

JUN 20 2002

**PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA**

**SOUTH DAKOTA PUBLIC
UTILITIES COMMISSION**

In the Matter of the Application of Basin)
Electric Power Cooperative for a Construction)
Permit for 23 miles of 230 kV Electric)
Transmission Line and Associated Facilities)

STIPULATION

EL01-025

It is hereby stipulated and agreed by and between the Applicant, Basin Electric Power Cooperative, Intervenor, Black Hills Power, Inc. ("Black Hills"), and Staff of the South Dakota Public Utilities Commission ("Staff"), that the following Findings of Fact and Conclusions of Law, and an appropriate Order consistent with said Findings and Conclusions may be adopted by the South Dakota Public Utilities Commission (the "Commission") in the above-captioned matter. In support of its Application, the Applicant and Black Hills do hereby offer this Stipulation, the Application filed October 11, 2001 and all responses submitted by the Applicant to the Staff's data requests. Staff offers no answering testimony or exhibits conditioned upon the Commission accepting the following Findings of Fact and Conclusions of Law.

FINDINGS OF FACT

1. INTRODUCTION

Applicant and Black Hills have entered a Memorandum of Understanding whereby Applicant and Black Hills will own 65% and 35% of the Rapid City DC Tie Project, respectively, which ownership interest will not include the transmission facilities owned solely by Applicant as further described hereinafter. Each entity's ownership will be an undivided interest and each entity will contribute its proportionate share of the capital necessary to construct the Project.

The proposed Rapid City DC Tie Project will be comprised of the following components:

- a. Approximately 23 miles of 230 kV transmission line (including all poles, wires, supporting structures, communications facilities relating thereto);
- b. A terminal bay at the South Rapid City Substation at the western edge of the transmission line;
- c. A two-channel, 200 megawatt DC tie Converter Station located approximately four (4) miles southeast of the South Rapid City Substation; and
- d. A terminal bay at the existing New Underwood Substation at the eastern end of the transmission line.

More than one (1) mile of the transmission line does not follow section line rights-of-way, property lines, roads, highways or railroads. The Rapid City DC Tie Project does not constitute reconstruction or modification of existing transmission lines and existing associated facilities located on abandoned railroad rights-of-way.

2. PURPOSE OF FACILITY

Construction of the proposed Rapid City DC Tie Project is required to assure an adequate electric power supply and reliability of the electric transmission system to serve rapidly expanding needs of the customers served by Applicant's cooperative members in South Dakota and northeastern Wyoming and to enable Black Hills to serve its customers located in the same area.

The Rapid City DC Tie Project will be interconnected with Applicant's and Black Hills' "Common Use Transmission System" a jointly owned and integrated system, which serves cooperative

members and Black Hills' customers in western South Dakota and northeastern Wyoming. In addition to the growing needs of cooperative members, Black Hills also anticipates growth in its regional electric load. The Rapid City DC Tie Project enhances the ability of the transmission system to serve all of these customers. The Project is an anticipated, studied and planned system addition which enhances the ability of the Common Use Transmission System to serve both the Applicant's and Black Hills' retail service area load.

Applicant's electric generation resources connected to the western electric grid are not sufficient to meet this growing demand, and its existing transmission system is not capable of transporting sufficient energy from its generation resources connected to the eastern electric grid to satisfy demand. The Converter Station, transmission line and the associated facilities which, together will comprise the Rapid City DC Tie Project, will provide a link between the eastern and western power grids in the United States. The alternating current (AC) power systems of the eastern grid and the western grid were developed separately and electric power cannot flow back and forth between them without a special connection (i.e. the converter tie). The Converter Station will act as a giant "shock absorber" by converting the AC power from one grid to direct current (DC) power, then reconverting the power back to AC on the other grid. This process prevents disturbances in one grid from causing disturbances on the other grid and thus facilitates reliable transfer of electric energy across the east-west grid separation.

3. DESCRIPTION OF PROJECT

The Rapid City DC Tie Project facilities will be comprised of three (3) primary components, viz. (A) the Converter Station; (B) approximately 23 miles of 230 kV transmission lines and associated facilities; and (C) terminal bay facilities at the existing South Rapid City Substation and the New Underwood Substation. Those components are described in more detail as follows:

a. **The Converter Station.** The Converter Station will be designed and constructed by ABB

Inc., an engineering and construction firm. The Converter will have two (2) bi-directional

channels (100 megawatts capacity each). The Converter will employ High Voltage Direct

Current (HVDC) technology, which is a well-proven technology employed for electric

power transmission worldwide. ABB has supplied over one-half of all the HVDC converter

projects in the world. The Converter Station equipment will be located within a 40-acre

tract of land in Pennington County, near Rapid City, and will consist of outdoor and indoor

electrical equipment. Outdoor equipment will include concrete foundations, steel

structures, electrical insulators and equipment such as power transformers, disconnect

switches, power circuit breakers, capacitor banks, cooling fans, metal enclosures for the

converter equipment and a control building. A "general arrangement" drawing of the

Converter Station layout is attached hereto as "Exhibit 1".

b. **The Transmission Line.** The proposed 230 kV transmission line will be comprised of two

(2) segments. One segment, approximately four (4) miles in length, will begin at the

existing South Rapid City Substation (owned by Black Hills). The South Rapid City

Substation will constitute the point of delivery to and the point of receipt of electric power

from the western electric grid. It will run east and south, terminating at the west side of the

Converter station. The route for the proposed 230 kV transmission line would begin at the

South Rapid City Substation and extend directly east adjacent to a section line for 2.25

miles. The proposed line will then intersect an existing 69 kV transmission line that has a

north-south orientation and is owned by Black Hills Electric Cooperative ("BHEC"). The

proposed line will then turn south at the intersection for approximately one (1) mile and will

be "double-circuited" with the 69 kV transmission line to the next section line, a point near

South Dakota State Highway 79. The proposed line, along with the existing 69 kV

transmission line, will then turn east (continuing the double circuit) and extend adjacent to the north side of the section line for more than 0.75 miles where it will enter the proposed Converter Station.

The second segment of the proposed 230 kV transmission line is the only portion of the Project that will not be owned by Applicant and Black Hills as set forth above. Applicant will be the sole owner of this segment, which will exit the east side of the proposed Converter Station just north of the section line, cross to the south side and parallel the section line (although not located in the public section line right-of-way) for about 6.5 miles to a point just south of South Dakota Highway 44. The proposed line will double-circuit with the existing 69 kV transmission line for about 1.5 miles of this 6.5-mile segment (i.e., the existing 69 kV line will be removed from its present location and attached to the new 230 kV transmission line). Within the 6.5-mile segment, the line will cross Dry Creek (two crossings), a Dakota, Minnesota & Eastern Railroad ("DM&E") line, Cyclone Ditch, South Side Ditch, and Rapid Creek. From the point just east of Rapid Creek and south of South Dakota Highway 44, the line will turn approximately 45 degrees northeast and extend 2.5 miles, crossing Lone Tree Ditch and Murphy Ditch. The line will then turn approximately 20 degrees east-northeast and extend approximately four (4) miles to a point along a section line. The line will then extend directly east along the south side of the section line (but will be located outside the public right-of-way) for approximately five (5) miles to a point just east of a north-south section line. The final portion of the line will extend approximately 0.3 miles northeastward and enter the existing New Underwood Substation.

