return about 0.05 acre of land back to agricultural production. The location of the new structures along the roadway would improve turning conditions for field equipment. The taller structures would create some hazard for aerial applicators but overall the removal of structures from the field should improve flying conditions. At the landowners' request, Western would eradicate any weed infestations associations with the easements in agricultural lands. There would also be a net removal of four structures from the middle portions of the landfill, which would likely improve landfill operational flexibility. Two of the current

structures are currently on pedestalled "islands" of original ground surface, surrounded by excavated areas.

Since the proposed transmission line would be located along an existing transmission line route, the proposed project would not be in conflict with any local land use policy or ordinance. Review of local land use planning and zoning information revealed no restrictions on routing of utilities or transmission lines along the proposed route (Gering Planning Commission 1980; Gering City Council 1991; Baird 1993).

With respect to project alternatives, only the structure design (parallel crossarm) alternative would result in different land use impacts than those described for the Proposed Action. Since the parallel crossarm design would require a wider ROW (80 feet compared to 52 feet), more areas of incompatible land uses would be incorporated into the ROW. Under that alternative, the private property easement required would be approximately 40 feet, which is roughly 18 feet wider than the existing Archer-Gering ROW, and 14 feet wider than the Proposed Action. The wider ROW is needed primarily to accommodate conductor sway. The amount of physical intrusion for maintenance activities would be the same.

#### **4.1.1.2 Planned Land Uses**

As mentioned in Section 3.4.1.2, some new residential development may occur in the central third of the study area to the west of the Scotts Bluff National Monument Visitor Center and to the north of U Street and the existing transmission lines. Construction of the proposed project would not affect these planned land uses because the new structures and transmission lines would be located to the south of these new developments. No physical intrusion of construction workers or operation and maintenance personnel or associated equipment would be required at the locations of known planned developments.

#### **4.1.2 Public Health and Safety and Electrical Effects**

This section discusses the environmental effects of the Proposed Action compared to the existing conditions relative to public health and safety.

#### **4.1.2.1 Shock and Safety Hazard**

The proposed new double circuit transmission line, like the existing Gering-Stegall transmission lines, would be constructed to NESC standards. The operation of the transmission line would not present a safety or electrical hazard to the general public. The new transmission line would be constructed at the edge of U Street, a city street. Overall, potential safety hazards from activities such as kite flying and tree trimming, or ROW encroachments, would be greatly reduced (a reduction of 3 to 1). The new project would have less opportunity for interaction with people and hazardous activity than the existing transmission lines. The existing Gering-Stegall transmission lines, which presently span over homes and backyards in a residential neighborhood, would be removed. And finally, the new transmission line would require less maintenance than the existing lines reducing shock hazard exposure for linemen and maintenance forces.

Western's standard grounding policies effectively mitigate the possibility of nuisance shocks due to induced currents from stationary objects such as fences and buildings. No special safety measures would be necessary for any of the project design alternatives.

#### **4.1.2.2 Field Effects**

Since this project does not involve upgrading the voltage of the lines and the current and electrical load of the circuits would remain the same, calculated field effects are very similar between existing conditions and the proposed action. Calculated corona effects such as audible noise, radio and television interference and ozone would not change significantly (Table 4-1). However, electric field and magnetic fields would be less for the Proposed Action than currently present for the existing transmission lines (Table 4-2). This is because Western is proposing to construct the new transmission lines in a double circuit configuration with "inverse phasing". Inverse phasing reverses the orientation of the phases on the second circuit so that the phases "cancel out" rather than "amplify" the electric and magnetic fields. The maximum electric field (at the edge of the ROW) would be about 0.5 kV/m for the double circuit post insulator design (the Proposed Action) compared to 1.4 kV/m for the existing single circuit H-frame configurations. The maximum magnetic field (at the edge of the ROW) would be 27.2 mG for the double circuit post insulator design compared to 43.4 (Gering-Stegall North transmission line) and 41.5 mG (Gering-Stegall South transmission

**TABLE 4-1**

**Calculated Corona Effects for the Gering-Stegall  
Double Circuit Transmission Line Project<sup>1</sup>**

	Voltage, kilovolts (kV)	ROW Width, feet	Average Conductor Height Above Ground, feet	Average Wet-weather Audible Noise at Edge of ROW, decibels A-weighted (dBA)	Average Fair-weather Audible Noise at Edge of ROW, decibels A-weighted (dBA)	Average Wet-weather Radio Interference (RI) at Edge of ROW, decibels above 1 microvolt per meter (dB $\mu$ V/m)	Average Fair-weather Radio Interference (RI) at Edge of ROW, decibels above 1 microvolt per meter (dB $\mu$ V/m)	Wet-weather Television Interference (TVI) at Edge of ROW, decibels above 1 microvolt per meter (dBuV/m)	Maximum Incremental Ozone-levels at Ground Level, parts per billion (ppb) <sup>2</sup>
Existing Gering-Stegall North 115-kV system with 397.5 conductor on H-frame wood pole, single circuit (1 ckt.) configuration	115	80	34	25.6	0.6	41.8	24.8	3.4	0.02
Existing Gering-Stegall South 115-kV system with 397.5 conductor on H-frame wood pole, single circuit (1 ckt.) configuration	115	50	34	26.3	1.3	46.1	29.1	6.0	0.02
Option A, Table 4-2	115	80	33 <sup>3</sup>	17.9	-7.1	35.0	18.0	-6.1	0.01

<sup>1</sup> Since corona effects are produced as a result of system voltage, the corona effects will be the same for all system currents (loads).

<sup>2</sup> Calculation assumes a 1.0 mph perpendicular wind and a 0.05 inch/hr rain.

<sup>3</sup> Bottom conductor.

TABLE 4-1 (continued)

Calculated Corona Effects for the Gering-Stegall  
Double Circuit Transmission Line Project<sup>1</sup>

	Voltage, kilovolts (kV)	ROW Width, feet	Average Conductor Height Above Ground, feet	Average Wet-weather Audible Noise at Edge of ROW, decibels A-weighted (dBA)	Average Fair-weather Audible Noise at Edge of ROW, decibels A-weighted (dBA)	Average Wet-weather Radio Interference (RI) at Edge of ROW, decibels above 1 microvolt per meter (dBµV/m)	Average Fair-weather Radio Interference (RI) at Edge of ROW, decibels above 1 microvolt per meter (dBµV/m)	Wet-weather Television Interference (TVI) at Edge of ROW, decibels above 1 microvolt per meter (dBuV/m)	Maximum Incremental Ozone-levels at Ground Level, parts per billion (ppb) <sup>2</sup>
Option B, Table 4-2	115	80	33 <sup>3</sup>	23.5	-1.5	40.8	23.8	1.6	0.02
<hr/>									
Option C, Table 4-2	115	52	33 <sup>3</sup>	28.8	3.8	47.6	30.6	7.1	0.03
<hr/>									
Option D, Table 4-2	115	52	33 <sup>3</sup>	25.2	0.2	45.4	28.4	4.9	0.02

<sup>1</sup> Since corona effects are produced as a result of system voltage, the corona effects will be the same for all system currents (loads).

<sup>2</sup> Calculation assumes a 1.0 mph perpendicular wind and a 0.05 inch/hr rain.

<sup>3</sup> Bottom conductor.

TABLE 4-2

Calculated Field Effects for the Gering-Stegall 115-kV Double Circuit Transmission Line Project

	Existing Gering-Stegall 115-kV North system with 397.5 MCM Conductor, 80-ft ROW		Existing Gering-Stegall 115-kV South system with 397.5 MCM Conductor, 50-ft ROW		North and South 115-kV Double Circuit System, Normal Phase with 397.5 MCM Conductor, 80-ft ROW, Cross-Arm Design Option A		North and South 115-kV Double Circuit System, Inverse Phase with 397.5 MCM Conductor, 80-ft ROW, Cross-Arm Design Option B		North and South 115-kV Double Circuit, Inverse Phase 397.5 MCM Conductor, 52-ft ROW, Post Insulator Design Option C	
	1	2	1	2	1,4	2,4	1,4	2,4	1,4	2,4
Voltage, kilovolts (kV)	115	115	115	115	115	115	115	115	115	115
Current, amperes (A) <sup>5</sup>	194	385	186	353	194	385	194	385	194	385
Minimum conductor height above ground, feet	24.4	23.8	24.4	23.9	23.1	22.3	23.1	22.3	23.1	22.3
Maximum electric field, kilovolts per meter (kV/m)	1.4	1.5	1.4	1.5	3.2	2.2	1.4	2.2	1.1	1.8
Electric field at edge of ROW, kilovolts per meter (kV/m)	0.7	0.7	1.3	1.3	0.4	0.4	0.3	0.4	0.5	0.7
Maximum magnetic field, milligauss (mG)	43.4	90.2	41.5	82.2	62.5	85.9	36.1	85.9	27.2	67.2
Magnetic field, at edge of ROW, (mG)	14.2	28.5	24.6	48.2	29.9	38.2	8.9	38.2	10.9	42.2

<sup>1</sup> Predicted maximum current with power system intact.

<sup>2</sup> Predicted maximum current based on an outage of one line or other element in power system.

<sup>3</sup> Single-circuit (1 ckt).

<sup>4</sup> The transmission line design criteria would be based on maintaining a minimum conductor to ground height of 22 feet with a conductor temperature of 80°C. This condition would be expected to occur with a 397.5 MCM conductor maximum current of 435 amperes based on a conductor temperature rise of 40°C above a 40°C ambient air temperature. It is not anticipated that actual system operating currents would ever reach this conductor maximum.

<sup>5</sup> All the given system operating currents are projected values calculated from the system planning studies used to authorize the project.

<sup>6</sup> The magnetic fields associated with high pressure pipe type cable is negligible, and the electric field is zero above ground.

TABLE 4-2 (continued)

Calculated Field Effects for the Gering-Stegall 115-kV Double Circuit Transmission Line Project

	North and South 115-kV Double Circuit, Inverse Phase 397.5 MCM Conductor 52-ft ROW, Cross-Arm with Strut Insulator Design Option D <sup>1,4</sup> 2,4		North and South 115-kV HPOF Underground <sup>6</sup> Option E	
	Single Pole Steel	Single Pole Steel	Two Parallel Trenches	Two Parallel Trenches
Voltage, kilovolts (kV)	115	115	115	115
Current, amperes (A) <sup>5</sup>	194	385	385	385
Minimum conductor height above ground, feet	23.1	22.3	—	—
Maximum electric field, kilovolts per meter (kV/m)	1.3	2.1	0	0
Electric field at edge of ROW, kilovolts per meter (kV/m)	0.7	0.9	0	0
Maximum magnetic field, milligauss (mG)	31.0	85.8	negligible	negligible
Magnetic field, at edge of ROW, (mG)	13.8	56.5	negligible	negligible

<sup>1</sup> Predicted maximum current with power system intact.

<sup>2</sup> Predicted maximum current based on an outage of one line or other element in power system.

<sup>3</sup> Single-circuit (1 ckt).

<sup>4</sup> The transmission line design criteria would be based on maintaining a minimum conductor to ground height of 22 feet with a conductor temperature of 80°C. This condition would be expected to occur with a 397.5 MCM conductor maximum current of 435 amperes based on a conductor temperature rise of 40°C above a 40°C ambient air temperature. It is not anticipated that actual system operating currents would ever reach this conductor maximum.

<sup>5</sup> All the given system operating currents are projected values calculated from the system planning studies used to authorize the project.

<sup>6</sup> The magnetic fields associated with high pressure pipe type cable is negligible, and the electric field is zero above ground.

line) for the existing single circuit H-frame design, under maximum current with the power system intact.

The proposed routing for the new double circuit transmission line would reduce the number of residences exposed to EMFs. Overall, the project would provide several benefits relative to reducing potential safety hazards and reducing EMFs. However, the electric and magnetic fields associated with either the existing single circuit transmission lines or for the proposed double circuit transmission line are not anticipated to adversely affect public health nor adversely effect public safety.

### **4.1.3 Socioeconomics**

#### **4.1.3.1 Population and Demographics**

The proposed project would result in a small short-term increase in population in Gering, due to employment of contract construction workers. As described in Section 2.8.2, the number of workers that would be employed would be approximately 12-16 during the peak of construction. Assuming all of the workers temporarily relocate to Gering with their families, the increase in the local population would be approximately 25 - 30 people and would be insignificant, relative to the current population of 7,946 in Gering. A temporary increase in population of 30 people would represent an increase of less than 1 percent.

#### **4.1.3.2 Housing**

The Proposed Action would require an easement width of 52 feet. Western has offered to purchase the affected homes and relocate property owners within the easement boundaries as required under the Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970. At the present time, it is unclear how many households will participate in the acquisition program and will be relocated as a result of the proposed project. Since Western would compensate and relocate any households that would be acquired as a result of the project, housing-related impacts would be mitigated to a level of insignificance. Homeowners currently located within the proposed project easement may elect not to sell their homes to Western and could remain permanently, although the construction of the proposed project may result in considerable disturbance (e.g., noise, dust, and intrusion by workers) for a limited

period of time. Western would secure a new easement with landowners affected by the proposed project.

As previously described, construction of the proposed project could temporarily increase the local population by as many as 12 families or 25 - 30 people. Based on housing data available in the U.S. Census (133 vacant housing units), it is likely that there would be an adequate supply of housing available for both workers who would migrate to Gering during the construction phase of the project and those property owners situated within the ROW of the Proposed Action who would elect to sell their property to Western.

#### **4.1.3.3 Community Resources**

Construction, operation, and maintenance of the proposed project should not increase or decrease the need for police, fire, medical, or other community resources in the project area. Although construction of the project could temporarily increase the local population by as much as 12 households or 25 - 30 people, the increased demand for services by those residents would be insignificant.

#### **4.1.3.4 Economy**

It is unlikely that the proposed project would have a perceptible impact on the study area economy because there should be little or no reduction in local agricultural production and tourist visitation to the Scotts Bluff National Monument should not change. Although Western would utilize a contractor to construct the proposed transmission lines and the project would thereby increase local employment, the short-term nature of project construction and the limited number of workers employed should result in limited positive economic impacts to the City of Gering in the form of increased spending on lodging, meals, and other consumers goods and services.

#### **4.1.3.5 Executive Order 12898**

On February 11, 1994, Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was published in the Federal Register (59 FR 7629). The Order requires federal agencies to identify and address

disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Currently, no formal guidelines have been adopted to implement the Executive Order; however, EPA has published relevant studies and information on environmental justice and is leading an interagency task force to address the issues of environmental justice. DOE is a participating member of this task force. In July 1993, DOE distributed a memorandum stating the Department's commitment to environmental justice, providing information to better understand environmental justice issues, and requesting input on how DOE should consider environmental justice in its NEPA documents (DOE Memorandum of July 22, 1993, from the Office of NEPA Oversight).

The Gering-Stegall EA was prepared with these guidelines in mind. The Gering-Stegall transmission lines identified for consolidation are located within an area characterized by a uniform population. About half the project area is within residential, commercial and community areas, while the other half is mostly agricultural. This population is represented by a limited range of middle income levels and fairly uniform backgrounds. Therefore, this project will not disproportionately impact minority and low-income populations.

#### **4.1.4 Cultural Resources**

Construction of the Proposed Action would not impact any significant archaeological or historic sites. Significance is defined as eligible for or listed on the National Register of Historic Places. The archaeological sites recorded on Scotts Bluff National Monument are not within the Proposed Action, and there will be no impact to the monument itself. The three canal segments are potentially eligible for the National Register, but would be spanned by the Proposed Action. They would not be impacted. The corrals and stables site would be impacted by Proposed Action, however the site does not appear to exhibit any qualities that would make it eligible for the National Register and is therefore not significant. There is no evidence of the historic structure at the Gering High School. The Archer-Stegall transmission line remnant has no integrity and no historic significance. It has no qualities that would make it eligible for the National Register. The Severin Sorensen House is listed on the National Register, but is located outside the Proposed Action, and there would be no impact to the site. In summary, the Proposed Action would have "no effect" on significant cultural resources.

For compliance with the National Historic Preservation Act, Section 106, Western consulted with the Nebraska State Historic Preservation Officer (SHPO) concerning the National Register eligibility of sites within the Proposed Action. On May 9, 1995, the SHPO concurred with Western's determination that no historic properties will be affected by the project. Western also consulted with the NPS concerning impacts to potentially eligible sites.