The transmission line will consist of single-pole and two-pole structures for the western portion of the route (until it reaches the angle point near South Dakota Highway 44). Two-pole H-frame and three-pole structures comprise the balance of the route. The single-pole

structures will also support a 69 kV circuit owned by one or more members of Rushmore Electric Power Cooperative, a Class A member of Basin Electric. Portions of an existing 69 kV line in the section line right-of-way will be removed and replaced by the new double-circuit line.

- c. **Terminal Bay Facilities.** The terminal bay facilities will be comprised of breakers and other equipment designed and installed at the existing New Underwood Substation and the South Rapid City Substation to interconnect the Rapid City DC Tie Project facilities with the eastern and western electric grids at those points. The breakers and other terminal bay equipment installed at the South Rapid City Substation will be owned 65% by Applicant and 35% by Black Hills.

4. DEVIATIONS FROM DESCRIBED CENTERLINE

The specific location of the centerline of the transmission lines is set forth in Exhibit 2 to this Stipulation. It might be necessary to deviate slightly from the described centerline to accommodate engineering and applicable safety and construction requirements based upon actual conditions encountered during construction. Deviations will not infringe on the property or property rights of adjacent landowners.

5. ESTIMATED COST OF PROJECT

The estimated total cost of this facility is \$70 million, with the cost of separate project components estimated as follows:

Converter station	\$49.0 million
230 kV transmission line (23 miles)	\$9.1 million

Terminal facility at New Underwood Substation	\$0.8 million
Terminal facility at South Rapid City Substation	\$0.8 million
Engineering, overhead, interest during construction, contingency	\$10.3 million

6. DEMAND FOR THE FACILITIES

The estimated increase in consumer demand for energy in the near term in the portions of South Dakota and Wyoming that will be served by and through the Rapid City DC Tie Project is 300 megawatts ("MW"), of which 150 MW will be directly served by the proposed facility. That increased future demand was forecasted using econometric modeling techniques, with values for variables provided by several governmental and private sources. The load forecast was documented in the 1998 Power Requirements Study ("PRS"), which has since been updated several times, most recently in July 2001. The PRS is a study project conducted periodically by Basin Electric and its member cooperatives to estimate future demand for electric energy in the service areas served by Basin Electric and its members. PRS revisions are reviewed and approved by the affected membership, by the Basin Electric Board of Directors, and by the Rural Utilities Service of the U.S. Department of Agriculture. The Rapid City DC Tie Project will provide the reliability and transport capability to the western distribution system that serves western South Dakota and northeastern Wyoming that will be required to supply the electric energy necessary to meet the forecasted increases in consumer demand. If the proposed facility is not constructed by 2003, the consequences will be a violation of electrical transmission system operating criteria due to poor system performance.

In addition, since the early 1980s Black Hills has anticipated the Rapid City DC Tie Project as a required addition to the Common Use Transmission System. The 1986 Common Use Agreement between Black Hills, Applicant, and the other area cooperatives specifically addresses the Rapid City DC Tie Project as a solution for enhancing the area transmission

system's ability to serve overall system load. It provides important benefits for Black Hills' customers. First, it makes required improvements in the transmission system's ability to serve current load and future load growth, particularly, in the Rapid City, South Dakota area. Second, the Rapid City DC Tie Project will enable Black Hills to access two power markets when it must purchase power. In the recent past, the prices for power on the eastern and western transmission grids have been vastly different. Providing the parties the option of purchasing power at more favorable rates, on either side of the grid divide, improves the overall costs of service into the future. The Project facilities will provide Black Hills with important, cost-effective facilities and options for providing reliable electric service to its own customers in future years.

7. SITE DESCRIPTION

The Rapid City DC Tie Project is sited predominantly in crop and rangeland that are compatible with the proposed Project. The 23 miles of transmission line will require 295.7 acres of new right-of-way (ROW) and 40 acres for the new Converter Station. The transmission line will cross 34 parcels of land, which are owned by 20 separate landowners. The location and general arrangement of the Converter Station is shown on Exhibit 1. The centerline of the proposed transmission line is shown on Exhibit 2 attached hereto.

8. ALTERNATIVE SITES

Applicant conducted a systematic evaluation of alternative routing and location for the Rapid City DC Tie Project to select the most feasible locations, based upon such considerations as cost, cooperation of landowners, topographic features, environmental concerns and regulations, and engineering. Thirteen evaluation criteria were developed for the Rapid City DC Tie Project for the comparative screening of alternatives. A detailed discussion of the alternative evaluation is presented in Section 2.8 of the Applicant's Permit Application and Section 3.0 of the Environmental Report attached as Exhibit C thereto. The evaluation of alternatives, coupled with efforts to accommodate specific landowner requests, establishes that the centerline

proposed for the transmission line and the location selected for the Converter Station, both as described in Exhibits 1 and 2 hereto, best address the needs of the Applicant, its cooperative members, Black Hills and its customers, while minimizing impacts to the environment, existing land uses, concerns of landowners and legal and regulatory requirements.

9. ENVIRONMENTAL FACTORS AND PHYSICAL ENVIRONMENT

Applicant has completed an Environmental Report for the Rapid City DC Tie Project that is located in Appendix C of its Permit Application. The existing environment is described in detail in Section 4.0 of the Environmental Report. Estimates of the changes and impacts to the existing environment from activities associated with ROW clearing and construction and maintenance of the proposed transmission facilities are discussed in detail in Section 5.0 of the Environmental Report.

The proposed alignment for the transmission line would minimize changes and impacts to the existing environment by following existing property boundaries, road and utility ROWs where possible, siting in areas with compatible land use and minimizing the need to cross environmentally sensitive or significant features. The Environmental Report demonstrates that the proposed project will have an insignificant impact on all factors evaluated. It is not anticipated that this project will create any significant direct, cumulative or synergistic hazards to the health and welfare of human, plant or animal communities.

a. **Regional Land Forms.** The proposed project makes use of existing hilltops and ridges for construction of poles and towers and a flat area for the Converter Station. No significant grading or earthmoving will be required for construction of the transmission lines, but will be required in construction of the Converter Station. As a result, no direct, indirect or

cumulative impacts to regional landforms are anticipated by the project

- b. **Topography.** Regional topography is generally characterized by rolling hills and plains dissected by streams. The western portion of the proposed transmission facility area is hilly, with elevations ranging from 3,200 feet (975 meters) above msl near Dry Creek to more than 3,700 feet (1,128 meters) above msl in the westernmost portion of the proposed corridor. This western portion includes the floodplain of Rapid Creek which is wide and flat. Rapid Creek drains into the Cheyenne River several miles southeast of the project area.

East of Rapid Creek, the corridor for the proposed project extends diagonally to the northeast. Much of the area along this portion of the alignment is relatively flat, cultivated cropland or rangeland that becomes hillier to the north. Elevations increase from approximately 2,900 feet (884 meters) above msl at Rapid Creek to approximately 3,500 feet (1,067 meters) above msl near the northeastern terminus of the diagonal. This area is characterized by numerous steep ephemeral drainages that transport storm water from areas north of the proposed project toward Rapid Creek.