The various alternatives would have the same effects as the Proposed Action.

#### **4.1.5 Visual Resources**

Impacts to visual resources would occur if visual contrasts are identified for landscape modifications affecting the following: the quality of any scenic resources; scenic resources having rare or unique values, and; views from, or the visual setting of, travel routes, natural areas or any sensitive land use.

Impacts are evaluated by assessing the amount of contrast created between the proposed transmission line and the existing visual quality, land use and visibility. Contrasts to visual quality are determined by analyzing existing landscape features (landforms, water features, vegetation and structures) and how these features would be changed or modified by the proposed action. Contrasts to land uses would occur if the action would introduce a type of land use either not previously existing in the area or incompatible with existing uses.

Visibility and visual impacts of the Proposed Action were assessed in part by selecting representative viewpoints within the study area and preparing photographic simulations of the proposed line. The visual simulations were based on use of twelve structures at eleven locations; the actual number of structures may be 11 to 14. Appendix F contains a map (Figure F-1), showing the location of the viewpoints, and photographs from each location showing both the existing scene and simulated views of the proposed transmission line. Representative viewpoints were selected for viewers within the City of Gering, and viewers in Scotts Bluff National Monument. Locations within the City of Gering included:

- Location 3 - Highway 71 near U Street, looking northwest toward Scotts Bluff National Monument
- Location 4 - U Street, looking east

- Location 5 - Gering High School Parking Lot, looking south
- Location 6 - View southeast across Gering High athletic field and parking lot

Locations from Scott Bluff National Monument were:

- Location 1 - View east-southeast from parking lot on top of Scotts Bluff
- Location 2 - View east-southeast from South Overlook on Scotts Bluff
- Location 7 - View east-northeast from Scotts Bluff National Monument Visitors Center

The Proposed Action would generally have moderately positive visual impacts. Removal of the 31 H-frame structures would reduce the amount of vertical line contrasts existing in the landscape. The new single steel poles would tend to consolidate the visual contrasts, changing the view from one that has many, lower intensity contrasts to one with fewer. However the size of the new steel structures would be noticeably larger than the H-frame structures. There are a number of other transmission lines and other structures in the vicinity of the Proposed Action, and the Proposed Action would not result in substantial changes in the visual landscape of the study area.

Views from Scotts Bluff National Monument would generally encompass only a portion of the Proposed Action. From the South Overlook, all of the structures of the Proposed Action would be hidden behind a peninsular landform extension of Scotts Bluff. The visual change would create a positive effect from removal of one H-frame, resulting in a net decrease in 2 vertical poles within the view. However, there are a number of other transmission line structures evident in the view from the South Overlook, and the visual improvement would be slightly additive.

Views from the parking lot on top of Scotts Bluff would encompass most of the project area, in a middleground to background distance zone. However, due to the distance and the urban backdrop of the view, only the western 2 or 3 new structures would be visually evident. There would be a moderately positive impact due to removal of 10 structures from within the middle view (0.5 to 1.0 mile). However, the highly modified landscape of the view would tend to reduce the significance of any visual change: the westernmost structure would be in agricultural land, and the next two structures east will be adjacent to a landfill.

The Proposed Action would be hardly visible from the Scotts Bluff National Monument Visitors Center, due to distance and foreground topographic screening. Due to a low ridge in between the project area and the Visitors Center, only the upper half of the transition structure would be visible, and all of the other new structures would be hidden from view. The partial view of the transition structure would be insignificant compared to other more visually evident vertical elements on the horizon. The result would be no noticeable beneficial or adverse effects.

Views from the trail from the parking lot on top of Scotts Bluff to the Visitors Center would be generally similar to those from the parking lot, but from a lower angle. No portion of the Proposed Action would be visible from the North Overlook on Scotts Bluff.

Six or seven of the new structures would be located immediately adjacent to U Street within the urban portion of the City of Gering. The new larger scale structures would be wider and taller than the poles of the existing H-frame structures. However, since the proposed action involves removal of 15 structures from within the urban area and replacing them with significantly fewer but more massive structures, the overall visual impact is likely to be about the same as under existing conditions. The simulations from locations 4, 5 and 6 demonstrate the changes likely to occur. The quality of views would be affected somewhat by the viewer's position. Linear views down U Street where the viewers may see a line of the new structures would result in about the same visual impact as existing conditions, due to the large size and scale of the new structures. Views that are perpendicular to the existing H-frame lines, such as those shown from photo location 5, would be somewhat improved by the removal of three rows of wood poles and concentration of the visual contrasts. Views from residential properties along the three existing transmission lines would be similarly improved. The new structures would be located only on the north side of U Street. Existing power and telephone lines would remain in place on the south side of U Street. There are numerous other existing urban modifications which make U Street relatively non-sensitive to visual modification.

Five or six structures would be located along U Street west of the urban area, in vacant land, landfill, and agricultural field. The simulation from Highway 71 (location 3, photos 7 and 8) shows the appearance of the proposed action against the backdrop of Scotts Bluff. In general, the Proposed Action would have less visual contrast than the three existing

transmission lines, due to removal of wooden H-frame structures. The view would still have many visual contrasts due to other utility lines not part of this project. From U Street itself, views are likely to improve with the removal of numerous H-frames.

There are several design alternatives which affect visual resources, including structure color, structure design, and transition structure design.

**Structure color alternative:** The Proposed Action involves use of a dull grey galvanized steel, while the alternative color is weathering steel, a dark rust-colored oxidized steel. Two simulations were prepared in order to evaluate the relative visual impacts associated with these two colors. The relative visibility of the two colors would vary depending on sun angle, weather conditions, and backdrop. For urban locations in general, galvanized steel color would be less visually evident than the weathering steel color, especially in town and under snowy conditions. This color is more predominant for nearby facilities and structures. It would be less evident than weathering steel when viewed with the sun behind the viewer (i.e., viewer looking at the sunny side). When viewed with the sun behind the structures (i.e., viewer looking at the shade side), the two colors would appear similar and there would be no significant difference. This is demonstrated in Photo 13, which shows a galvanized steel pole being illuminated by an afternoon sun, with most of the visible surface in shadow. The darker colored weathering steel structures may be somewhat less visible when viewed from Highway 71 against the backdrop of Scotts Bluff.

**Structure design alternative:** The Proposed Action includes use of the post insulator configuration. All of the photographic simulations were made using the alternative parallel crossarm design, which has a wider silhouette (Figure 2-3) and is more evident visually than the post insulator design. The post insulator would create a more compact appearance of the structure.

**Transition structure design alternative:** The Proposed Action involves use of two single pole steel structures for the transition structure. The transition structure design alternative involves use of a shorter but bulkier steel angle structure at the same location. The relative visual impacts associated with these alternative designs was investigated using the photographic simulation process for viewers from the top of Scotts Bluff Monument (Appendix F, photos 4 and 5). The Proposed Action is somewhat less visually evident than the alternative design

as viewed from the top of the monument.

## **4.2 BIOLOGICAL RESOURCES**

### **4.2.1 Threatened and Endangered Species**

As described in Section 3.5.1, two endangered species were identified as potentially occurring in the study area, bald eagle and peregrine falcon.

#### Bald Eagle

Although bald eagles winter and nest in the region, they are likely to occur only rarely at or near the location of the proposed project due to unfavorable habitat. Bald eagles prefer riparian woodlands, as found along the North Platte River. The proposed consolidated transmission line would be located mostly in urban and agricultural areas, more than a mile from the North Platte River. Transitory occurrences of bald eagles flying over the study area could, however, be expected. Potential impacts to transitory bald eagles include electrocution and collision.

Electrocution of bald eagles is not expected to be a problem due to the large size and design of the transmission line, the absence of nests or winter roosts nearby, and the unfavorable habitat. On larger transmission lines, such as the proposed consolidated line, conductors are further apart than on smaller lines. With the conductors further apart, a bird landing or perching on the transmission line is less likely to be electrocuted.

Collisions of raptors with transmission lines is not a common problem, especially for slow-flying raptors like eagles (Olendorff et al. 1981). Bald eagles have the greatest potential for collision with transmission lines in mid-span areas where lines cross open expanses of water (Faanes 1987), a situation not associated with the Proposed Action.

The Proposed Action should have no effect on bald eagles and no mitigations are recommended.

Impacts to threatened, endangered rare or sensitive species would be the same under all

alternatives.

### Peregrine Falcon

Peregrine falcons may occur occasionally in the project area during migration. However, they are unlikely to hunt or feed in the immediate vicinity of the Proposed Action because of the unfavorable habitat (mostly urban and agricultural land), and the presence of more favorable feeding habitat elsewhere in the region. Any peregrines occurring in the general area are most likely to hunt in riparian and wetland habitats such as the North Platte River, where waterfowl and shorebirds are found.

The Proposed Action should have no effect on peregrine falcons and no mitigations are recommended.

### Other Sensitive Species

Loggerhead shrikes, a federal category 2 candidate species, may potentially occur anywhere along the project route, especially in shrubby areas. Impacts are expected to be minimal, because there will be no loss of habitat, and nesting is unlikely to occur in the areas lacking natural vegetation. Although two of the structures would be placed in areas mapped as "vacant" for land use, the structures would be placed on weedy uplands adjacent to U Street, and not on the shrub-dominated slopes of the gullied land.

Ferruginous hawk and fringe-tailed myotis may occur in the project area during migration, although their presence has not been documented. The Proposed Action is unlikely to have any impacts on these species, if they occur, because there would be no loss of habitat.

Great blue heron and golden eagle are Nebraska species of special concern known to occur at Scotts Bluff National Monument. The Proposed Action is also unlikely to have any adverse effects on them, because there would be no loss of habitat, and no construction near key habitat features (nests and rookeries).

Some of the rare plant species reported from Scotts Bluff National Monument could potentially occur within the small portion of the Proposed Action that is within Scotts Bluff

National Monument. There would be no structure removals or construction on monument grasslands, and the only construction activity would be reductoring of the existing turning structure. This would involve use of rubber-tired vehicles operating within the ROW. Although there would be temporary crushing of vegetation and minor compaction of soils in limited areas (maximum of about 0.35 acre), impacts to grasslands are expected to be negligible.

For compliance with the Threatened or Endangered Species Act, Section 7, Western consulted with the U.S. Fish and Wildlife Service concerning the effect of the project on threatened or endangered species and critical habitat. On April 26, 1995 the U.S. Fish and Wildlife Service concurred with Western's determination that the project will not affect federally listed threatened and endangered species or their critical habitat. On May 2, 1995 the Nebraska Game and Parks Commission also concurred with this determination.

Impacts to threatened, endangered, rare, or sensitive species would be the same under all alternatives.

#### **4.2.2 Wetlands/Important Habitats**

The only wetlands are found in the northern part of the study area, nearly one mile from the proposed route. Since no wetlands occur in or adjacent to the proposed route, the Proposed Action would have no effect on wetlands and no mitigations are recommended.

The proposed project is unlikely to affect other important habitats within the study area, which include the native mixed-grass prairie, shrub dominated slopes, and pine-studded bluffs at Scotts Bluff National Monument. The proposed project would tie into the existing structures at the monument boundary, but new structures would not be erected inside the monument boundary. There would be temporary and minor impacts to the native mixed-grass prairie habitat at the monument boundary when connecting the proposed transmission line to the existing Gering-Stegall North and Gering-Stegall South transmission lines due to crushing of vegetation by vehicles.

Impacts would be the same for the Proposed Action and all alternatives.

## **4.3 EARTH RESOURCES**

### **4.3.1 Water Resources**

No impacts to surface water resources would occur as a result of the proposed project because the transmission lines would span both the Gering Irrigation Canal and the intermittent drainage nearby. Transmission line poles would be intentionally located in such a way that both surface water channels would be spanned. Access to the transmission line and various poles would be gained via the existing U Street, which already crosses both channels. As a result, no new disturbance to the banks or channels of the canal and stream would occur.

Western's standard construction practice (Table 2-4) include procedures to prevent soil erosion and spills into surface water bodies. Erosion and spills are therefore unlikely.

There would be no change in impacts from use of the various alternatives.

### **4.3.2 Floodplains**

Since the proposed Gering-Stegall Transmission Line would not cross any designated 100-year or 500-year floodplains, there would be no flood-related impacts associated with the project.

### **4.3.3 Soils**

The proposed route would cross the Mitchell silt loam, 0-1% slopes; Mitchell silt loam, 1-3% slopes; Mitchell silt loam (thin), 1-5% slopes; and gullied land. The Mitchell silt loam soils are prime farmland when irrigated, and have moderate water erosion potential and low to moderate wind erosion potential. The gullied lands have a high water erosion potential and low to moderate wind erosion potential.

Under the proposed action, 31 structures would be removed and replaced with 11-14 new structures. Starting from the substation, six or seven of the structures would be located immediately adjacent to U street in an already urbanized area. There would be short-term, minor impacts to soils due to compaction on lawns and the playing field. Such impacts are

addressed by Western's standard construction practices which include loosening compacted soils (see Table 2-4).

The next four new structures would be located within the gullied land soil series. Two of the structures are adjacent to the landfill. Approximately 900 square feet would be disturbed around each of the structures during construction and removal. Construction and removal of structures in the gullied land soil series is not expected to result in significantly increased soil erosion because structures would be placed on stable upland areas that occur within this soil series, not within gullies or on steep slopes. In addition, Western's standard construction practices (see Table 2-3) call for preventing erosion and restoring land as nearly as practical to the original condition. Some of these mitigation measures include obliterating ruts, loosening compaction, constructing water turnoff bars, and revegetating disturbed areas. Some minor water and/or wind erosion could occur during construction and removal if conditions permit (i.e., precipitation event or high winds) prior to establishment of vegetation.

The remaining new structures would be located in agricultural land made up of the Mitchell silt loam, 1-3% slopes and Mitchell silt loam (thin) 1-5% slopes soil map units. During construction and removal, minor short-term impacts to soils would likely occur. Approximately 900 square feet around each structure would be disturbed, as well as the traveled access areas between structures. Potential impacts include compaction and possible water and wind erosion if conditions permit (i.e., precipitation event or high winds), although the affected soils have moderate and low to moderate potential for wind and water erosion, respectively. Western's standard construction practices (see Table 2-3) include loosening compaction and preventing erosion. After construction, slightly more prime farmland would be available for cultivation since fewer transmission line structures would be located in prime farmland, than under current conditions.

The various design alternatives would have the same effects as the Proposed Action.

## CONSULTATION AND COORDINATION

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### 5.1 LIST OF AGENCIES CONTACTED

#### National Park Service - Scotts Bluff National Monument

Larry Reed	Superintendent
Robert Manasek	Resource Management Specialist
Palma Wilson	Chief Ranger

#### U.S. Fish and Wildlife Service

Steven Anschutz	Nebraska State Supervisor
Wally Jobman	Acting Nebraska State Supervisor
Erika Wilson	Biologist

#### USDA, Soil Conservation Service

Larry Ragon	Assistant State Soil Scientist
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#### U.S. Census Bureau

Pat Rodriguez	
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#### Nebraska Game and Parks Division, Lincoln Nebraska

Gerry Steinauer	Community Ecologist
Mary Kay Clausen	Heritage Zoologist
John Diamond	Raptor Biologist
Mike Fritz	Biologist

#### Nebraska State Historical Society

James A. Hanson	State Historic Preservation Officer
L. Robert Puschendorf	Deputy State Historic Preservation Officer

#### Nebraska Department of Environmental Control

Dennis Grams	Director (former)
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Scotts Bluff County

Lon Darnell

Director of Planning and Zoning

City of Gering

Don Baird

City Administrator

Pam Richter

Building and Zoning

Jim Payne

Supervisor, Electrical Department

North Platte NRD

Ron Cacek

## **5.2 MEETINGS/WORKSHOPS**

March 30, 1993

Meeting with Scotts Bluff National Monument

June 28, 1993

Meeting with Scotts Bluff National Monument

June 28, 1993

Meeting with City of Gering

November 4, 1993

Meeting with personnel from Scotts Bluff National Monument  
and City of Gering

February 4, 1994

Public meeting at Gering Civic Center

## **5.3 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE ASSESSMENT ARE SENT**

Mr. Larry Reed

National Park Service

Superintendent

Scotts Bluff National Monument

P.O. Box 27

Gering, NE 69341-0027

Mr. Wally Jobman

Acting Nebraska State Supervisor

U.S. Fish and Wildlife Service

Nebraska/Kansas Field Office

203 West Second Street

Grand Island, NE 68801

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**APPENDIX A**  
**EMF BIBLIOGRAPHY**

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**APPENDIX A**  
**EMF BIBLIOGRAPHY**

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**APPENDIX B**  
**GLOSSARY, ACRONYMS, AND ABBREVIATIONS**

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**APPENDIX B**

**GLOSSARY, ACRONYMS, AND ABBREVIATIONS**

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AN	Audible noise
dba	decibel
DNA	Deoxyribonucleic acid
EA	Environmental assessment
EMF	Electric and magnetic fields
FEMA	Federal Emergency Management Agency
Hz	Hertz
KOP	Key observation point (for visual resources)
kV	Kilovolt
m	Meter
mG	milligauss (unit measurement of magnetic field strength)
NESC	National Electrical Safety Code
NPS	National Park Service
NWI	National Wetland Inventory
ppb	parts per billion
RI	Radio interference
RNA	Ribonucleic acid
ROW	Right-of-way
SCS	U.S. Department of Agriculture, Soil Conservation Service
TVI	Television interference
USFWS	U.S. Department of the Interior, Fish and Wildlife Service
USGS	U.S. Department of Interior, U.S. Geological Survey
Western	U.S. Department of Energy, Western Area Power Administration

**APPENDIX C**  
**AGENCY LETTERS**

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# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Fish and Wildlife Enhancement  
Nebraska/Kansas Field Office  
203 West Second Street  
Grand Island, Nebraska 68801

May 11, 1993

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J0005	✓	
T0400	✓	12/19
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Mr. Stephen A. Fausett  
Area Manager  
Western Area Power Administration  
Loveland Area Office  
P.O. Box 3700  
Loveland, CO 80539-3003

Dear Mr. Fausett:

This responds to your May 5, 1993, letter requesting comments from the U.S. Fish and Wildlife Service (Service) on a proposal to consolidate segments of two transmission lines near the Gering Substation, Scotts Bluff County, Nebraska. These comments are provided as technical assistance and predevelopment consultation and do not constitute a Service report under authority of the Fish and Wildlife Coordination Act (Coordination Act) (16 U.S.C. 661 et seq.) on any required Federal environmental review or permit.

We have determined that pursuant to Section 7(c) of the Endangered Species Act of 1973, the following federally listed threatened and endangered species, proposed species, and candidate species may occur in Scotts Bluff County, Nebraska:

<u>Listed Species</u>	<u>Expected Occurrence</u>
Bald eagle ( <u>Haliaeetus Leucocephalus</u> )	Migration, winter resident
Peregrine falcon ( <u>Falco peregrinus</u> )	Migration

### Proposed Species

None

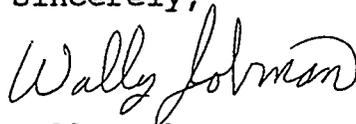
Bald eagles utilize mature riparian timber near streams and lakes. Eagles are widely scattered along the North Platte River during the winter. Peregrine falcons generally are associated with wetlands and open areas such as cropland and grassland. Most observations in Nebraska are in late April to early May, September, and October. Peregrines have been confirmed at Scotts Bluff National Monument.

We are enclosing a list of the Category 2 candidate species which may be found in Scotts Bluff County, Nebraska. Category 2

candidate species are those for which the Service is seeking additional information in order to determine their biological status; few Category 2 candidate species ultimately are proposed for listing. Candidate species have no legal protection under the Endangered Species Act and are included in this correspondence for planning purposes only.

Should you have any further questions, please contact Mr. Wally Jobman of our staff at (308)382-6468. Thank you for the opportunity to offer comments.

Sincerely,

A handwritten signature in cursive script that reads "Wally Jobman".

Wally Jobman  
Acting Nebraska State Supervisor

Enclosure

cc: NGPC; Lincoln, NE (Attn: Curt Twedt)

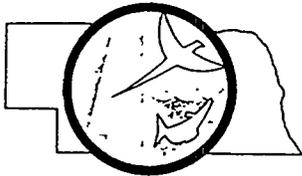
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Category 2 Candidate Species Which May Occur in Scotts Bluff County, Nebraska

Vertebrate and Invertebrate Wildlife Listing

(Federal Register, Volume 56, No. 225, November 21, 1991,  
Pages 58804-58836)

Category	Common Name	Scientific Name	Family
2	Belfragi's chlorochroan bug	<u>Chlorochroa belfragi</u>	Pentatomidae
2	Ferruginous hawk	<u>Buteo regalis</u>	Accipitridae
2	Northern goshawk	<u>Accipiter gentilis</u>	Accipitridae
2	Mountain plover	<u>Charadrius montanus</u>	Charadriidae
2	Loggerhead shrike	<u>Lanius ludovicianus</u>	Laniidae
2	Harlequin duck	<u>Histrionicus histrionicus</u>	Anatidae
2	Swift fox	<u>Vulpes velox</u>	Canidae
2	Fringed-tailed myotis	<u>Myotis thysanodes pahasapensis</u>	Vespertilionidae
2	Plains spotted skunk	<u>Spilogale putorius interrupta</u>	Mustelidae



# Nebraska Game and Parks Commission

2200 N. 33rd St. / P.O. Box 30370 / Lincoln, NE 68503-0370 / (402) 471-0641

6

May 20, 1993

Mr. Stephen A. Fausett  
Department of Energy  
Western Area Power Administration  
P.O. Box 3700  
Loveland CO 80539-3003

OFFICIAL FILE COPY		
WESTERN		
Loveland Area Office		
MAY 24 1993		
No Reply Necessary	Initial	Date
Reply or Other Action Taken	Code No.	Date
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Dear Mr. Fausett:

We Have reviewed Western Area Power Administration's plan to consolidate segments of two transmission lines near the Gering substation in Gering, Nebraska for impact on endangered or threatened species. Two species the peregrine falcon and the bald eagle could be affected by this project.

The federally and state endangered peregrine falcon (Falco peregrinus) occurs as a migrant throughout Nebraska and the federally and state endangered bald eagle (Haliaeetus leucocephalus) occurs as a migrant and winter resident in Nebraska. Both species use power poles for perches and thus are subject to possible electrocutions. By following the guidelines in the publication, Suggested Practices for Raptor Protection on Powerlines, Raptor Research Report #4, Raptor Research Foundation, Inc., 1981, the threat of electrocution to the peregrine falcon, bald eagle and other birds of prey can be avoided.

If we can be of further assistance, feel free to contact us.

Sincerely,

Mary Kay Clausen  
Heritage Zoologist



## Nebraska Game and Parks Commission

2200 N. 33rd St. / P.O. Box 30370 / Lincoln, NE 68503-0370 / (402) 471-0641

July 14, 1993

Chris Freeman  
Environmental Scientist  
Woodward-Clyde Consultants  
4582 S. Ulster St., Suite 1000  
Denver, CO 80237

Dear Mr. Freeman,

Enclosed is the response to your data request of July 1, 1993. The data contains all rare species occurrences in the Nebraska Natural Heritage database for the area covered by the Scottsbluff South topographic map. As the list shows, most of the occurrences are located on the Scotts Bluff National Monument which falls within your project area. None of the species were Federally or state threatened, endangered or candidate species.

This response includes only known occurrences of rare plants and animals within the area covered by the Scottsbluff South topographic map. The area project area could harbor other rare species occurrences. The Heritage database contained no natural community records for the project area. I would advise you contact staff of the Scotts Bluff National Monument to obtain information on natural communities in the area. The only managed area in the project area is the Scotts Bluff National Monument.

This response should not be regarded as a review for threatened or endangered species impact of the project.

Sincerely,

*Gerry Steinauer*  
Gerry Steinauer  
Community Ecologist

enclosure

SCIENTIFIC NAME	COMMON NAME	T/R	SEC	LAST-OBS	FED STAT STA	STAT SITE NAME
**COUNTY: Scotts Bluff						
AERONAUTES SAXATALIS	WHITE-THROATED SWIFT	022N055W	33	1988-08-		SCOTTS BLUFF NM
ATRIPLEX CANESCENS	FOUR-WING SALTBUSH	021N055W	05	1966-06-22		SCOTTS BLUFF NM
ATRIPLEX CANESCENS	FOUR-WING SALTBUSH	021N055W	04	1986-06-21		SCOTTS BLUFF NM
BRICKELLIA GRANDIFLORA	TASSEL FLOWER	021N055W	10	1928-10-26		
CHRYSOTHAMNUS PARRYI SSP HOWARDII	HOWARD RABBIT BRUSH	021N055W	10	1925-09-26		
CHRYSOTHAMNUS PARRYI SSP HOWARDII	HOWARD RABBIT BRUSH	022N055W	33	1983-09-10		SCOTTS BLUFF NM
CRYPTANTHA CANA	MOUNTAIN CAT'S-EYE	021N055W	10	1953-06-18		
CRYPTANTHA CANA	MOUNTAIN CAT'S-EYE	021N055W	05	1966-06-22		SCOTTS BLUFF NM
CRYPTANTHA CANA	MOUNTAIN CAT'S-EYE	022N055W	28	1986-06-21		SCOTTS BLUFF NM
ERIGERON CANUS	HOARY FLEABANE	022N055W	34	1891-07-22		
ERIOGONUM PAUCIFLORUM VAR GNAPHALODE	A WILD-BUCKWHEAT	021N055W		1968-07-17		SCOTTS BLUFF NM
FRITILLARIA ATROPURPUREA	PURPLE MISSION-BELLS	022N055W	33	1891-07-23		SCOTTS BLUFF NM
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IPOMOPSIS CONGESTA	BALL-HEAD STANDING-CYPRESS	022N055W	33	1983-08-23		SCOTTS BLUFF NM
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LOMATIUM NUTTALLII	NUTTALL DESERT-PARSLEY	021N055W	04	1985-05-05		SCOTTS BLUFF NM
NEOTOMA CINEREA	BUSHY-TAILED WOODRAT	022N055W	33	1986-		SCOTTS BLUFF NM
PHACELIA HASTATA VAR LEUCOPHYLLA		021N055W	05	1968-07-17		SCOTTS BLUFF NM
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ZIGADENUS ELEGANS	WHITE CAMAS	022N055W	33	1966-06-22		SCOTTS BLUFF NM



NEBRASKA STATE HISTORICAL SOCIETY  
1500 R STREET, P.O. BOX 82554, LINCOLN, NE 68501-2554  
(402) 471-3270 Fax: (402) 471-3100 Museum Fax: (402) 471-3314

June 22, 1993

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JGZC		

Stephen A. Fausett  
Department of Energy  
Western Area Power Administration  
Loveland Area Office  
P.O. Box 3700  
Loveland, Colorado  
80539-3003

RE: Gering-Stegall North and South Transmission Lines  
HP #9306-045-01

Dear Mr. Fausett:

The proposed project will not have an impact on any significant architectural resources. Also, a review of our records indicates no recorded archaeological sites and no cultural resource surveys of the proposed project area. We concur with the proposal to not conduct archaeological survey within the residential areas of the project. In regard to the possible American Indian groups that may have a concern with this project you may wish to contact the Nebraska Commission on Indian Affairs, P.O. Box 94981, Lincoln, NE 68509, phone 402-471-3475.

As indicated in your letter the National Park Service is being consulted in regard to any impact on Scotts Bluff National Monument. We will reserve our judgement on this matter until we have received the comments of the Park Service. If you have any questions please contact our office.

Sincerely,

  
L. Robert Puschendorf  
Deputy State Historic  
Preservation Officer

GM/be

Mr. James A. Hanson  
State Historic Preservation Officer  
Nebraska State Historical Society  
1500 R Street  
Lincoln, NE 68501

Dear Mr. Hanson:

The Western Area Power Administration (Western) proposes to construct 1.3 miles of 115-kilovolt (kV) double-circuit transmission line for the existing Gering-Stegall North and South transmission lines beginning at the Gering Substation in Gering, Nebraska. Presently, there are three parallel 115-kV transmission lines on separate rights-of-way that terminate at the Gering Substation (Figure 1, enclosed). Western's proposal would include dismantling the Archer-Gering wood-pole line and rebuilding the remaining two lines on double-circuit single-pole steel structures on one right-of-way. One alternative being considered would be to rebuild on Western's existing right-of-way along U Street (Figure 2, enclosed). All existing wood-pole structures would be removed, and 1.3 miles of the Gering-Stegall North and South transmission lines rights-of-way abandoned.

Western is planning to prepare an Environmental Assessment for this action. A public scoping meeting will be held in Gering as part of the environmental process. Public concerns for historic preservation will be solicited at that meeting. Woodward-Clyde (W-C) has been contracted to collect the data and prepare the environmental report. Additionally, W-C and their subcontractor, Western Cultural Resource Management (WCRM), will be collecting information for Western's use in fulfilling their responsibilities under Section 106 of the National Historic Preservation Act.

Western is proposing to do a combined reconnaissance and intensive survey for this project. Based on field visits and examination of photographs, we believe a pedestrian survey of all three lines is not required, as the existing lines cross residences and yards. Most of the structures appear to be of post-World War II construction. Segments of the lines also cross an existing landfill (refer to enclosed map and photos). An intensive, pedestrian survey of the western end of the project is proposed, mainly through cultivated fields. The remainder of the alignments will be driven by the investigator to determine if there are any structures with potential historic significance. The pedestrian survey will be undertaken outside the residential area, in plowed fields, and in any other areas that have a potential for visible prehistoric or historic remains. Prior to the fieldwork, WCRM will conduct a file search with your office and contact others who may have pertinent information about cultural resources in the project area.

Western will also contact American Indian groups that may have a historical interest in the project area. These groups will also be included on the public scoping mailing list. Please advise us as to any particular interested parties (Native American or otherwise) known to your office that might have an interest in this project or this area. Western met with the National Park Service, Scotts Bluff National Monument, on April 30, 1992, and March 30, 1993, to discuss the proposed project and identify concerns. Western will continue conferring with the National Park Service concerning potential project impacts to Scotts Bluff National Monument.

In accordance with 36 CFR 800.4 (a), please advise us of any concerns you may have regarding historic, prehistoric, or ethnographic resources in the project area. We are especially interested if there would need to be changes to the proposed research strategy. Western will notify your office when the public scoping meeting is scheduled. If there are any questions, you may telephone either Rodney Jones at 303-490-7371 or Bill Killam at 303-740-3816.

Sincerely,

Stephen A. Fausett  
Area Manager

Enclosures

cc:  
(with enclosures)  
Mr. Terry Steinacher  
H.P. Archaeologist  
Nebraska State Historical Society  
Fort Robinson Museum  
P.O. Box 304  
Crawford, NE 69339

Mr. Larry Reed  
Superintendent  
Scotts Bluff and Agate Fossil Beds  
National Monuments  
National Park Service  
P.O. Box 27  
Gering, NE 69341

bcc:

(with enclosures)

Mr. William R. Killam  
Cultural Resources Coordinator  
Woodward-Clyde Consultants  
Stanford Place 3, Suite 1000  
4582 South Ulster Street  
Denver, CO 80237-2637

(without enclosures)

B. Karsell, A7200, Golden, CO  
M. Barger, A7200, Golden, CO

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# Nebraska Game and Parks Commission

2200 N. 33rd St. / P.O. Box 30370 / Lincoln, NE 68503-0370 / (402) 471-0641

July 14, 1993

Chris Freeman  
Environmental Scientist  
Woodward-Clyde Consultants  
4582 S. Ulster St., Suite 1000  
Denver, CO 80237

Dear Mr. Freeman,

Enclosed is the response to your data request of July 1, 1993. The data contains all rare species occurrences in the Nebraska Natural Heritage database for the area covered by the Scottsbluff South topographic map. As the list shows, most of the occurrences are located on the Scotts Bluff National Monument which falls within your project area. None of the species were Federally or state threatened, endangered or candidate species.

This response includes only known occurrences of rare plants and animals within the area covered by the Scottsbluff South topographic map. The area project area could harbor other rare species occurrences. The Heritage database contained no natural community records for the project area. I would advise you contact staff of the Scotts Bluff National Monument to obtain information on natural communities in the area. The only managed area in the project area is the Scotts Bluff National Monument.