The proposed transmission line turns directly east adjacent to a section line at the northeastern terminus of the diagonal. The last portion of the diagonal and the beginning of the east-trending portion of the corridor for the proposed project descends a steep slope that eventually reaches the Box Elder Creek drainage basin. The area features numerous steep ephemeral drainages that transport storm water from the proposed corridor in a northerly direction toward Box Elder Creek and numerous diked surface water impoundments for watering stock.

c. **Geologic Features.** The Rapid City DC Tie Project is located on the eastern flank of the geologic feature known as the Black Hills Uplift. The Black Hills Uplift exposes older erosion-resistant rocks in its center and younger, weaker rocks along the periphery. The project area is located in the peripheral zone of the Black Hills Uplift.

The structural geology of the study area is not complex. The sedimentary formations dip gradually away from the Black Hills Uplift at approximately three to five degrees (Cattermole 1972). Some small amplitude folds occur in the area. No faults have been mapped in the study area.

Engineering geologic problems in the study area are primarily land sliding, mudflows and expansive soils. The project area geologic features are discussed in more detail in Section 4.8 of the Environmental Report located in Appendix C of the Applicant's Permit Application.

d. **Economic Deposits.** No economic mineral deposits are identified in the project area.

e. **Soil Type.** Soils in the area east of the Converter Station site are formed primarily from the in-place weathering of sedimentary rocks and are classified as entisols, alfisols, mollisols and aridisols.

Soils in the area west of the proposed Converter Station site are of the Canyon-Rockoa-Rock Outcrop Series. Other soil units in the proposed transmission facility west of Rapid Creek include the Nunn-Satana Association, the Samsil-Pierre Association and the Minnequa-Manvel-Penrose Association. Soils in the eastern portion of the study area, in the vicinity of Box Elder Creek, are predominantly of the Samsil-Pierre and Pierre-Kyle

Associations.

- f. **Potential for Erosion and Sedimentation.** Impacts to soils from the proposed project would be insignificant. As many as 150 acres of soil could be disturbed during construction of tower sites, the Converter Station and the access road for the Converter Station. Direct impacts to geologic resources and soils within the proposed corridor could include localized increases in potential for erosion from wind, water runoff, compaction and rutting.

No significant impacts related to the increase in potential for erosion are therefore expected as a result of construction of the transmission line. Areas that are disturbed by construction equipment will be reclaimed by planting with native vegetation after the construction equipment is permanently moved.

- g. **Seismic Risks, Subsidence Potential and Slope Instability.** Seismic hazards in the study area are rated as very low. Based on the 1996 United States Geological Survey Shaking Hazard Maps, all of Pennington County, excluding the extreme southwestern corner, shows a 1 in 10 chance that a force of 0 to 2 percent of gravity would be experienced in a 50-year period (USGS 1996).

No potentially hazardous geologic areas, such as slumps or landslides, would be affected by construction of the Converter Station or associated power poles and towers. As a result, no direct, indirect or cumulative impacts to geologic resources are anticipated by the project.

The proposed transmission facilities will be designed and constructed in accordance with all applicable codes and will incorporate state-of-the-art standards to address potential structural difficulties associated with seismic, subsidence or slope instability. In general,

soils in the project area are expected to provide adequate foundation for transmission line structures without concern of subsidence and the Converter Station is located in a flat area where slope instability will not be an issue.

- h. **Geological Constraints.** There do not appear to be any geological characteristics that present unusual constraints to the design, construction or operation of the proposed facilities.
- i. **Hydrology.** Exhibit 7 to the Application shows surface water drainage patterns and the floodplains associated with each drainage. The primary surface water bodies in the project area are Rapid Creek and Dry Creek. Box Elder Creek is located two (2) miles north of the eastern half of the proposed transmission facility. No other major rivers, lakes, streams or reservoirs are located within several miles of the study area. Dry Creek flows discontinuously during much of the year.

Other surface water in the project area occurs mainly as irrigation canals, isolated backwater areas and oxbows associated with Rapid Creek, and diked or impounded ponds in pastureland used for pasture irrigation and stock watering. Numerous ephemeral streams and drainages pass through the project area as well. Irrigation ditches located in the project area include Cyclone Ditch, South Side Ditch, an abandoned canal ditch and Lone Tree Ditch.

Impacts to surface water from the proposed project would be insignificant. All water bodies and associated buffer zones that would be crossed by the transmission alignment are less than 100 feet wide. As a result, the maximum constructed pole interval of 750 feet anticipated for the proposed transmission line will enable all water bodies and buffer zones

along the alignment of the transmission line to be physically spanned.

Direct, temporary impacts to the quality of water in Rapid Creek, Dry Creek and other small water bodies that would be spanned by the transmission line are anticipated to be minor.

These impacts could result from construction near streams that could disturb adjacent vegetation, increasing the potential for erosion. Such potential impacts will be mitigated by conducting construction activities in accordance with a plan for control of sediment and erosion. After construction, no direct, indirect or cumulative impacts to surface water quality resulting from the proposed transmission line facilities are anticipated.

- j. **Effect on Current Planned Water Uses.** The proposed transmission facilities would not use either municipal or private water and therefore would have no impacts on planned water uses by communities, agriculture, recreation, fish or wildlife.
- k. **Surface and Groundwater Use by Proposed Facility.** The proposed transmission facilities would not require consumptive use of or discharge to any surface water body or groundwater.
- l. **Aquifer Use by Proposed Facility.** The proposed transmission facilities would not require the use of groundwater as a source of potable water supply or process water.
- m. **Water Storage, Reprocessing and Cooling by Proposed Facility.** No water storage or reprocessing will be required for the construction or operation of the proposed transmission facilities. [There will be included in the Converter Station equipment a self-contained closed-loop cooling system.]

- n. **Deep Well Injection Use by Proposed Facility.** No deep well injection would be required for the construction or operation of the proposed transmission facilities
- o. **Effect on Terrestrial Ecosystems.** Detailed information resulting from biological field surveys conducted to identify and quantify the terrestrial fauna and flora potentially affected by the proposed transmission facilities are contained in Sections 4.5 through 4.7 of the Environmental Report located in Appendix C of the Permit Application. It is anticipated that construction and operation of the proposed facility will have little, if any, significant adverse impact on the terrestrial biotic environment.
- p. **Effect on Terrestrial Fauna.** The proposed project construction is not expected to significantly disrupt wildlife in the area. The area in and around the proposed transmission facility is dominated by rangeland, pasture and cropland habitats. Wildlife in these habitats is made up of species adapted to urban, grassland and riparian areas such as deer, antelope, prairie dogs, grouse, ducks, geese, hawks, eagles and songbirds. Domesticated animals raised in the region include cattle, sheep and hogs.

During the field reconnaissance, approximately six (6) potential bald eagle roost or feeding trees were identified that may be in the path of the transmission line. Upon a more detailed examination, no bald eagle roosts or nests could be verified at these sites. In addition, the field reconnaissance identified several additional potential bald eagle roost or feeding trees along Dry Creek and Rapid Creek. At this time, there is no evidence that the six (6) trees that may be in the path of the proposed transmission line have been used as roosts or feeding trees for bald eagles. If roosting or nesting bald eagles are encountered during construction, Applicant will cease construction activities in the vicinity of the roosting or nesting trees and work with the U.S. Fish and Wildlife Service ("USFWS") to develop a

mitigation plan that is appropriate and acceptable.