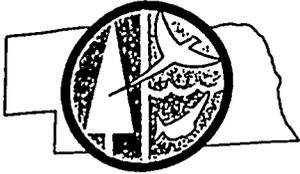
This response should not be regarded as a review for threatened or endangered species impact of the project.

Sincerely,

*Gerry Steinauer*  
Gerry Steinauer  
Community Ecologist

enclosure

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ZIGADENUS ELEGANS	WHITE CANAS	022N055W	33	1966-06-22		SCOTTS BLUFF NM



# Nebraska Game and Parks Commission

2200 N. 33rd St. / P.O. Box 30370 / Lincoln, NE 68503-0370 / (402) 471-0641

July 16, 1993

Chris Freeman  
Environmental Scientist  
Woodward-Clyde Consultants  
4582 S. Ulster St., Suite 1000  
Denver, CO 80237

Dear Mr. Freeman:

I have reviewed your project area in Scottsbluff County near Gering, NE for the presence of endangered or threatened species. There are no known occurrences of endangered or threatened species in your project area, however four species have the potential to occur in the area.

The federally and state endangered black-footed ferret (Mustela nigripes) could occur in prairie dog towns within your project area.

The state endangered swift fox (Vulpes velox) could occur in shortgrass prairie habitat in the proposed project area. I am enclosing a set of guidelines for locating swift fox.

The federally and state endangered peregrine falcon (Falco peregrinus) occurs as a migrant throughout Nebraska and the federally and state endangered bald eagle (Haliaeetus leucocephalus) occurs as a migrant, winter resident and rare nester in Nebraska.

If I can be of further assistance feel free to contact me.

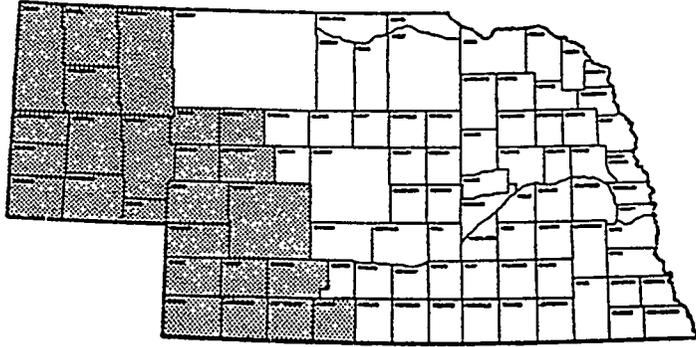
Sincerely,

  
Mary Kay Clausen  
Heritage Zoologist

enclosure

## GUIDELINES FOR LOCATING SWIFT FOX

The swift fox is a small fox found in short-grass prairie regions of western Nebraska. Adults weigh 4-6 pounds and are a pale buffy-yellow color with a bushy, black-tipped tail, large ears, and black patches on each side of the muzzle.



Potential Swift Fox Range in Nebraska

Unlike the coyote or red fox, the swift fox uses dens in the ground throughout the year. These dens can be very helpful in determining the presence of swift fox in an area.

Some characteristics of swift fox dens can distinguish them from dens of other animals. Typically, swift fox den entrances will measure about 8 inches in diameter, approximately the same size as badger dens. Swift fox dens usually have more than one entrance, while dens of badgers and most other animals will more often have a single entrance. Swift fox also tend to spread excavated soil over a larger area than most other animals, resulting in a less prominent "mound" in front of the den entrance. Swift fox dens are normally located on relatively flat ground away from human activity, rather than in road ditches or other cutbanks or near buildings.

If fresh digging activity is discovered that is thought to be that of a swift fox, direct observation should be made to confirm the presence of swift fox. Although primarily nocturnal, swift fox are often active during daylight hours, particularly in early morning and late evening. At those times, swift fox might be observed at or near the den complex. To avoid disturbance and because swift fox are quite shy, they would best be observed from a distance of at least 100 yards using binoculars or a spotting scope.

If pups are observed near a den, positive identification may still be difficult, since swift fox, red fox and coyote pups all look similar when young. For positive identification, adult animals should be observed.



## Nebraska Game and Parks Commission

2200 N. 33rd St. / P.O. Box 30370 / Lincoln, NE 68503-0370 / (402) 471-0641

August 8, 1994

Greg Waldmann  
Woodward-Clyde  
4582 South Ulster Street  
Denver, Colorado 80237

Dear Greg:

I am responding to your faxed request dated August 3, for information from the Nebraska Natural Heritage Database on the Gering-Stegall transmission line consolidation project in the Scottsbluff-Gering Nebraska area. As determined from our August 3 phone conversation, your request was for known or potential occurrence of state listed species and golden eagle and great blue heron rookeries in the project area. A review of our database found no records for these species in or near the project area.

If you have any questions on this project review or need additional information please contact me.

Sincerely,

Michael I. Fritz  
Natural Heritage Botanist  
Nebraska Game and Parks Commission  
2200 N 33rd  
Lincoln, NE 68503

(402)-471-5419



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
Nebraska Field Office  
203 West Second Street  
Grand Island, Nebraska 68801

April 26, 1995

Mr. Stephen A. Fausett  
Area Manager  
Western Area Power Administration  
Loveland Area Office  
P.O. Box 3700  
Loveland, CO 80539-3003

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Dear Mr. Fausett:

This is in response to your April 21, 1995, letter regarding the proposed Gering-Stegall 115-kV Transmission Line Consolidation Project in Gering, Scotts Bluff County, Nebraska.

We concur with your conclusion that the project as currently planned will not affect federally listed threatened and endangered species or their critical habitat. Therefore, no further Section 7 consultation under the Endangered Species Act of 1973 is required with the U.S. Fish and Wildlife Service. However, should plans change, or if additional information on listed or proposed species becomes available, this determination may need to be reconsidered.

If you have further questions, please contact Mr. Wally Jobman within our office at (308)382-6468. Thank you for the opportunity to comment on this proposal.

Sincerely,

Acting *Steven Anschutz*  
Nebraska Field Supervisor

cc: NGPC; Lincoln, NE (Attn: Mark Brohman)

WGJ(7)Gering.ltr



# Nebraska Game and Parks Commission

2200 N. 33rd St / P.O. Box 30370 / Lincoln, NE 68508-0370 / 402-471-0644 / Fax: 402-471-5528

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May 2, 1995

Mr. Stephen Fausett  
Department of Energy  
Western Area Power Administration  
Loveland Area Office  
PO Box 3700  
Loveland CO 80539-3003

**RE: Gering-Stegall 115-KV Transmission Line Consolidated Project in Gering,  
Scotts Bluff County**

Dear Mr. Fausett:

Our agency concurs with your conclusion that the project noted above, as planned, is unlikely to have any adverse effect on any federally listed threatened or endangered species or their critical habitat. Impacts to other resources within our jurisdiction will be minimal or temporary in nature.

If the project is modified, or you have any questions, please call me at (402) 471-5422.

Sincerely,

Mark A. Brohman  
Environmental Analyst Supervisor

MAB/dj



**NEBRASKA STATE HISTORICAL SOCIETY**  
1500 R STREET, P.O. BOX 82554, LINCOLN, NE 68501-2554  
(402) 471-3270 Fax: (402) 471-3100 Museum Fax: (402) 471-3314

May 9, 1995

Mr. Stephen A. Fausett, Area Manager  
Department of Energy  
Western Area Power Administration  
Loveland Area Office  
Box 3700  
Loveland, CO 80539-3003

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RE: Cultural Resources Inventory  
Gering-Stegall Transmission Line Consolidation Project  
Gering, Scotts Bluff Co., NE  
HP #9306-045-01

Dear Mr. Fausett:

The Environmental Assessment for the Gering-Stegall 115-kV Transmission Line Consolidation Project has been reviewed by this office. We concur with the findings that no historic context property resources will be effected by the proposed project. Therefore, according to 36 CFR 800, the project may proceed as planned.

Sincerely,

L. Robert Puschendorf  
Deputy State Historic Preservation Officer

SPN

**APPENDIX D**  
**BIOLOGICAL ASSESSMENT**

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**APPENDIX D**  
**BIOLOGICAL ASSESSMENT**

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Section 7(c) of the Endangered Species Act, as amended, requires federal agencies to determine if their proposed action "may affect" any federally listed threatened or endangered species. This Biological Assessment was prepared by Western Area Power Administration to assess potential impacts to threatened and endangered species, and to meet their obligations under the Endangered Species Act.

The U.S. Fish and Wildlife Service (USFWS), in response to a request from Western Area Power Administration, indicated that two threatened or endangered species and nine candidate species may occur within Scotts Bluff County. This Biological Assessment addresses those species, and three other sensitive species known to occur at Scotts Bluff National Monument or historically present in the area.

#### **D.1 PROJECT DESCRIPTION**

Western Area Power Administration proposes to consolidate segments of two transmission lines near the Gering Substation, in Gering, Nebraska, and to remove a third deactivated transmission line. Presently there are three parallel 115-kV transmission lines on separate rights-of-way (ROW) that terminate at the Gering Substation. The project would include dismantling the Archer-Gering transmission line, and consolidation of the Gering-Stegall North and Gering-Stegall South 115-kV transmission lines onto new single-pole steel double circuit structures. About 1.33 miles of right of way would be affected. Twelve to fourteen new double-circuit steel structures would be constructed, while thirty-one wood pole H-frame structures would be removed.

The proposed transmission line would require an easement of 52 feet, partly overlapping U Street which runs parallel to the proposed route. It would overlap the existing Archer-Stegall right-of-way, but would be 7 feet wider. The new structures would have an average height of 90 feet (compared to 60 feet on the three existing transmission lines), and an average span of 650 feet. About 900 square feet would be disturbed during construction at the base of each structure.

About half of the proposed route passes through urbanized portions of the City of Gering, and most of the rest is agricultural land. Natural grassland habitat is present at the extreme western portion of the project at the eastern edge of Scotts Bluff National Monument, and shrub-dominated slopes occur along minor drainages within the agricultural land. The only construction activity within the grassland habitat at Scotts Bluff National Monument would be re-conducting of existing turning structures.

## **D.2 THREATENED AND ENDANGERED SPECIES**

### **D.2.1 Bald Eagle (*Haliaeetus leucocephalus*)**

The bald eagle is listed as threatened by the U.S. Fish and Wildlife Service (USFWS), and is also listed as endangered by the State of Nebraska.

Most of the bald eagles occurring in western Nebraska are winter residents. Bald eagles utilize mature riparian timber near streams and lakes, and start arriving in November and stay until April. Bald eagles are widely scattered along the North Platte River during the winter. Mid-winter surveys have recorded 10-11 bald eagles in the region from the Wyoming border to the City of Bayard, Nebraska, in surveys from 1992 to 1994 (Jobman 1994). Scottsbluff and the Gering-Stegall Transmission Line project study area are located near the middle of the bald eagle survey area, which extends about 50-60 miles along the North Platte River. Some bald eagles may breed in western Nebraska during the summer, and a new bald eagle nest was found near Lake Ellis about 8 miles north of Scotts Bluff in the spring of 1993 (Jobman 1994).

A comprehensive survey of terrestrial vertebrates was recently conducted at Scotts Bluff National Monument (Cox and Franklin 1989). Bald eagle was reported as a rare migrant in riverine woodland and canal riparian habitat. During the surveys, an adult bald eagle was found dead on April 5, 1988, in the northwest corner of the monument next to a canal. The northwest corner of the monument is mainly canal riparian habitat, and close to the North Platte River (within 0.5 km). A necropsy performed at the National Wildlife Disease Laboratory showed that the eagle died of pulmonary hemorrhage, possibly caused by electrocution.

Nocturnal roost sites are crucial habitat for wintering bald eagles; they are the focal point for bald eagle winter activities, and are traditionally used year after year (Tully 1983). There are no current records of active winter roost sites near the proposed project (Diamond 1994).

Although bald eagles winter and nest in the region, they are likely to occur only rarely at or near the location of the Gering-Stegall Transmission Line, based on habitat. Any occurrences are expected to be transitory, from birds flying over the area. The transmission line is located about 1.25 miles south of the North Platte River, and 1 to 1.5 miles from riparian woodlands and canal riparian habitats where bald eagles would normally tend to occur. In addition, most of the transmission line route crosses through urban and agricultural areas where bald eagles are unlikely to occur. Electrocutation of bald eagles during operation is not expected to be a problem due to the space between conductors and design of the transmission line, the absence of nests or winter roosts nearby, and the unfavorable habitat. Collisions of raptors with transmission lines is not a common problem, especially for slow-flying raptors like eagles (Olendorff et al. 1981). Bald eagles have the greatest potential for collision with transmission lines in mid-span areas where lines cross open expanses of water (Faanes 1987), a situation not present on the proposed action.

The proposed action should have no effect on bald eagles. No mitigations are required.

#### **D.2.2 Peregrine Falcon (*Falco peregrinus*)**

The American peregrine falcon (*F. p. anatum*) is listed as endangered by the USFWS, while the arctic peregrine falcon (*F. p. tundrius*) is listed as threatened. However, all free-flying peregrines in the continental U.S. are listed as endangered under similarity of appearance provisions. Peregrine falcon is listed as endangered by the State of Nebraska.

Peregrine falcons generally are associated with wetlands and open areas such as cropland and grassland. Most observations in Nebraska are in late April to early May, September and October, during migration (USFWS 1993). Peregrines have been confirmed to occur during migration at Scotts Bluff National Monument. There have been two sightings within the monument, one in 1983 (Jobman 1994). The survey of the terrestrial vertebrate species of Scotts Bluff National Monument (Cox and Franklin 1989) did not list this species as either known to occur or potentially present.

Peregrine falcon may occur occasionally in the project area during migration. However, they are unlikely to hunt or feed in the immediate vicinity of the proposed action because of the unfavorable habitat (mostly urban and agricultural land), and the presence of more favorable feeding habitat elsewhere in the region. Any peregrines occurring in the general area are mostly likely to hunt in riparian and wetland habitats such as the North Platte River, where waterfowl and shorebirds are present.

The proposed action should have no effect on peregrine falcons. No mitigations are required.

### **D.2.3 Black-Footed Ferret (*Mustela nigripes*)**

The black-footed ferret is listed as endangered by the USFWS and by the State of Nebraska.

The project area is within the historic range of the black-footed ferret, which originally ranged over twelve states and two Canadian provinces. It is now extirpated from Nebraska, and suitable habitat is not present in the vicinity of the project. Black-footed ferrets are closely associated with prairie dogs (*Cynomys* spp.), using the animals as prey and their burrows as shelter. The nearest known black-tailed prairie dog colonies occur in the northwestern portion of Scotts Bluff National Monument (Reed 1993; Cox and Franklin 1989), about two miles from the western end of the Gering-Stegall Transmission Line Project. In 1987, two colonies had a total of about 300 prairie dogs, and occupied about 21 acres, which is about 1.1% of the grassland habitat at Scotts Bluff National Monument. By 1993, these colonies had reported to cover 40 acres (National Park Service 1993). Black-tailed prairie dogs were absent from the monument from 1942 until they were rediscovered in 1982. All areas along the route of the proposed action were surveyed by foot and vehicle on June 30, 1993. No prairie dog burrows were observed in or near the project area.

The proposed action should have no effect on black-footed ferrets. No mitigations are required.

## **D.3 CANDIDATE SPECIES**

The USFWS (1993) has indicated that several federal candidate species may be found in Scotts Bluff County. All are federal category 2 candidate species, which are defined as

species for which the USFWS is seeking additional information in order to determine their biological status. Candidate species have no legal protection under the Endangered Species Act. Information about these species is summarized in Table D-1. Species recognized by the State of Nebraska as sensitive and known to occur in the project vicinity are also listed in Table D-1.

#### **D.4 SUMMARY**

The proposed action is unlikely to have any adverse effect on any federally listed threatened or endangered species.

One candidate species is likely to occur, loggerhead shrike. The project is not expected to have adverse impacts on this species. Two candidate species, ferruginous hawk, and fringe-tailed myotis may occasionally occur in the project area during migration, but are also unlikely to be affected by the project.

Two species of special concern to the state of Nebraska are known to occur at Scotts Bluff National Monument, and may occasionally occur in the vicinity of the proposed transmission line project. They are great blue heron and golden eagle. The project area does not have habitat features attractive to these species, and occurrence is likely to be sporadic and of short duration. Therefore no adverse impacts are anticipated.

#### **D.5 LITERATURE CITED**

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- Cox, Mike K., and William L. Franklin. 1989. Terrestrial Vertebrates of Scotts Bluff National Monument, Nebraska. Great Basin Naturalist 49(4):597-613.
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- Jobman, Wally G. 1994. U.S. Fish and Wildlife Service, Grand Island, Nebraska. Personal communication to Greg Waldmann, Woodward-Clyde.
- National Park Service. 1993. Environmental Assessment: Stabilizing the Gering Irrigation Canal at Scotts Bluff National Monument, Scotts Bluff, Nebraska. National Park Service, Midwest Region.
- Olendorff, Richard R., A. Dean Miller, and Robert N. Lehman. 1981. Suggested practices for raptor protection on power lines - the state of the art in 1981. Raptor Research Report No. 4, Raptor Research Foundation, Inc.
- Reed, Larry. 1994. Superintendent, Scotts Bluff National Monument. Personal communication to Woodward-Clyde and Western personnel at meeting.
- Tully, Babette. 1983. Bald eagle WRIS resource inventory system northwest Colorado. Colorado Division of Wildlife, Grand Junction, Colorado. 11 pp. (literature review)
- U.S. Fish and Wildlife Service. 1993. Letter from Wally Jobman, Acting Nebraska State Supervisor, to Mr. Stephen A. Fausett, Area Manager, Western Area Power Administration.

TABLE D-1

SUMMARY OF POTENTIAL OCCURRENCE OF FEDERAL  
CANDIDATE AND STATE-LISTED SPECIES

Species	Status Summary of Potential		
	Fed.	State	Occurrence and Impacts
Belfragi's chlorochroan bug <i>Chlorochroa belfragi</i>	C2	-	Only reported once for Nebraska, in 1963, 70 miles north of study area. Generally found in wet prairie habitat, which does not occur in the project area (Jobman 1994).
Ferruginous hawk <i>Buteo regalis</i>	C2	SP	Not known to occur as a resident at Scotts Bluff NM (Cox and Franklin 1989). May occur as a migrant during late September to November (Cox 1994). Adverse effects are unlikely.
Northern goshawk <i>Charadrius montanus</i>	C2	-	Not known or expected to occur at Scotts Bluff NM (Cox and Franklin 1989), and therefore unlikely to occur in the project area.
Mountain plover <i>Charadrius montanus</i>	C2	T	Not known to occur at Scotts Bluff NM (Cox and Franklin 1989) but may occur occasionally as a migrant or transient. Adverse effects are unlikely.
Loggerhead shrike <i>Lanius ludovicianus</i>	C2		Summer resident at Scotts Bluff NM, with breeding not documented; reported to be common on shrub dominated slopes and uncommon in mixed grass prairie (Cox and Franklin 1989). May potentially occur anywhere within the project area. No significant adverse effects are expected, because there will be no loss of habitat, and nesting is unlikely to occur in the areas to be disturbed by construction.

**TABLE D-1**  
**(Continued)**

Species	Status Summary of Potential		
	Fed.	State	Occurrence and Impacts
Harlequin duck <i>Histrionicus histrionicus</i>	C2	-	Not known or expected to occur at Scotts Bluff NM (Cox and Franklin 1989), and therefore unlikely to occur in the project area.
Swift fox <i>Vulpes velox</i>	C2	E	Considered to be extirpated from Scotts Bluff NM (Cox and Franklin 1989), and therefore unlikely to occur in the project area.
Fringe-tailed myotis <i>Myotis thysanodes pahasapensis</i>	C2	-	Not known to occur at Scotts Bluff NM but may occur during seasonal migration (Cox and Franklin 1989). No adverse impacts are expected.
Plains spotted skunk <i>Spilogale putorius interrupta</i>	C2	NC	Not known or expected to occur at Scotts Bluff NM (Cox and Franklin 1989), and therefore unlikely to occur in the project area.
Great Blue heron <i>Ardea herodias</i>	-	SP	Reported as a summer resident (breeding not documented) at Scotts Bluff National Monument; common in riverine woodland and canal riparian habitat (Cox and Franklin 1989). May occasionally fly over the proposed route, but adverse impacts are unlikely due to its remoteness from typical habitat.

**TABLE D-1  
(Concluded)**

Species	Fed.	State	Status Summary of Potential Occurrence and Impacts
Golden Eagle <i>chrysaetos</i>			SP    Reported as a permanent resident at <i>Aquila</i> Scotts Bluff National Monument, with breeding not documented (Cox and Franklin 1989). They are suspected to be breeding on South Bluff (Reed 1993). They may occasionally fly over or feed along portions of the transmission line route, but adverse impacts are unlikely because the project area does not have features attractive to this species, and potential nest sites are several miles away.

**Status:**

C2 = Category 2 candidate species for the federal list of endangered and threatened species. Category 2 species are those for which more information is needed by USFWS to support their listing as threatened or endangered species.

NC = Nebraska species in need of conservation

SP = Nebraska species of special concern

**APPENDIX E**  
**FLOODPLAINS/WETLANDS ASSESSMENT**

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**APPENDIX E**

**FLOODPLAINS/WETLANDS ASSESSMENT**

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This Floodplains/Wetlands Assessment only addresses the Proposed Action, which consists of dismantling of the existing Archer-Gering, Gering-Stegall North and Gering-Stegall South wood-pole transmission lines, and consolidation of the Gering-Stegall North and Gering-Stegall South 115 kV transmission lines onto new single-pole steel double circuit structures. About 1.33 miles of existing transmission line right-of-way would be affected.

In accordance with Executive Orders 11988 and 11990 and U.S. Department of Energy procedures, floodplains and wetlands were identified, mapped, and integrated into the planning and alternatives selection process.

No floodplains or wetlands occur in or adjacent to the route along U Street, and the proposed action will have no effects on floodplains or wetlands.

The following sources of information were used for identification of floodplains:

- Federal Emergency Management Agency Flood Insurance Rate Maps, Scotts Bluff County, Nebraska. Panels 150 and 175. June 18, 1990. 310473 0150A and 0175 A.
- Federal Emergency Management Agency Flood Insurance Rate Map, City of Gering, Nebraska. February 15, 1979. 310371 0005A.

The following sources of information were used for identification of wetlands.

- National Wetlands Inventory map, Scotts Bluff South, Nebraska quad 1992.
- Reconnaissance of the proposed route by an experienced wetland scientist on June 30, 1993.

**APPENDIX F**  
**PHOTOGRAPHIC SIMULATIONS**

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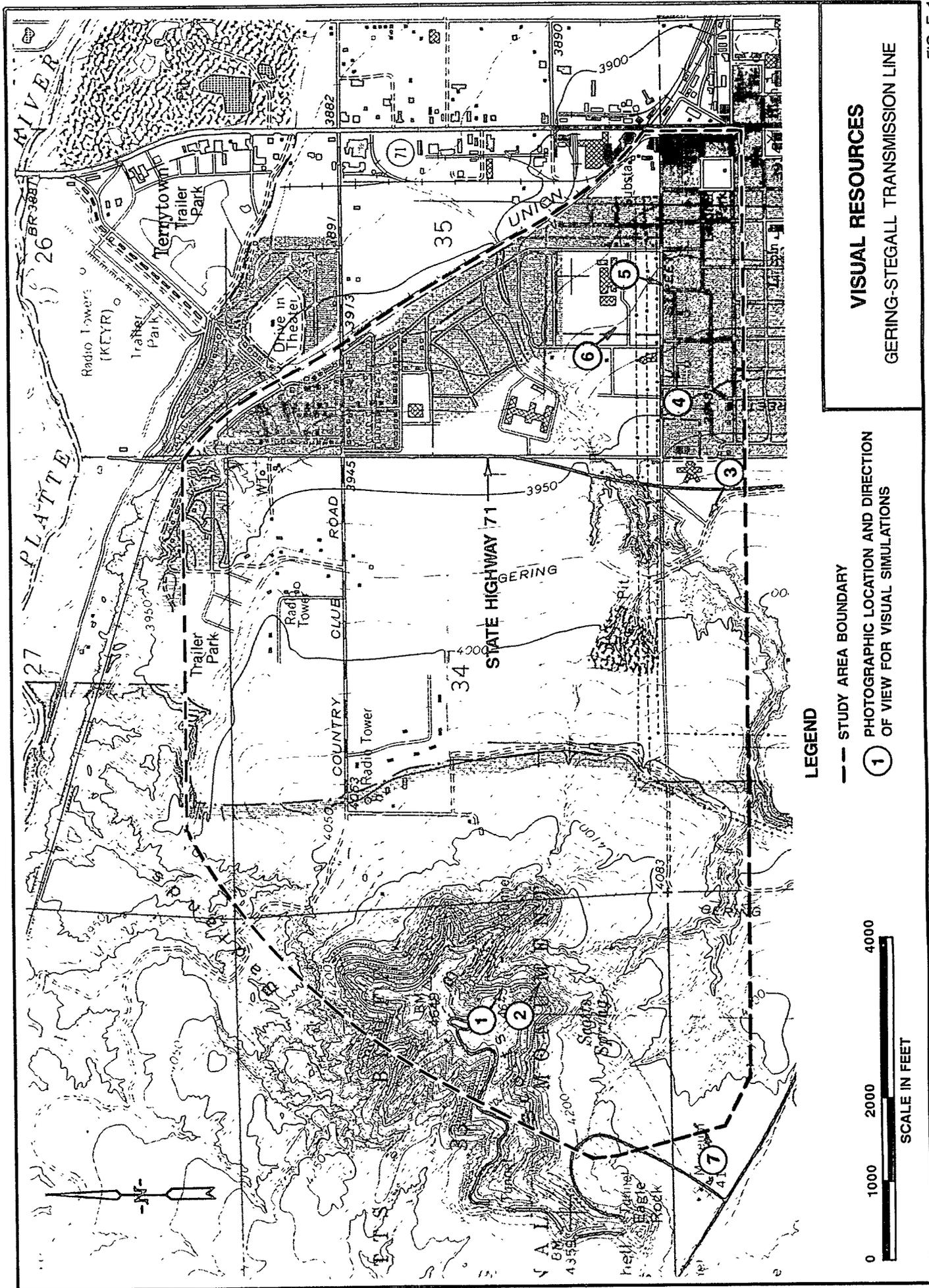
## APPENDIX F

### PHOTOGRAPHIC SIMULATIONS

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The color photographic simulations were prepared to display visual change that the project would create on the existing landscape scene. In addition, key observation points (KOPs) were selected for sensitive viewing locations within Scotts Bluff National Monument. KOPs were selected as representative points where viewers travel, recreate or reside in the study area. The color photographs were recorded in the field with the seven locations displayed on Figure F-1, using a 35 mm camera, 50 mm lens and Kodak Royal Gold 100 film. For each KOP, a color 8 x 12 inch photograph was scanned into a computer. Using Photoshop software the photographic image was manipulated to simulate the post-construction view; taking out the old transmission line structures and replacing them with the new structures. The simulations were created using the parallel crossarm structure design, as a worst case. Numerous photographs were taken of similar transmission line structure types located near the project area and scanned into the computer to borrow the color, texture and shadow patterns and place them onto the simulated photograph.

After several refinements the photographic simulations were reviewed and approved. The magnetic disk tapes containing approximately 33 megabytes of data for each simulation were converted into color negatives and enlarged to an appropriate size for the document and presentation.