The addition of the power lines could have long-term impacts by increasing the mortality of birds, raptors and waterfowl. Collisions are a concern for birds and waterfowl, especially in riparian areas. Additionally, most raptors are intolerant of human activity during the breeding season, and a decline in raptor nesting within the project area may occur during the project. Raptor electrocution is also a concern with electrical poles and wires.

Construction of the Converter Station could result in the permanent loss of prairie dog habitat. Up to fifty (50) acres of black-tailed prairie dog town will be permanently removed for construction of the Converter Station and access roads. Other species may be indirectly affected. Prairie dogs are an important source of food for many predators, and a variety of species use their burrows for habitat. In addition, the new power poles would create new perches in the area where few trees exist, creating new hunting opportunities for raptors including eagles. The USFWS has noted that the black-tailed prairie dog is a species of concern, but the agency has not listed the black-tailed prairie dog as threatened.

Vegetation and trees that are removed during construction will be replanted nearby to limit displacement of wildlife. Grasses will be reseeded and shrubs will be replaced with container-grown plants.

- q. **Effect on Terrestrial Flora.** Impacts to vegetation in the project area are anticipated to be minor. Short-term impacts (that affect vegetation for one (1) year or less) could include disturbance, removal and soil compaction caused by: (a) conducting ground control surveys; (b) performing geotechnical investigations; (c) preparing equipment yards and construction trailer sites; and (d) clearing, grubbing, grading and drilling hole foundations for

installation of transmission poles.

Long-term impacts could be caused by installation of power poles, access roads, and the Converter Station, as well as ongoing maintenance along the route of the power line.

Removal of the vegetation could increase erosion and temporarily reduce the diversity in plant species. Shrubs and trees are slower to establish; therefore, a diverse vegetative cover would be re-established within a decade.

Construction associated with the project may have minor indirect effects on vegetation in the project area by increasing the potential for establishment of noxious weeds. Disturbed soil creates a hospitable environment for invasion of weeds and project-related traffic may provide a transport mechanism for seeds of noxious weeds to the area. Removal of vegetation may increase erosion and sedimentation. Increased runoff on bare and compacted soils could create gullies and change the overall landscape.

Cumulative impacts to vegetation are anticipated to be minor and include the effects from farming and ranching. The primary land use in the project area consists of ranching and farming. These practices have been changing the landscape for many years. Future agricultural use of the area may continue to change the landscape. This and future projects should have an insignificant impact on vegetation, as most areas have been altered from their natural state.

Construction would be sequenced to limit disruption to any area at one time to reduce the impact of construction on vegetation. After construction is complete, any compacted soil would be tilled and the area would be reseeded with native grasses and forbs. Because of their slower growth and establishment, shrubs would be replaced with container-grown

plants to decrease time for establishment. Trees removed during construction would be relocated or replaced with replacement trees, approximately three (3) feet tall located nearby in areas such that they will not interfere with the transmission lines and associated facilities.

- r. **Effect on Aquatic Ecosystems.** With the primary exception of aquatic ecosystems associated with the channels of Rapid Creek, Box Elder Creek and Dry Creek, the majority of wetlands in the region are emergent and are associated with irrigation diversions and stock ponds. The acreage of wetlands within 0.5 miles of the centerline of the proposed project is approximately 20 acres. Of these 20 acres, approximately 18 acres are estimated to be palustrine emergent wetlands associated with impounded water. Most of the remaining two (2) acres of wetlands within the project corridor are riverine wetlands along Rapid Creek.

The proposed project is expected to have a minimal effect on wetlands. All wetlands and associated buffer areas crossed by or near the proposed transmission line corridor are narrow (less than 130-foot wide within the corridor) and are located in low areas between hills or draws. Poles for the proposed project will be spaced at approximately 750-foot intervals and will be located on hilltops, along ridges and away from low areas insofar as possible.

- s. **Water Quality.** Construction of the proposed transmission line would comply with all applicable federal, state and local permits required for alteration of wetlands, streams or rivers resulting from the project. The following are specific measures that would be taken to protect water quality in the proposed project corridor:

- Best management practices would be implemented to minimize erosion and sedimentation, runoff and surface instability during construction.
- Construction would be conducted to minimize disturbances around surface water bodies to the extent possible.
- A storm water permit will be obtained from the State of South Dakota.
- Current drainage patterns in areas affected by construction would be maintained to the extent possible.
- Staging areas for project-related construction equipment would be located in areas that are not environmentally sensitive to control erosion.
- Staging and laydown yards for project-related construction would be established at least 50 feet from waterways or wetlands, if permitted by topography. No vegetation would be cleared between the yard and the waterway or wetland.
- Construction equipment would not be serviced within 25 feet of waterways or wetlands. Equipment would not be fueled within 100 feet of the waterways or wetlands.
- Any spills of fuels or other hazardous materials during construction or system maintenance would be promptly contained and cleaned up.

- Any herbicides used in ROW maintenance would be approved by the U.S. Environmental Protection Agency and applied by licensed professionals. Application of herbicides would be limited to the extent necessary for regular maintenance of the transmission system.

t. **Air Quality.** Particulate emissions associated with construction of the utility line and Converter Station would be mitigated using dust-suppression techniques. Examples of measures for control of particulates are, if necessary:

- Applying water or dust palliatives, such as magnesium chloride, to disturbed areas, as necessary, to reduce dust when vehicle traffic is present.
- Covering open haul trucks with tarps both on site and off site.
- Ensuring that construction vehicles use paved roads wherever possible to access the construction ROW.
- Limiting vehicle speeds on unpaved roads and in the construction ROW to 20 miles per hour, or as required to control dust.
- Removing any soil or mud deposited by construction equipment on paved roads near the egress from unpaved areas, when necessary.

- Stabilizing disturbed areas in compliance with the revegetation plan after construction is complete.

With implementation of these mitigation measures, particulate emissions from construction would be substantially reduced. Accordingly, particulate emissions from construction of the project, as mitigated, will not be significant. No significant emissions are expected from the operation of the transmission facilities.

10. LAND USE

- a. Land Use Map.** The proposed transmission line and Converter Station would cross a diverse landscape with a mixture of land uses, including: dry land and irrigated cropland; range land; streams; irrigation canals; riparian corridors; designated 100-year floodplains; stock ponds; urban and rural residential areas; industrial land; various transportation corridors; animal feed lot corrals; grain bin storage; salvage yards; the flight path for the Rapid City Regional Airport; a highway maintenance yard; a sanitary landfill; and existing substations located on the east and west ends of the project. The proposed transmission line crosses several transportation corridors including South Dakota Highway 79, South Dakota Highway 44 and the DM&E railroad line. The proposed transmission line would traverse 99 percent private land that is zoned agricultural and is regulated by Pennington County land use plans and ordinances.
- b. Homes and Persons Displaced.** There will be no homes or persons displaced as a result of the construction, operation or maintenance of the proposed transmission facilities.

c. **Land Use Compatibility.** The proposed transmission facilities are compatible with the present land uses of the surrounding area. The majority of the proposed transmission line traverses private land that is zoned agricultural. The project area is characterized by rolling rangelands with a view of the Black Hills west of the project corridor. The addition of power lines to the area would have minimal direct or indirect impacts on the already linear features of the landscape, as existing roads, fencing and power lines transect the area. Construction would temporarily alter the area.

Development of land in the region would continue to have cumulative impacts by changing the landscape from cropland and rangeland to rural and urban developments. Recent developments such as highway development, roads, an auto salvage yard, landfill, substations and power lines add to the permanent linear change in the landscape.

d. **Effect on Land Use.** The proposed project would have a minimal impact on land use. The majority of the proposed transmission line traverses private land that is zoned agricultural and is regulated by Pennington County land use plans and ordinances. The remaining land consists of both nonagricultural private and public lands such as the highway maintenance yard, a sanitary landfill, South Dakota Highway 79, South Dakota Highway 44 and the DM&E railroad line.

The short-term impacts would include disruption of vegetation and farming caused by:

- Preparing equipment yards and construction trailer sites

- Clearing, grubbing and grading for installation of the Converter Station
- Clearing, grubbing, grading and drilling hole foundations for installation of transmission poles
- Temporary closure of access to livestock and farm irrigation, tilling and harvesting operations

With the exception of the Converter Station, the short-term disturbances to vegetation would be repaired soon after construction is completed. Most disturbances to farming would be expected to be infrequent and last only a day per disruption. Closure of access to livestock and farm irrigation, tilling and harvesting operations will be minimized to reduce local occupational disruption.

The long-term impacts would include disruption of vegetation and farming caused by:

- Installation of two-track access roads
- Ongoing maintenance along the route of the power line
- Construction of the Converter Station and installation of a section line road to access the site
- Loss of crops, hay or livestock forage within the ROW and the construction area for the Converter Station

The cumulative impact of the construction and operation of the Rapid City DC Tie Project will have minimal effect on land use. The primary land use in this project area consists of ranching and farming; these practices have been changing the landscape for many years. Future practices may continue to change land use. This and future projects should have minimal impacts on land use.

- e. **Local Land Use Controls.** The proposed transmission facilities are located predominantly on private land that is zoned agricultural and is regulated by Pennington County land use plans and ordinances. There are no rezoning permits required by Pennington County for the construction, use and maintenance of the proposed transmission facilities.

A Pennington County conditional use permit is required for the construction of the Converter Station. The county zoning will remain agricultural because the Converter Station site acreage is 40 acres. On March 5, 2002, the Pennington County Board of County Commissioners unanimously approved the issuance of Conditional Use Permit 02-12 to construct the Converter Station on the Converter Station Site. The city of Rapid City Planning Commission also approved construction of the Converter Station, pursuant to SDCL 11-6-19, on April 25, 2002.

11. TIME SCHEDULE

The time schedule for this project is graphically depicted on the Gantt Chart attached hereto as Exhibit 3. The Rapid City DC Tie Project started in December 2000 and project completion is expected by October 2003. The critical path in this schedule involves design, procurement and installation of the Converter Station. The parallel critical path is the South Dakota PUC Permit

Application, hearing and permitting process, followed by any necessary eminent domain procedures and subsequent transmission line construction.

12. COMMUNITY IMPACT

- a. **Forecast of Socioeconomic Impact.** No significant adverse socioeconomic impacts to the local communities and governmental facilities or services are anticipated as a result of the construction and maintenance of the proposed transmission facilities. It is expected that the project will provide socioeconomic benefit by providing employment opportunities, increased demand for locally supplied construction equipment, and increased reliability of available electrical power and additional power for a rapidly expanding area of Pennington County.
- b. **Forecast of Taxation Impacts.** No significant immediate or long-term adverse impact on property and other taxes of the affected taxing jurisdictions are anticipated as a result of the construction and maintenance of the proposed transmission facilities.
- c. **Forecast of Agricultural Impacts.** Short-term impacts to agriculture are expected to last no more than a day per disruption and would primarily impact access to livestock and farm irrigation, tilling and harvesting operations. The small conversion of agricultural land to the transmission line ROW and substation construction area are expected to have minimal impact on the overall crop production within the proposed project corridor.
- d. **Forecast of Population and Community Impacts.** The proposed transmission project is not expected to substantially impact the population, income, occupational distribution or the integration and cohesion of the adjacent communities. The population of Pennington County in 2000 was estimated at 88,565 (Census 2001) and is not expected to change on

a short-term basis as a result of this project. However, increased electric power availability in the area could facilitate long-term population growth

e. **Forecast of Transportation Impacts.** No significant direct, indirect or cumulative impacts are expected to the transportation systems of cities, counties and the state. Short-term impacts may include minor traffic delays caused when wires are strung across roadways or rail lines. Any such short-term roadway or railway closings would be scheduled with appropriate authorities and marked clearly, and detour routes would be provided as necessary. Construction of the proposed project would be expected to cause only insignificant adverse transportation effects to public access as a result of roadway congestion from workers' vehicles.

f. **Forecast of Cultural Resource Impacts.** Applicant has conducted a records search and an on-site cultural resources inventory of the project area. The results of the cultural resources study are discussed in Section 5.4 of the Environmental Report located in Appendix C of Applicant's PUC Permit Application. The proposed project corridor contains five sites and several ditches that could be considered eligible for inclusion on the National Register of Historic Places ("National Register"). The proposed project is expected to have minimal impact on these cultural resources of the area as long as construction does not disturb the aboriginal stone cairns at two of the sites discussed in the Environmental Report. During construction and maintenance of the proposed transmission facilities, Applicant will not disturb areas noted as eligible for inclusion on the National Register

13. EMPLOYMENT ESTIMATES

Transmission line and Converter Station construction would employ 30 to 60 workers for a period of 6 to 12 months. No more than 60 construction workers would be required throughout

this construction period. According to the South Dakota Governor's Office of Economic Development, in 1999 there were 1,998 workers employed in the mining and construction industry. An additional 60 workers for one year would be approximately a three percent increase in the mining and construction industry sector. It is expected that the majority of the construction work force will be native to the Rapid City metropolitan area. Local employees will maintain the proposed transmission facility, if necessary. No permanent additional employment is expected.

14. FUTURE ADDITIONS AND MODIFICATIONS

Applicant does not request approval of any future additions or modifications under this permit Application. The converter site includes space for a future 230/69 kV delivery point for its member, Rushmore Electric Power Cooperative; however, the timing, cost and other details of that facility are unknown at this time.

15. TRANSMISSION FACILITY LAYOUT AND CONSTRUCTION

- a. **Vegetation Clearing.** The transmission line would cross primarily rangeland and cropland and as such no extensive tree clearing or removal will be needed during the construction of the line. Only trees that would affect the transmission line directly will be removed, and such removal will be mitigated by planting replacement trees (approximately three (3) feet in height) in nearby areas such that they will not interfere with the lines. Vegetation will be cleared as needed in a few areas of the ROW for construction and maintenance of the line. After construction is complete, any compacted soil will be tilled and the area would be reseeded with native grasses and forbs. Because of their slower growth and establishment, shrubs would be replaced with container-grown plants to decrease time for establishment.

- b. **Soils.** Suitable soils removed during borings for the direct embedded transmission line structures will be used for backfill. Any remaining material will be spread and mounded near the base of the transmission line structures. Excavated soils from drilled pier foundations for the single-pole structures will be hauled off-site to a location as directed by the landowners. After construction is complete, any compacted soil will be tilled and the area would be reseeded with native grasses and shrubs.

All areas disturbed by construction of the Converter Station will have the topsoil removed and stockpiled for future use. Best management practices will be used to minimize any sediment and provide for erosion control. In addition, Applicant will follow the recommendations of the district conservationist to minimize soil erosion.