**VISUAL RESOURCES**

GERING-STEGALL TRANSMISSION LINE

- LEGEND**
- STUDY AREA BOUNDARY
  - ① PHOTOGRAPHIC LOCATION AND DIRECTION OF VIEW FOR VISUAL SIMULATIONS



FIG. F-1



PHOTO 1 - VIEW OF EXISTING CONDITION FROM PHOTOGRAPHIC LOCATION 1



PHOTO 2 - SIMULATED VIEW OF PROPOSED ACTION FROM PHOTOGRAPHIC LOCATION 1



PHOTO 3 - VIEW OF EXISTING CONDITION FROM PHOTOGRAPHIC LOCATION 2



PHOTO 4 - SIMULATED VIEW SHOWING SINGLE, THICK-STEELLED TRANSITION  
STRUCTURE TAKEN FROM PHOTOGRAPHIC LOCATION 2



PHOTO 5 - SIMULATED VIEW SHOWING TWO SINGLE-POLE STEEL TRANSITION STRUCTURES TAKEN FROM PHOTOGRAPHIC LOCATION 2

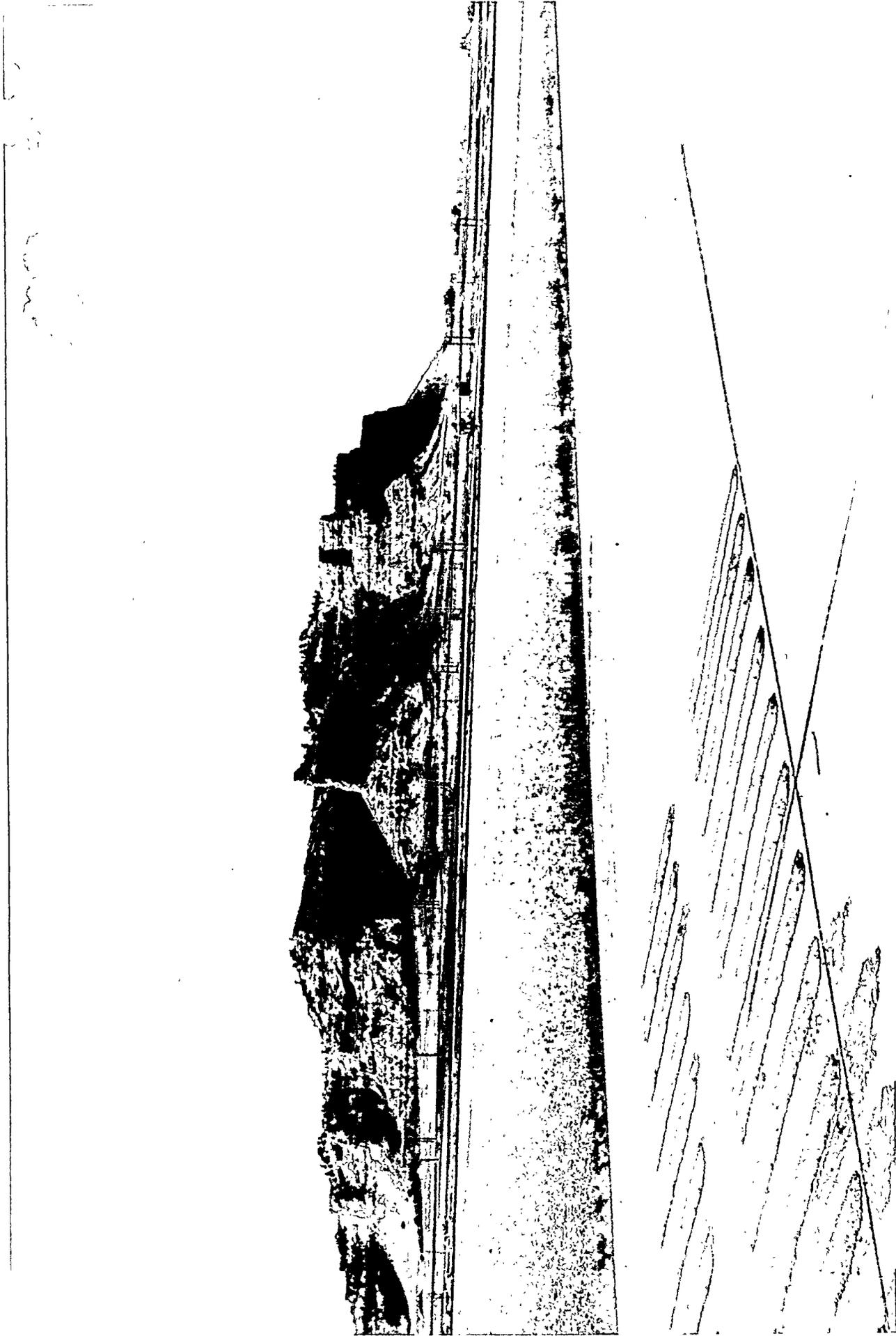


PHOTO 6 - VIEW OF EXISTING CONDITION FROM PHOTOGRAPHIC LOCATION 3

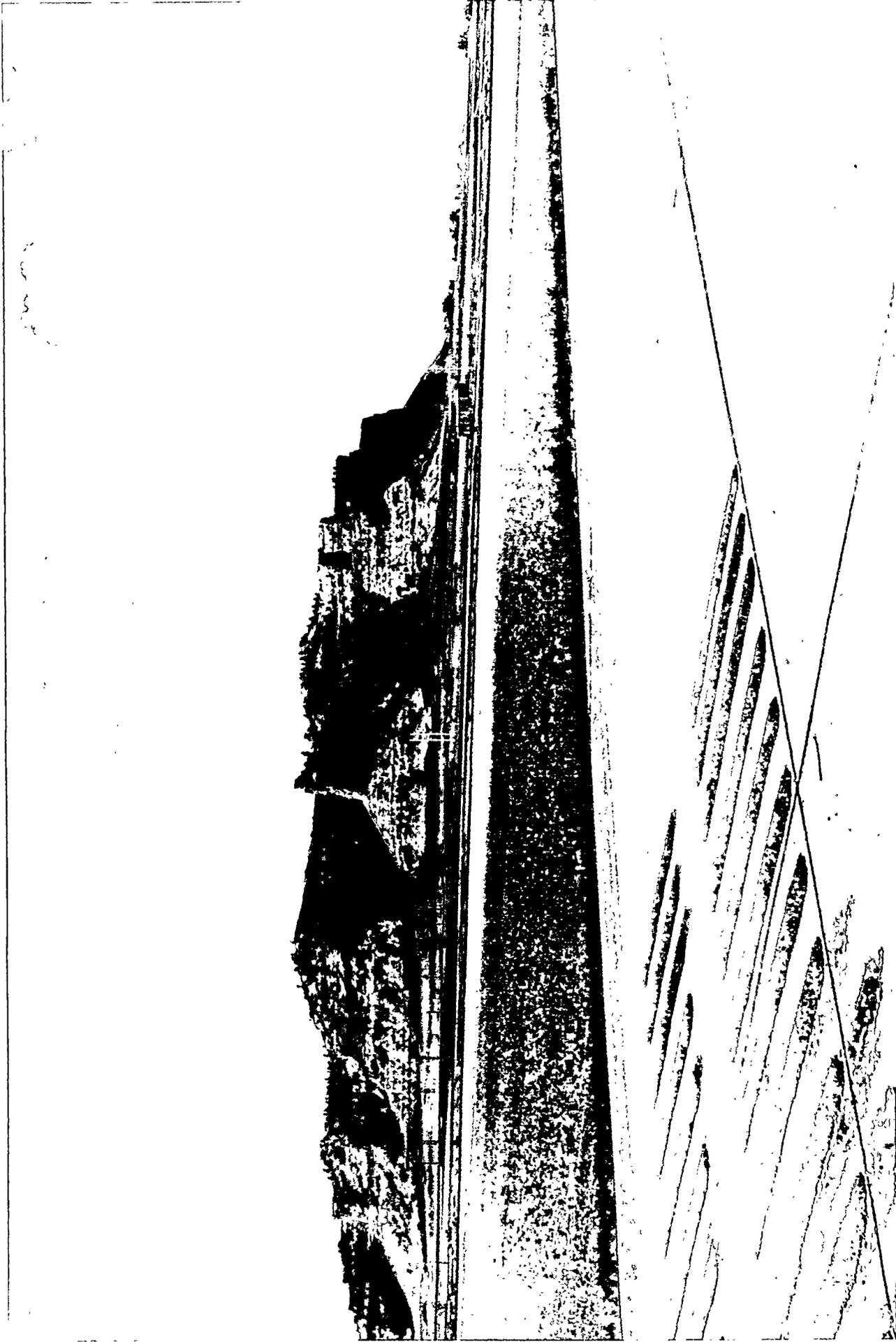


PHOTO 7 - SIMULATED VIEW OF PROPOSED ACTION WITH GALVANIZED STEEL  
STRUCTURES TAKEN FROM PHOTOGRAPHIC LOCATION 3

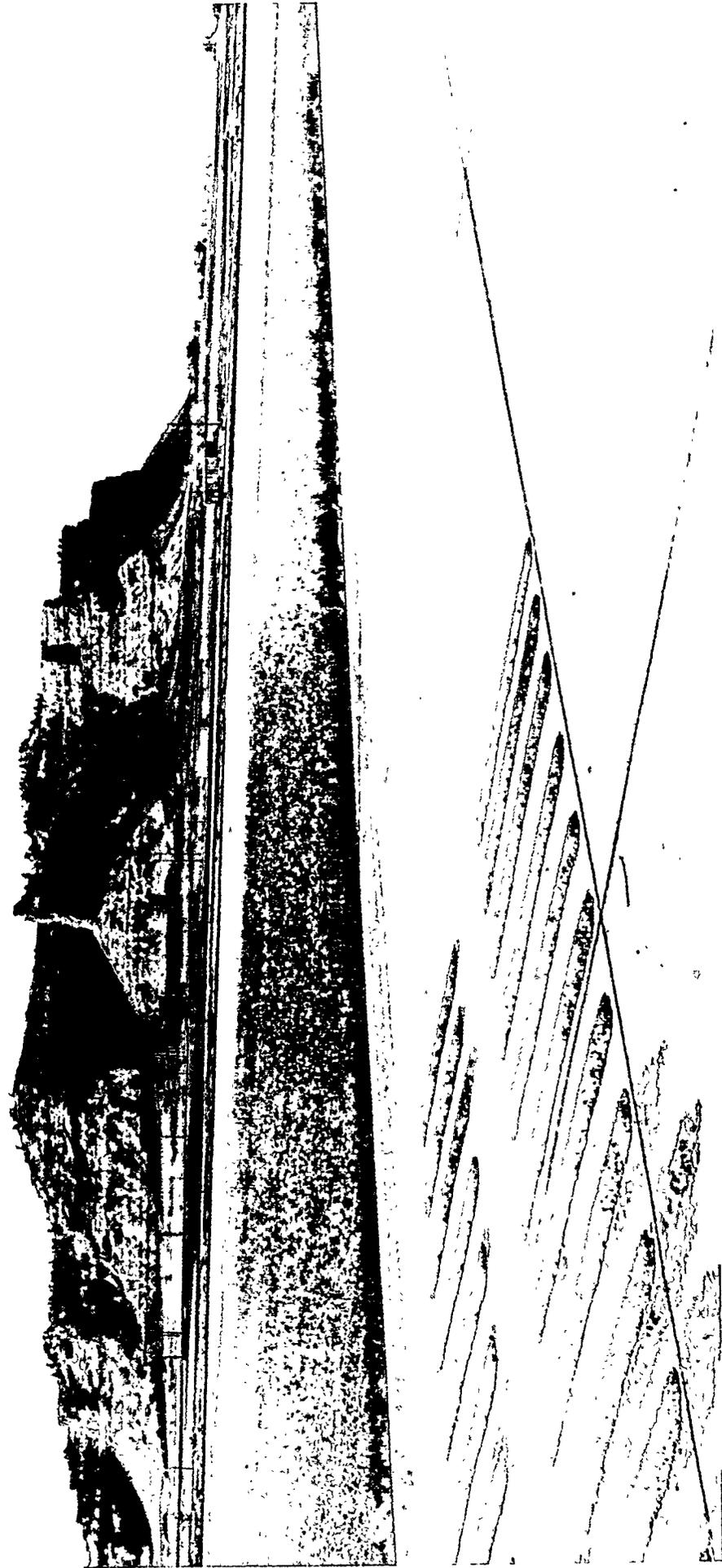


PHOTO 8 - SIMULATED VIEW OF PROPOSED ACTION WITH OXIDIZED STEEL (RUST COLOR)  
STRUCTURES TAKEN FROM PHOTOGRAPHIC LOCATION 3

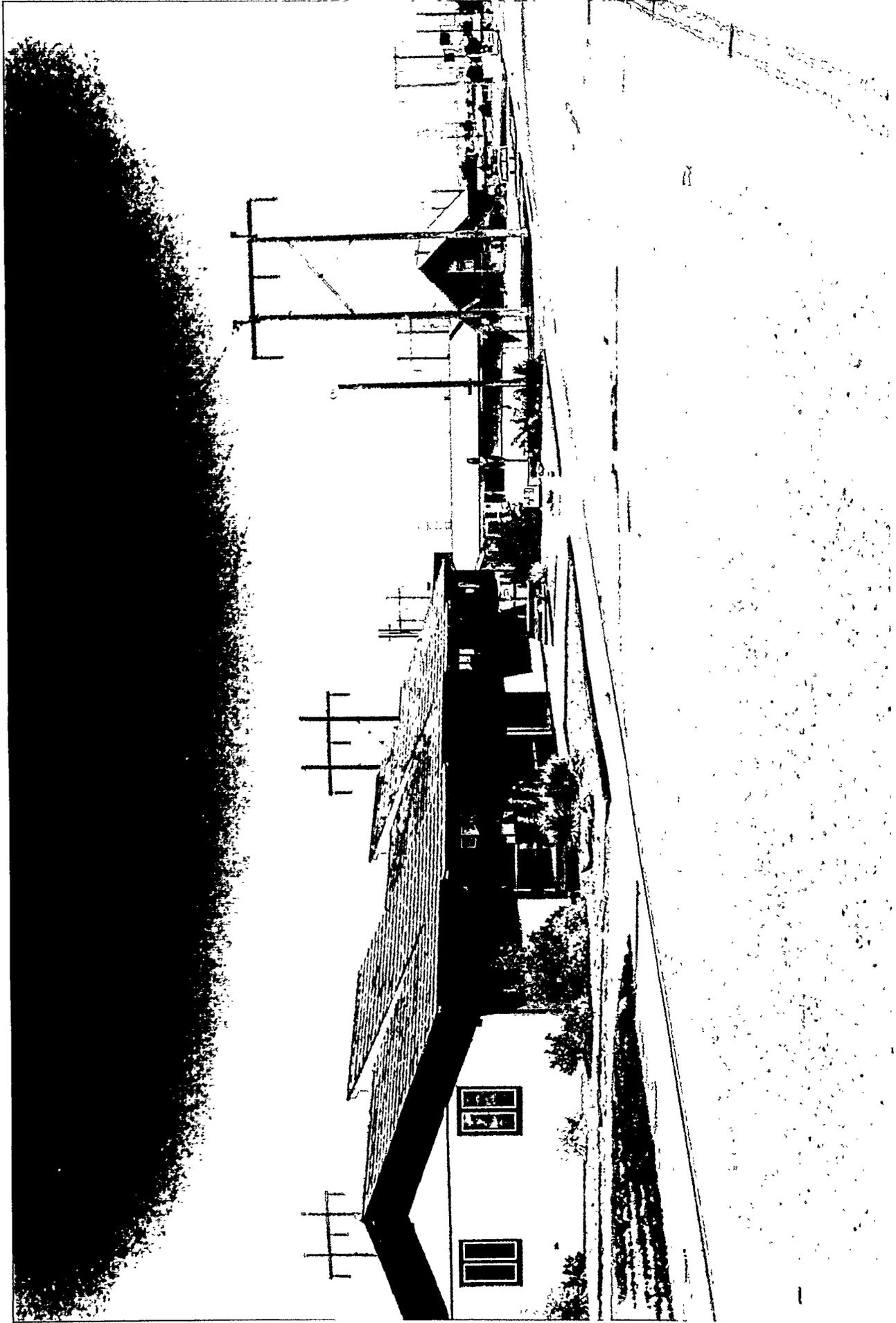


PHOTO 9 - VIEW OF EXISTING CONDITION FROM PHOTOGRAPHIC LOCATION 4

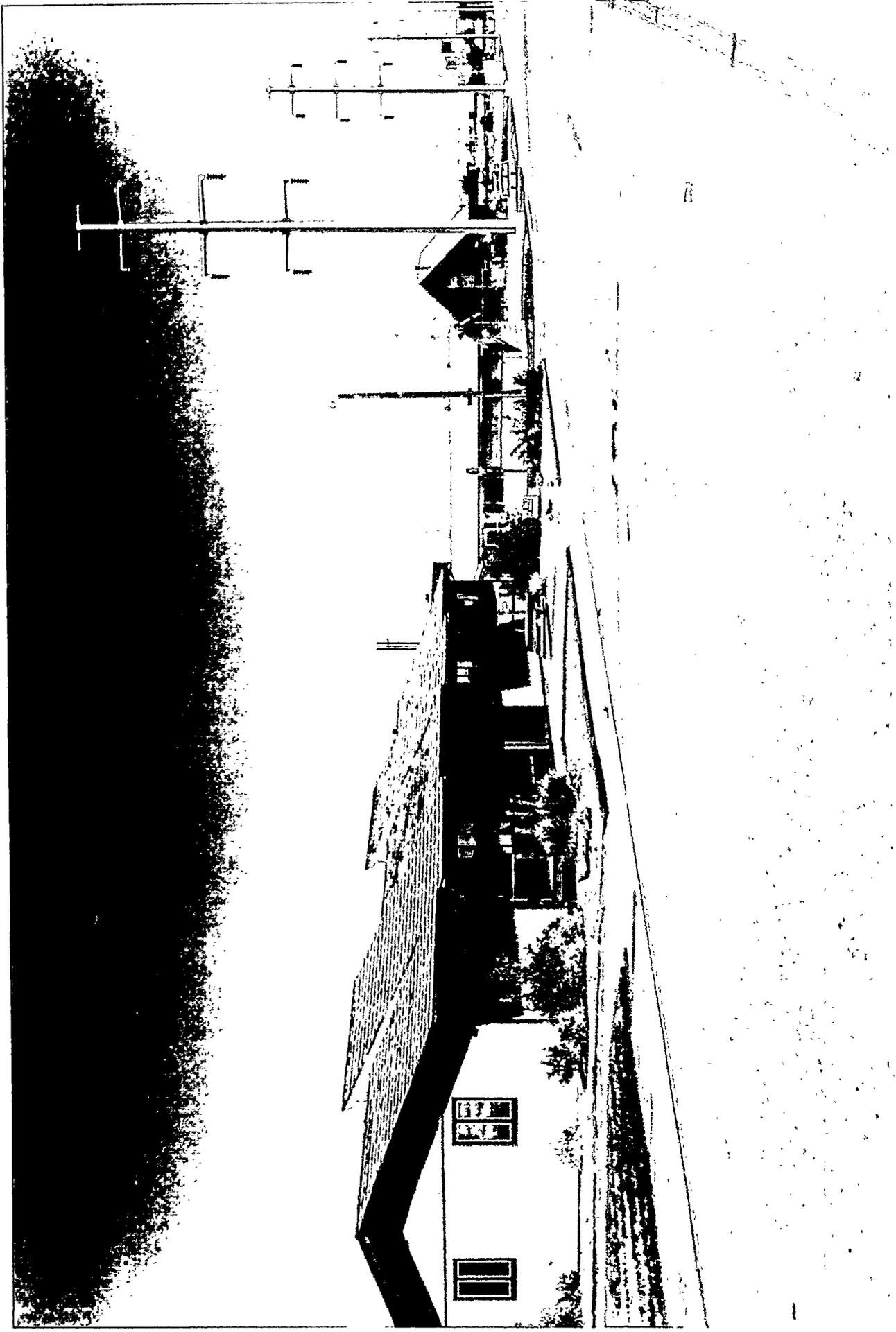


PHOTO 10 - SIMULATED VIEW OF PROPOSED ACTION WITH GALVANIZED  
STEEL STRUCTURES TAKEN FROM PHOTOGRAPHIC LOCATION 4

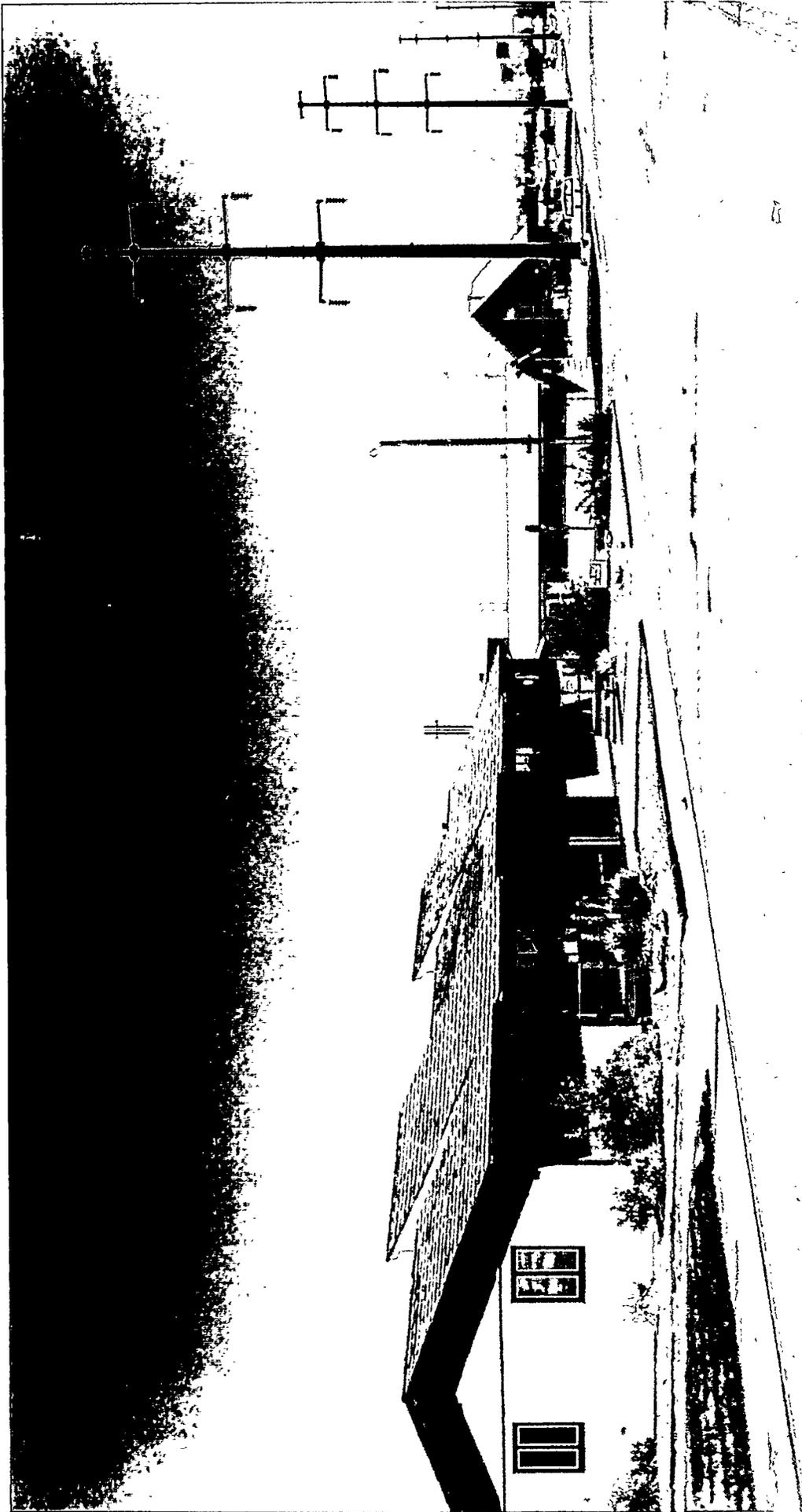


PHOTO 11 - SIMULATED VIEW OF PROPOSED ACTION WITH OXIDIZED STEEL (RUST COLOR) STRUCTURES TAKEN FROM PHOTOGRAPHIC LOCATION 4