- c. **Herbicides and Sterilants (Weed Control).** Because the primary land use along the transmission line corridor is rangeland and cropland, it would not be necessary to use herbicides or sterilants for construction of the proposed transmission line. All areas within the Converter Station fence line and the access road to the Converter Station site would be surfaced with a six-inch layer of gravel. Upon completion of construction of the Converter Station, a soil-applied herbicide would be applied to all gravel surfacing for vegetation control. Any herbicides used in ROW maintenance will be approved by the U.S. Environmental Protection Agency and applied by licensed professionals. Application of herbicides will be limited to the extent necessary for regular maintenance of the transmission system.

- d. **Construction Site Access.** A new road along the section line will be built to provide access to the Converter Station site. This road will be approximately one mile in length. All other access would be on existing approaches or existing roads. Best management

practices will be implemented to minimize erosion and sedimentation, runoff and surface instability during access road construction. Any and all approvals from Pennington County required for the construction of this road will be obtained prior to commencement of construction thereof.

- e. **Waste Disposal.** All waste generated during the construction of the project will be disposed of in an approved landfill on a regular basis. Trash and scrap will be deposited in waste containers or otherwise controlled and managed on site prior to ultimate disposal.
- f. **Restoration and Revegetation.** All disturbed areas will be seeded, mulched and revegetated in consultation with the local district conservationist or county extension office as soon as possible after construction has been completed in any particular area. Landowner desires will also be considered in determining seed type depending on the adjacent land use. The entire line will be inspected one year after construction to evaluate the success of the restoration. Reseeding will be performed as necessary.

16. INFORMATION CONCERNING TRANSMISSION FACILITIES

- a. **Configuration of Towers and Poles.** Three basic structure types would be used for the proposed transmission line. Typical structure configuration drawings with dimensions proposed for the tangent structures (excludes structures required at angle points) are provided in Exhibit 4 hereof. The single pole, single circuit steel structure would be used from the South Rapid City Substation for the first segment of the line to the intersection of an existing 69 kV line one-half mile east of South Dakota Highway 79. The single pole, double circuit steel structure would be used near South Dakota Highway 44. Two-pole H-frame wood or steel structures would be used to the New Underwood Substation. Guyed poles would be used for the angle structures on the H-frame segment. Self-supporting

(un-guyed) structures would be used for all other angle structures in the project. The steel structures will range from approximately 90 to 120 feet in height. The H-frame structures will use primarily 80 to 90 foot steel poles and be direct embedded into the ground 10 to 11 feet, giving an above-ground height of approximately 70 to 80 feet. Structures will be spaced approximately 750 feet apart, but this distance will vary significantly based upon terrain.

b. **Conductor Configuration.** Two conductors would be used for the proposed transmission line. The 230 kV circuit would use a 1272 million circular mils (MCM) aluminum conductor steel reinforced (ACSR) conductor, 45/7 stranding, Code Word "Bittern". The 69 kV circuit conductor would be a 795 MCM ACSR, 45/7 stranding, Code Word "Tern". In addition, a single 3/8-inch extra high strength overhead shield wire and a single fiber optic cable with 12 pairs of fibers would each be supported from the pole tops.

c. **Reliability and Safety.** The Rapid City DC Tie Project facilities will be constructed in full compliance with all applicable National Electrical Safety Code electrical performance and safety codes and will not present significant impacts posed by safety or electrical hazard to the general public. The flow of electricity produces electric and magnetic fields (commonly referred to as EMF). Numerous sources of EMF exist in nature and in the occupational and residential environment. In nearly all instances, these fields pose no obvious threat to human health or safety. Certain epidemiological investigations have indicated potential risk factors from exposure to EMF. However, many similar studies report no statistically significant correlation.

Thus, although a substantial amount of research on EMF has been completed and is continuing, the body of research on health effects is still preliminary and inconclusive. The

emerging evidence no longer allows the assertion that there are no risks. Still, there is no basis for asserting that there is a significant risk. Because the majority of the proposed alignment will be located in rural, undeveloped areas, the potential for effects is further diminished and direct, indirect and cumulative impacts are not anticipated to be significant.

A new Converter Station would operate along with the proposed transmission line

Operation of the Converter Station would present a potential safety and electric hazard to the general public because of the high voltage that passes through the Converter Station.

The hazard would be effectively mitigated by construction of a fence with warning signs posted at appropriate intervals surrounding the Converter Station.

- d. **Right of Way or Condemnation Requirements.** The 40-acre tract of land upon which the Converter Station will be built has been purchased by Applicant. Approximately 19.61 miles of the required right-of-way for the transmission line has been acquired. The remaining right-of-way is yet to be acquired from two (2) remaining landowners. It is hoped that negotiations for acquisition on a mutually agreed basis will be successful. However, condemnation proceedings or other litigation might be required if those negotiations are not successful.

- e. **Necessary Clearing Activities.** No significant clearing activities are anticipated for the proposed transmission facilities, although several large cottonwood trees located on private property will have to be removed and replaced if possible. The landowner has been informed and understands the need for removal for safety and reliability reasons.

The majority of clearing activities would be concentrated at the proposed Converter Station site. Between 20 and 25 acres of the 40-acre site would need to be cleared of

vegetation for construction.

- f. **Configuration of Underground Facilities.** No underground facilities would be required for the proposed transmission facilities.

- g. **Additional Information in Application.** Applicant's Permit Application contains all information necessary for the local review committees to assess the effects of the proposed facilities pursuant to SDCL 49-41B-7 and 49-41B-11. The Permit Application also contains all information necessary to meet the burden of proof specified in SDCL 49-41B-22.

AMENDMENT OF AND ADDITION TO PERMIT APPLICATION

- a. **Amendments.** The Application filed October 11, 2001 is hereby amended as follows:
 - 1. The transmission line route attached to the Application as Appendix A is hereby amended to conform to the description set forth on Exhibit 2 to this Stipulation.

 - 2. The reference in Section 2.12.1 (page 18) of the Application to removal of 20 acres of prairie dog town is hereby amended to reference the removal of up to 50 acres of black-tailed prairie dog town.

 - 3. The captions on the photographs 4 and 9 included in the Project Photographic Log attached as Appendix A to the Environmental Report (included as Appendix C to the Application) are hereby amended to read as set forth in Exhibit 5 to this Stipulation.

- b. **Addition.** The audible noise level associated with the operation of the Converter Station (as measured at the perimeter fence) will range from 55 decibels (audible noise level commonly associated with a home) to 61 decibels (audible noise level commonly associated with an office).

CONCLUSIONS OF LAW

1.

The Commission has jurisdiction over the subject matter and parties to this proceeding pursuant to SDCL Chapter 49-41B and ARSD 20:10:22. Subject to the findings made on the four elements of proof under SDCL 49-41B-22, the Commission has authority to grant, deny or grant upon such terms, conditions or modifications of the construction, operation and maintenance of the transmission facility as it may deem appropriate.

2.

The proposed transmission line is a "transmission facility" as defined in SDCL 49-41B-2.1(2).

3.

The Applicant's Permit Application, as amended, complies with the applicable requirement of SDCL Chapter 49-41B and ARSD 20:10:22.

4.

The Rapid City DC Tie Project as defined herein will comply with all applicable laws and rules, including all requirements of SDCL Chapter 49-41B and ARSD 20:10:22.