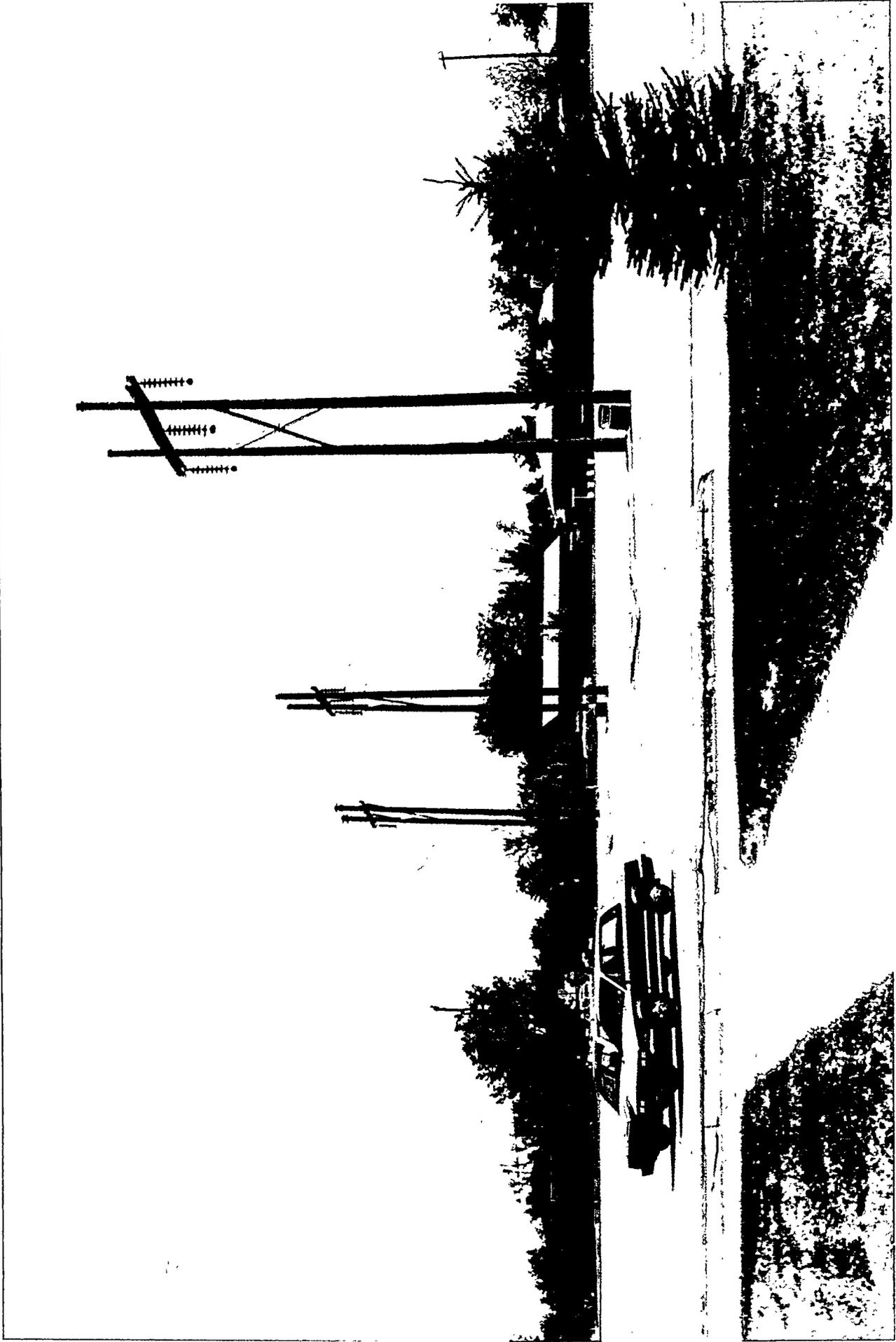


PHOTO 12 - VIEW OF EXISTING CONDITION FROM PHOTOGRAPHIC LOCATION 5

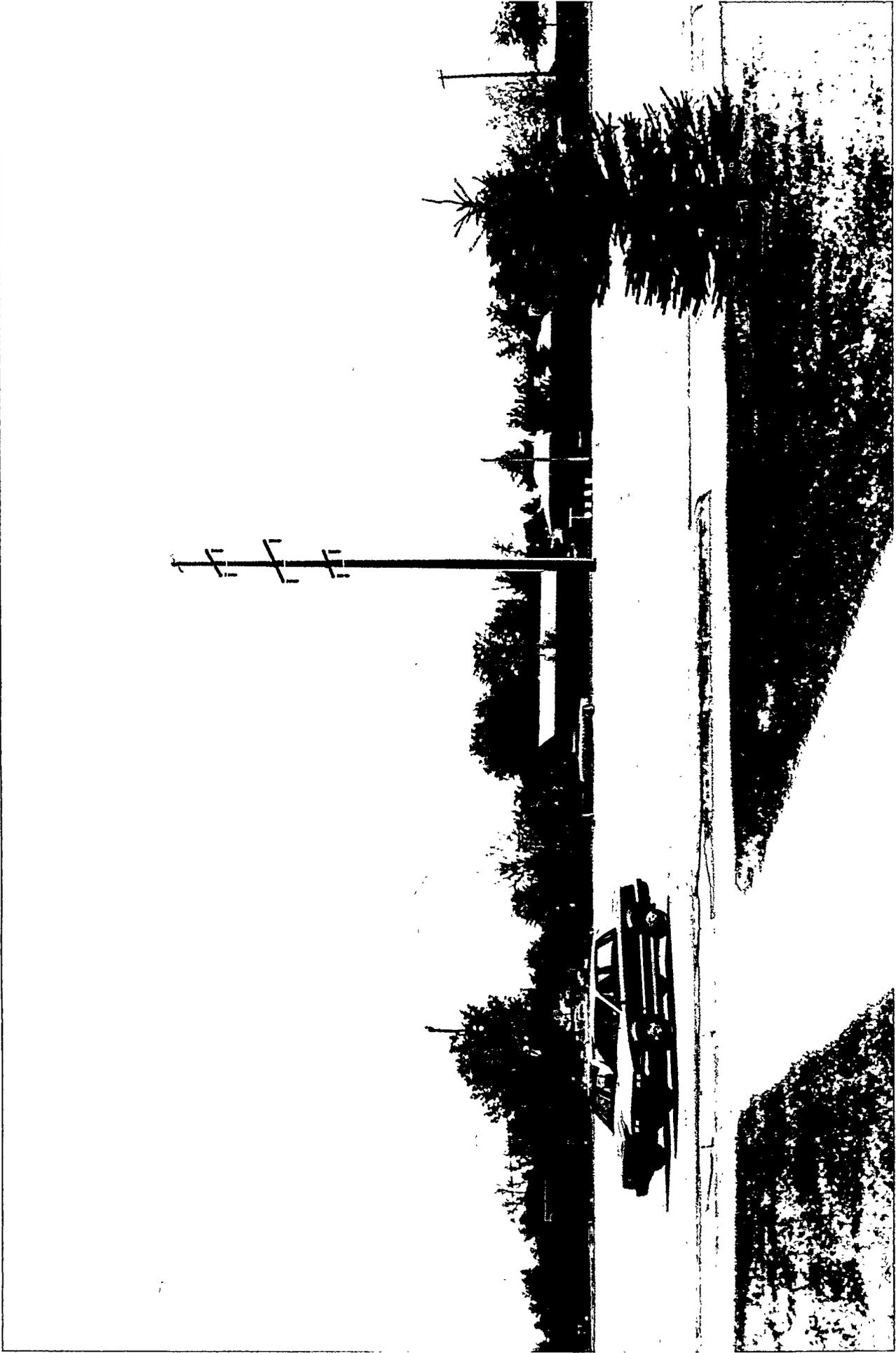


PHOTO 13 - SIMULATED VIEW OF PROPOSED ACTION FROM PHOTOGRAPHIC LOCATION 5

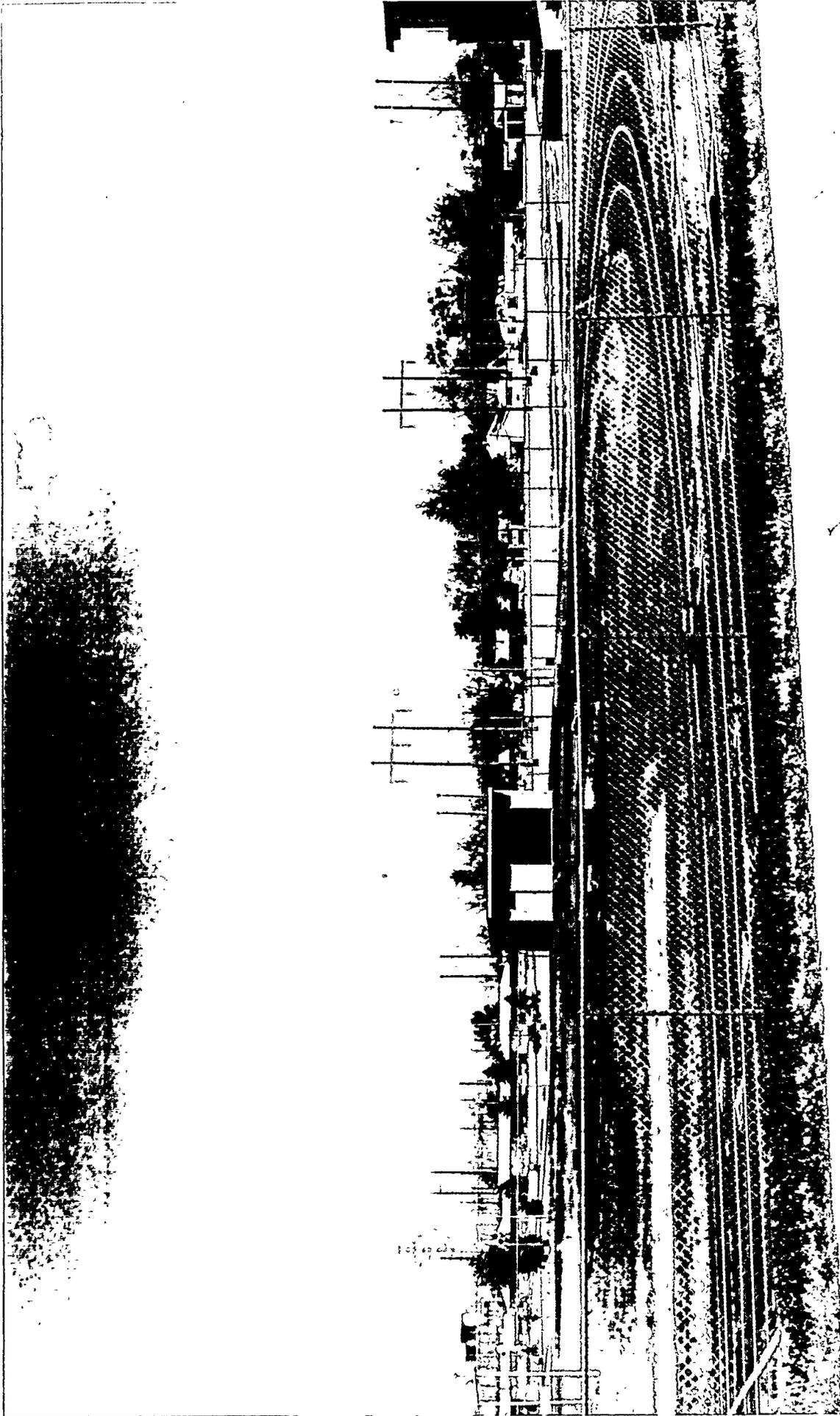


PHOTO 14 - VIEW OF EXISTING CONDITION FROM PHOTOGRAPHIC LOCATION 6

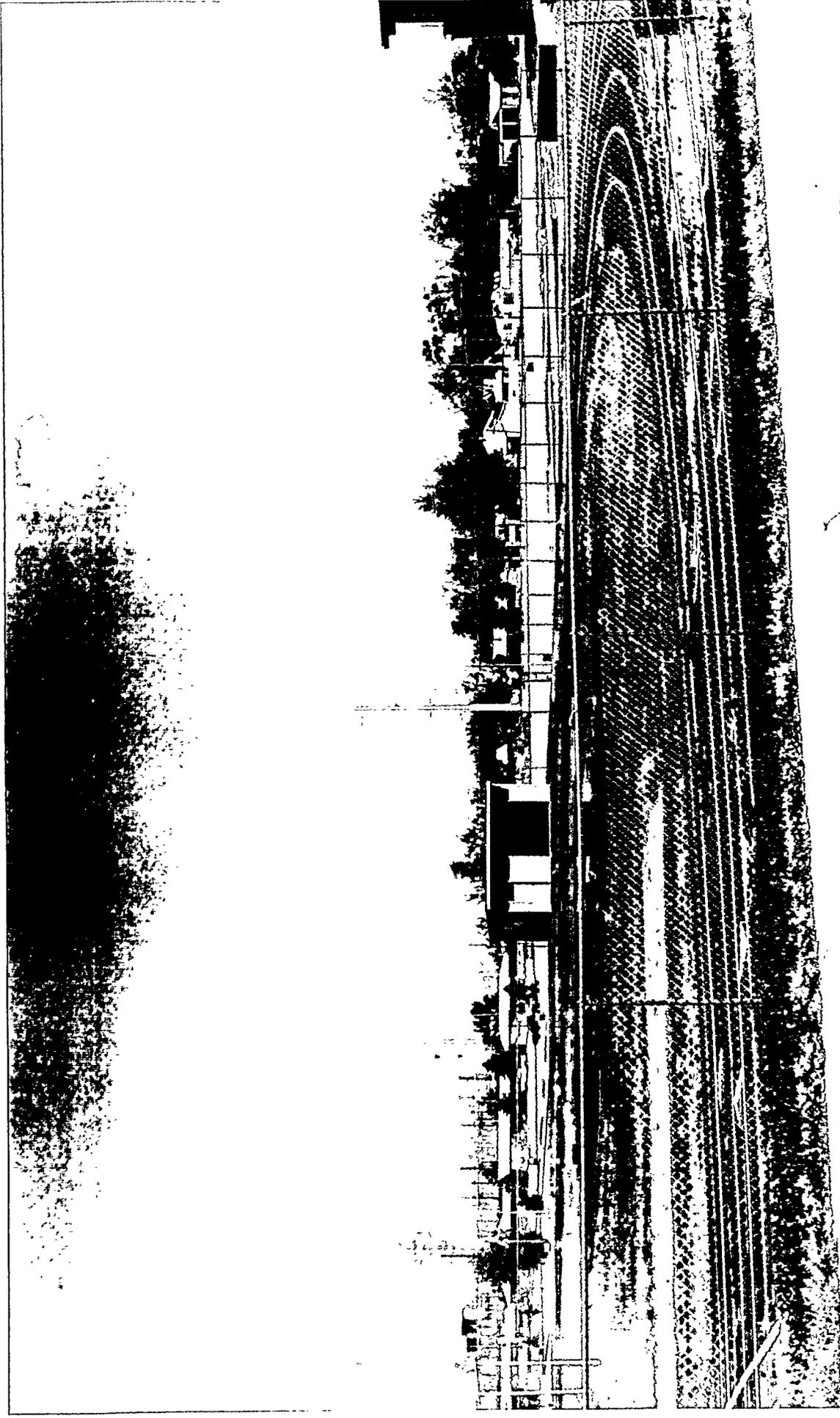


PHOTO 15 - SIMULATED VIEW OF PROPOSED ACTION FROM PHOTOGRAPHIC LOCATION 6



PHOTO 16 - VIEW OF EXISTING CONDITION FROM PHOTOGRAPHIC LOCATION 7



PHOTO 17 - SIMULATED VIEW OF PROPOSED ACTION FROM PHOTOGRAPHIC LOCATION 7

## DEPARTMENT OF ENERGY

Western Area Power Administration

Gering-Stegall 115-kV Transmission Line Consolidation Project, Scotts Bluff County, Nebraska

AGENCY: Western Area Power Administration, DOE.

ACTION: Finding of no significant impact.

SUMMARY: The Department of Energy (DOE), Western Area Power Administration (Western) proposes to consolidate segments of two transmission lines near the Gering Substation in Gering, Nebraska. The transmission lines are both located in Scotts Bluff County, Nebraska, within the city of Gering. Presently, there are three parallel 115-kilovolt (kV) transmission lines on separate rights-of-way (ROW) that terminate at the Gering Substation. The project would include dismantling the Archer-Gering wood-pole transmission line and rebuilding the remaining two lines on single-pole steel double circuit structures. The project would consolidate the Gering-Stegall North and Gering-Stegall South 115-kV transmission lines on to one ROW for a 1.33-mile segment between the Gering Substation and a point west of the Gering Landfill. All existing wood-pole H-frame structures would be removed, and the Gering-Stegall North and South ROWs abandoned. Western is responsible for the design, construction, operation, and maintenance of the line.

Western prepared an environmental assessment (EA) that analyzed the potential environmental impacts of the proposed construction, operation, and maintenance of the 115-kV transmission line consolidation. Based on the analyses in the EA, the DOE finds that the proposed action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act of 1969 (NEPA). The preparation of an environmental impact statement (EIS) is not required, and

**MASTER**

therefore, the DOE is issuing this finding of no significant impact (FONSI).

FOR FURTHER INFORMATION CONTACT:

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Area Manager  
Loveland Area Office  
Western Area Power Administration  
P.O. Box 3700  
Loveland, CO 80539  
(970) 490-7201

Additional information and copies of the EA and FONSI are available to all interested persons and the general public from the person named above. For general information on DOE NEPA activities contact:

Carol M. Borgstrom  
Director, Office of NEPA Policy and Assistance, EH-42  
U.S. Department of Energy  
1000 Independence Avenue SW.  
Washington DC 20585  
(202) 586-4600 or (800) 472-2756

SUPPLEMENTARY INFORMATION: Western proposes to consolidate segments of two transmission lines near the Gering Substation in Gering, Nebraska. The project would consolidate the Gering-Stegall North and Gering-Stegall South 115-kV transmission lines on to one ROW for a 1.33-mile segment between the Gering Substation and a point west of the Gering Landfill. All existing wood-pole H-frame structures would be removed, and the Gering-Stegall North and South ROWs abandoned.

The Gering-Stegall transmission lines, which are single circuit, wood-pole H-frame design, serve electrical load in the North Platte Valley. Western's customers in the region include the city of Gering and Roosevelt Public Power District (Roosevelt). The Gering-Stegall South line was built in 1950, and the Gering-Stegall North line was built in 1956. The Archer-Gering line was

constructed in 1939 and deenergized in 1986. In 1986 the Archer-Gering transmission line was dismantled except for a 1.33-mile segment in the city of Gering.

Western's purpose in pursuing this project is to eliminate routine access problems to the transmission lines, increase reliability of the transmission lines, and reduce overall maintenance of the lines by consolidating and modernizing the system. Within the city of Gering, all three transmission lines currently pass over houses, the Gering high school parking lot and tennis courts, a church, and a landfill. There are about 25 houses in the ROW, and about 15 others with parts of their property in the ROW. The homes and other facilities were built within the ROW after the transmission lines were constructed. Due to ROW access and encroachment problems under the transmission lines, routine and emergency maintenance on the lines has become increasingly difficult. The proposed action would consolidate two transmission lines into one ROW, and dismantle a third. The two abandoned transmission line ROWs would revert back to the underlying landowners. This consolidation would enhance access for routine and emergency maintenance by locating the double-circuit line adjacent to a public road. It would also reduce the occurrence of incompatible land uses within the transmission line ROW.

Western conducted a public meeting in Gering, Nebraska, on February 3, 1994, to present project needs and to identify environmental issues, alternative designs, and alternative routes. Several actions were considered as alternatives to the proposed action including No-Action, alternative electrical systems, alternative structure designs and alternative routes.

Under the No-Action Alternative, Western would not consolidate the existing Gering-Stegall 115-kV transmission lines, and would only perform essential maintenance activities as needed. The No-Action Alternative would not eliminate ROW encroachment problems and therefore is not considered as a reasonable alternative for this project.

As part of its marketing policies, Western encourages energy conservation through the promotion of efficient and economic uses of energy, and through the use of renewable resources such as hydro, wind, solar, and geothermal energy sources. However, the purpose and need for the Gering-Stegall consolidation project cannot be met by energy conservation.

Two basic design alternatives were evaluated; underground construction and overhead construction. Underground construction would be very difficult given the technical difficulty and expense of burying two large 115-kV transmission lines. Several design alternatives were evaluated for overhead construction, including single and double circuit designs. Because of the space constraints of the various routes and the overall goal of reducing the number of residences affected by the line, a double-circuit design was selected for overhead construction.

Several potential alternative routes were identified based on review of aerial photography and field reconnaissance, and input from the public meeting. The alternative routes included the north side of U Street, the south side of U Street, north of the high school, through developed and undeveloped Park lands, and the railroad ROW to Highway 71 alternatives. All except one of the

routes had significant problems which cause them not to be carried forward for full analysis in the EA. The north side of U Street alternative is Western's proposed route.

Analyses of the potential effects of the proposed project on the human environment revealed no significant impacts.

Although current residential, institutional, industrial, and recreational land uses in the study area are generally sensitive to the construction and operation of transmission lines, the proposed project would result in reduced impacts to these land uses over the long-term due to less intrusion on private properties by Western personnel and their equipment during maintenance activities. Maintenance activities would be less intrusive because the new transmission structures would be fewer in number and far more accessible. At present, there are 31 structures along the three existing transmission lines. Under the Proposed Action, the number of structures would be reduced to a maximum of 14. Moreover, the new transmission line structures would be located immediately adjacent to U Street, instead of on private property which generally have poor access for equipment. If the proposed action utilized 11 or 12 structures, there would be a net removal of seven structures from residential properties, two from church property, and four from the high school. These numbers might vary slightly if 13 or 14 new structures are used. The ROW for the Proposed Action would cross nine residential properties, compared to 31 under existing conditions.

Construction of the proposed project would not affect planned land uses because the new structures and transmission lines would be located to the south of these new developments. No physical intrusion of construction

workers or operation and maintenance personnel or associated equipment would be required at the locations of known planned developments.

The proposed new double circuit transmission line, like the existing Gering-Stegall transmission lines, would be constructed to National Electrical Safety Code (NESC) standards. The operation of the transmission line would not present a safety or electrical hazard to the general public. The new transmission line would be constructed at the edge of U Street, a city street. Overall, potential safety hazards from activities such as kite flying and tree trimming, or ROW encroachments, would be greatly reduced (a reduction of 3 to 1). The new project would have less opportunity for interaction with people and hazardous activity than the existing transmission lines. The existing Gering-Stegall transmission lines, which presently span over homes and backyards in a residential neighborhood, would be removed. And finally, the new transmission line would require less maintenance than the existing lines reducing shock hazard exposure for linemen and maintenance forces.

Western's standard grounding policies effectively mitigate the possibility of nuisance shocks due to induced currents from stationary objects such as fences and buildings. No special safety measures would be necessary for any of the project design alternatives.

Since this project does not involve upgrading the voltage of the lines and the current and electrical load of the circuits would remain the same, calculated field effects are very similar between existing conditions and the proposed action. Calculated corona effects such as audible noise, radio and television

interference and ozone would not change significantly. However, electric field and magnetic fields (EMF) would be less for the Proposed Action than currently present for the existing transmission lines.

The proposed routing for the new double circuit transmission line would reduce the number of residences exposed to EMF. Overall, the project would provide several benefits relative to reducing potential safety hazards and reducing EMF. However, the EMFs associated with either the existing single circuit transmission lines or for the proposed double circuit transmission line are not anticipated to adversely affect public health or public safety.

The proposed project would result in a small short-term increase in population in Gering, due to employment of contract construction workers. A temporary increase in population of 30 people would represent an increase of less than 1 percent. Construction, operation, and maintenance of the proposed project should not increase or decrease the need for police, fire, medical, or other community resources in the project area. It is unlikely that the proposed project would have a perceptible impact on the study area economy because there should be little or no reduction in local agricultural production and tourist visitation to the Scotts Bluff National Monument should not change.

The Proposed Action would require an easement width of 52 feet. Western has offered to purchase the affected homes and relocate property owners within the easement boundaries as required under the Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970. At the present time, it is unclear how many households will participate in the acquisition program and will be relocated as a result of the proposed project. Since Western would compensate and relocate any households that would be acquired as a result of

the project, housing-related impacts would be mitigated to a level of insignificance. Homeowners currently located within the proposed project easement may elect not to sell their homes to Western and could remain permanently. This project will not disproportionately impact minority and low-income populations.

Construction of the Proposed Action would not impact any significant archeological or historic sites. For compliance with the National Historic Preservation Act, specifically Section 106, Western consulted with the Nebraska State Historic Preservation Officer (SHPO) concerning the National Register eligibility of sites within the area of potential impact. On May 9, 1995, the Nebraska SHPO concurred with Western's determination that no historic properties would be affected by the project. Western also consulted with the National Park Service, Scotts Bluff National Monument, concerning impacts to potentially eligible sites.

The Proposed Action would generally have moderately positive visual impacts. Removal of the 31 H-frame structures would reduce the amount of vertical line contrasts existing in the landscape. The new single steel poles would tend to consolidate the visual contrasts, changing the view from one that has many lower intensity contrasts to one with fewer. However, the size of the new steel structures would be noticeably larger than the H-frame structures. There are a number of other transmission lines and other structures in the vicinity of the Proposed Action, and the Proposed Action would not result in substantial changes in the visual landscape of the study area.

Views from Scotts Bluff National Monument would generally encompass only a portion of the Proposed Action. From the South Overlook, all of the

structures of the Proposed Action would be hidden behind a peninsular landform extension of Scotts Bluff. The visual change would create a positive effect from removal of one H-frame, resulting in a net decrease in 2 vertical poles within the view. However, there are a number of other transmission line structures evident in the view from the South Overlook, and the visual improvement would be slightly additive.

Views from the parking lot on top of Scotts Bluff would encompass most of the project area, in a middle ground to background distance zone. However, due to the distance and the urban backdrop of the view, only the western 2 or 3 new structures would be visually evident. There would be a moderately positive impact due to removal of 10 structures from within the middle view (0.5 to 1.0 mile). However, the highly modified landscape of the view would tend to reduce the significance of any visual change: the western-most structure would be in agricultural land, and the next two structures east will be adjacent to a landfill.

The Proposed Action would be hardly visible from the Scotts Bluff National Monument Visitors Center, due to distance and foreground topographic screening. Due to a low ridge in between the project area and the Visitors Center, only the upper half of the transition structure would be visible, and all of the other new structures would be hidden from view. The partial view of the transition structure would be insignificant compared to other more visually evident vertical elements on the horizon. The result would be no noticeable beneficial or adverse effects.

Views from the trail from the parking lot on top of Scotts Bluff to the Visitors Center would be generally similar to those from the parking lot, but

from a lower angle. No portion of the Proposed Action would be visible from the North Overlook on Scotts Bluff.

Six or seven of the new structures would be located immediately adjacent to U Street within the urban portion of the city of Gering. The new larger scale structures would be wider and taller than the poles of the existing H-frame structures. However, since the proposed action involves removal of 15 structures from within the urban area and replacing them with significantly fewer but more massive structures, the overall visual impact is likely to be about the same as under existing conditions.

Coordination with the U.S. Fish and Wildlife Service revealed the potential occurrence of listed threatened or endangered species. Within the project area, these include the bald eagle and peregrine falcon. The Proposed Action should have no effect on peregrine falcons and bald eagles and no mitigation is recommended. On April 26, 1995, the FWS concurred with Western's determination that the project will not affect federally listed threatened and endangered species or their critical habitat. The Nebraska Game and Parks Commission also concurred with this determination on May 2, 1995.

The only wetlands are found in the northern part of the study area, nearly 1 mile from the proposed route. Since no wetlands occur in or adjacent to the proposed route, the Proposed Action would have no effect on wetlands and no mitigation is recommended.

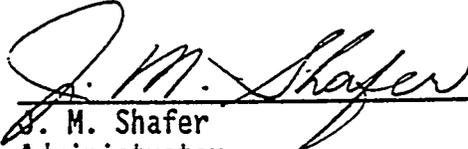
No impacts to surface water resources would occur as a result of the proposed project because the transmission lines would span both the Gering Irrigation Canal and the intermittent drainage nearby.

Since the proposed Gering-Stegall Transmission Line would not cross any designated 100-year or 500-year floodplains, there would be no flood-related impacts associated with the project.

There would be short-term, minor impacts to soils. Such impacts are addressed by Western's standard construction practices and are not significant.

DETERMINATION: The analyses contained in the EA indicate that the proposed action is not a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA. DOE has determined that preparation of an EIS is not required and is, therefore, issuing this FONSI.

Issued at Golden, Colorado, June 2, 1995.

  
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J. M. Shafer  
Administrator