5.

The Rapid City DC Tie Project, if constructed in accordance with the terms and conditions of this permit, will not pose a threat of serious injury to the environment or to the social and economic conditions of inhabitants or expected inhabitants in the siting area.

6.

The Rapid City DC Tie Project, if constructed in accordance with the terms and conditions of this permit, will not substantially impair the health, safety or welfare of the inhabitants of the siting area.

7.

The Rapid City DC Tie Project, if constructed in accordance with the terms and conditions of this permit, will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

8.

The Commission has the authority to revoke or suspend any permit granted under the South Dakota Energy Facility Permit Act for failure to comply with the terms and conditions of the permit pursuant to SDCL 49-41B-33.

9.

Upon transfer of an undivided 35% ownership interest in the Rapid City DC Tie Project as stated in the Findings of Fact, Black Hills will be a permitted owner of the Rapid City DC Tie Project.

10.

The Applicant has met its burden of proof pursuant to SDCL 49-41B-22 and is entitled to a permit as provided in SDCL 49-41B-25, subject to the following:

STIPULATE TO THE FOLLOWING TERMS AND CONDITIONS:

1.

The Applicant will obtain all governmental permits which may be required by any township, county, state or federal agency or any other governmental unit for construction activity prior to engaging in the particular activity covered by that permit. Copies of any permits obtained by the Applicant shall be sent to the Commission.

2.

In order to ensure compliance with the terms and conditions of this permit pursuant to SDCL 49-41B-33, it is necessary for the enforcement of this Order that all employees, contractors and agents of the Applicant, and Black Hills, to the extent of its interest, involved in this transmission line project be made aware of the terms and conditions of this permit.

The Applicant shall ensure that its employees, contractors and agents involved in right-of-way negotiations and acquisitions, right-of-way clearing, line construction and right-of-way and line maintenance understand fully and comply with the terms and conditions of this permit.

3.

If during construction, the Applicant or its agents discover what may be an archaeological resource, the Applicant or its agents shall immediately cease work at that portion

of the site and notify the Commission and the State Archaeologist. If such an archaeological resource is discovered, the Applicant shall develop a plan which is acceptable to the State Archaeologist to salvage, avoid or protect the archaeological resource. If such a plan would require a different route than that approved by the Commission, the Applicant must seek Commission approval for the new route before proceeding with any further construction.

4.

In order to mitigate interference with agricultural and ranching operations during and after construction, the Applicant shall locate all structures, to the extent feasible and prudent, to minimize adverse impact and interferences with agricultural operations, shelter belts and other land uses or activities. The Applicant shall take appropriate precautions to protect livestock and crops during construction. The Applicant shall repair all fences and gates removed or damaged during construction or maintenance unless negotiated with the landowner or designee. The Applicant shall be responsible for the repair of private roads and lanes damaged when moving equipment or when obtaining access to the right-of-way.

5.

The Applicant shall provide each landowner across whose property the facility is to be constructed with the following information:

A copy of the Commission's Order.

Detailed safety information describing (a) reasonable safety precautions for existing activities on or near the right-of-way; (b) known activities or uses that are presently prohibited within the right-of-way; (c) other potential dangers or limitations within the right-of-way.

of the site and notify the Commission and the State Archaeologist. If such an archaeological resource is discovered, the Applicant shall develop a plan which is acceptable to the State Archaeologist to salvage, avoid or protect the archaeological resource. If such a plan would require a different route than that approved by the Commission, the Applicant must seek Commission approval for the new route before proceeding with any further construction.

4

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A copy of the Commission's Order.

Detailed safety information describing (a) reasonable safety precautions for existing activities on or near the right-of-way; (b) known activities or uses that are presently prohibited within the right-of-way; (c) other potential dangers or limitations within the right-of-way

The Commission's address and phone number.

The Applicant shall also comply with all other terms and conditions as set forth in the Findings of Fact.

6.

The terms and conditions of the permit shall be made a uniform condition of construction, subject only to an affirmative written request for an exemption addressed to the Commission. A request for an exemption shall clearly state which particular condition should not be applied to the property in question and the reason for the requested exemption. The Commission shall evaluate such requests on a case-by-case basis.

7.

Before commencing construction, the Applicant shall furnish an indemnity bond in the amount of Ten Thousand Dollars (\$10,000.00) to comply with the requirements of SDCL 49-41B-38.

8.

If radio or television interference is caused by the presence or operation of the transmission line, the Applicant shall take all appropriate action to restore or provide reception equivalent to reception levels in the immediate areas just prior to construction of the transmission facility. This mitigation requirement shall apply to homes or other structures in place at the time of construction but shall not apply to any dwellings or other structures built


after construction of the Converter Station and transmission facilities approved in this Permit
have been completed.

Dated June 18, 2002.

BLACK HILLS POWER, INC.

By 
Steven J. Heimers
Senior V.P. & General Counsel

BASIN ELECTRIC POWER COOPERATIVE

By 
James K. Miller
Manager, Environmental Services



Karen Cremer
Staff Attorney
South Dakota Public Utilities Commission

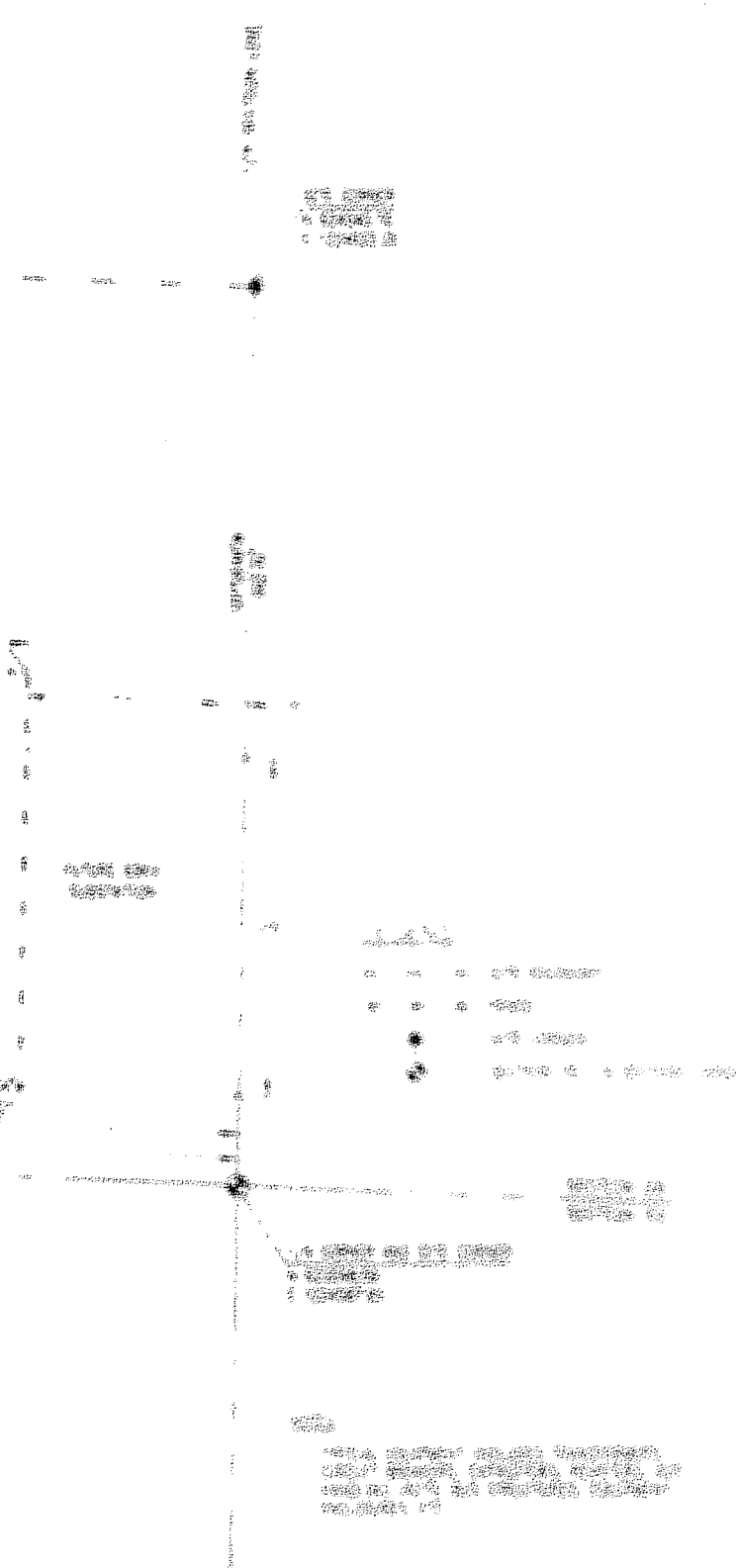
Exhibit 1

General Arrangement Drawing of Converter Station

DESCRIPTION

THE SOUTH HALF OF THE SOUTHEAST QUARTER OF SEC. 28,
THE SOUTH HALF OF THE NORTH HALF OF THE SOUTHWEST
QUARTER, THE SOUTHEAST QUARTER OF THE
OF THE SOUTHWEST QUARTER EXCEPT THE WEST CORNER
THEREOF, AND THE SOUTH HALF OF THE NORTHEAST AND
WEST QUARTER OF THE SOUTHWEST QUARTER EXCEPT THE
TWENTY FEET THEREOF, ALL IN SECTION 28, TOWNSHIP
OF THE BLACK HILLS MERIDIAN, PENNINGTON COUNTY,
CONTAINING 49 ACRES MORE OR LESS.

29 28
32 33



SCALE 1" = 100'
SD STATE PLANE COORDINATES
1983 DATUM - SOUTH ZONE FEET

**SITE PLAN
AND BOUNDARY LIMITS**

UNIVERSITY OF SOUTHERN CALIFORNIA

Exhibit 2

Centerline Description

PART A

The Surveyed Legal Description for the Rapid City Tie Project set forth in Appendix A of the Application filed October 11, 2001, shall be revised to read as follows:

Segment	Bearing	Distance	
*Takeoff – AP1	S 65-39-43 E	320.67	
AP1 – AP4	S 87-46-12 E	6096.12	
AP4 – AP6	N 85-39-54 E	545.79	
AP6 – AP7	S 87-29-08 E	2350.95	
AP7 – AP8	S 69-58-59 E	435.64	
AP8 – AP9	S 88-01-17 E	2481.01	
AP9 – AP10	S 02-07-11 W	5178.31	
AP 10 – CONV SITE	S 87-54-21 E	3505.10	
IN SITE	S 87-54-21 E	1760.32	
AP11 – AP11A	S 77-15-41 E	682.72	
AP11A – AP12	S 87-50-40 E	15338.12	
AP12 – AP13	S 88-09-15 E	16622.35	
AP13 - AP14	N 84-50-27 E	2017.80	
AP14 - AP15	N 41-46-06 E	12444.66	
AP15 - AP16	N 59-36-14 E	21253.36	
AP16 – AP17	S 87-58-22 E	18256.76	
AP17 – AP19	S 88-33-32 E	10789.63	
AP19 – TAKE OFF	N 12-49-27 E	<u>1626.88</u>	End of Project
		119051.40	(22.66 miles)

Exhibit 3

Gantt Chart Showing Construction Timeline

Rapid City DC Tie Project Schedule

06/01/02

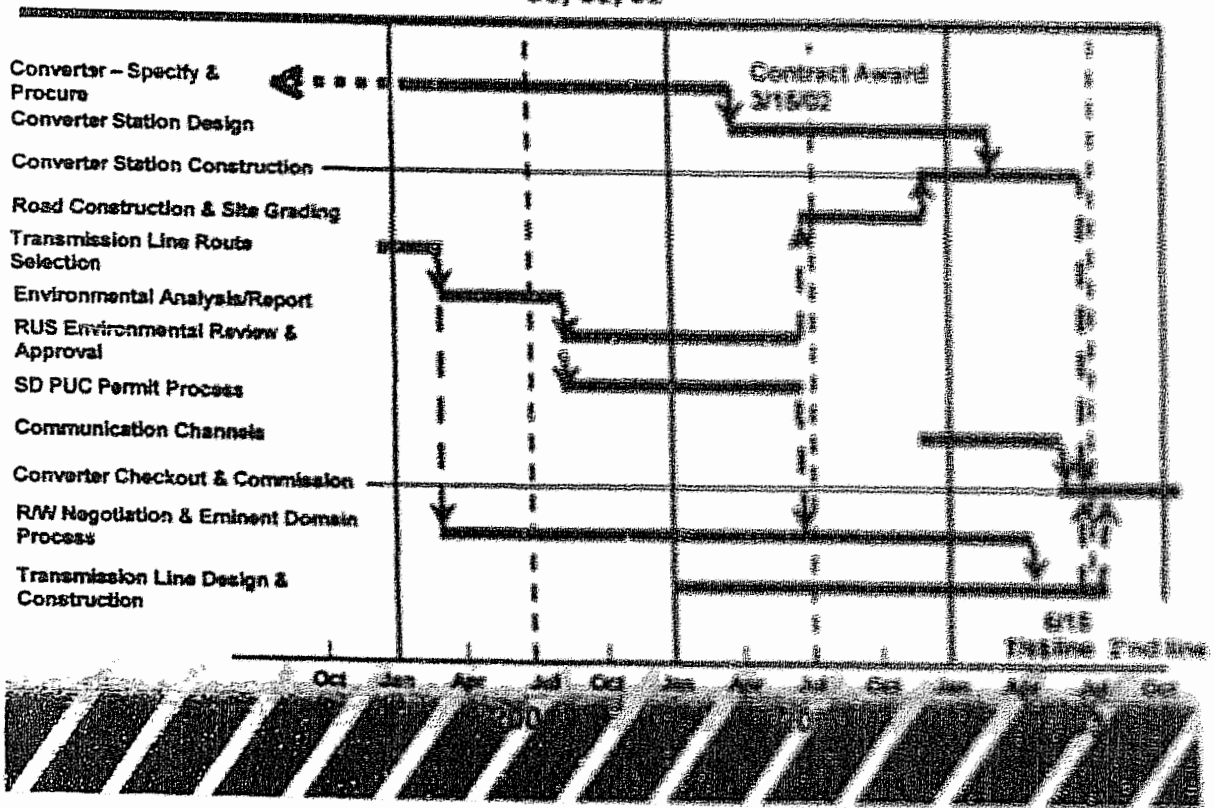
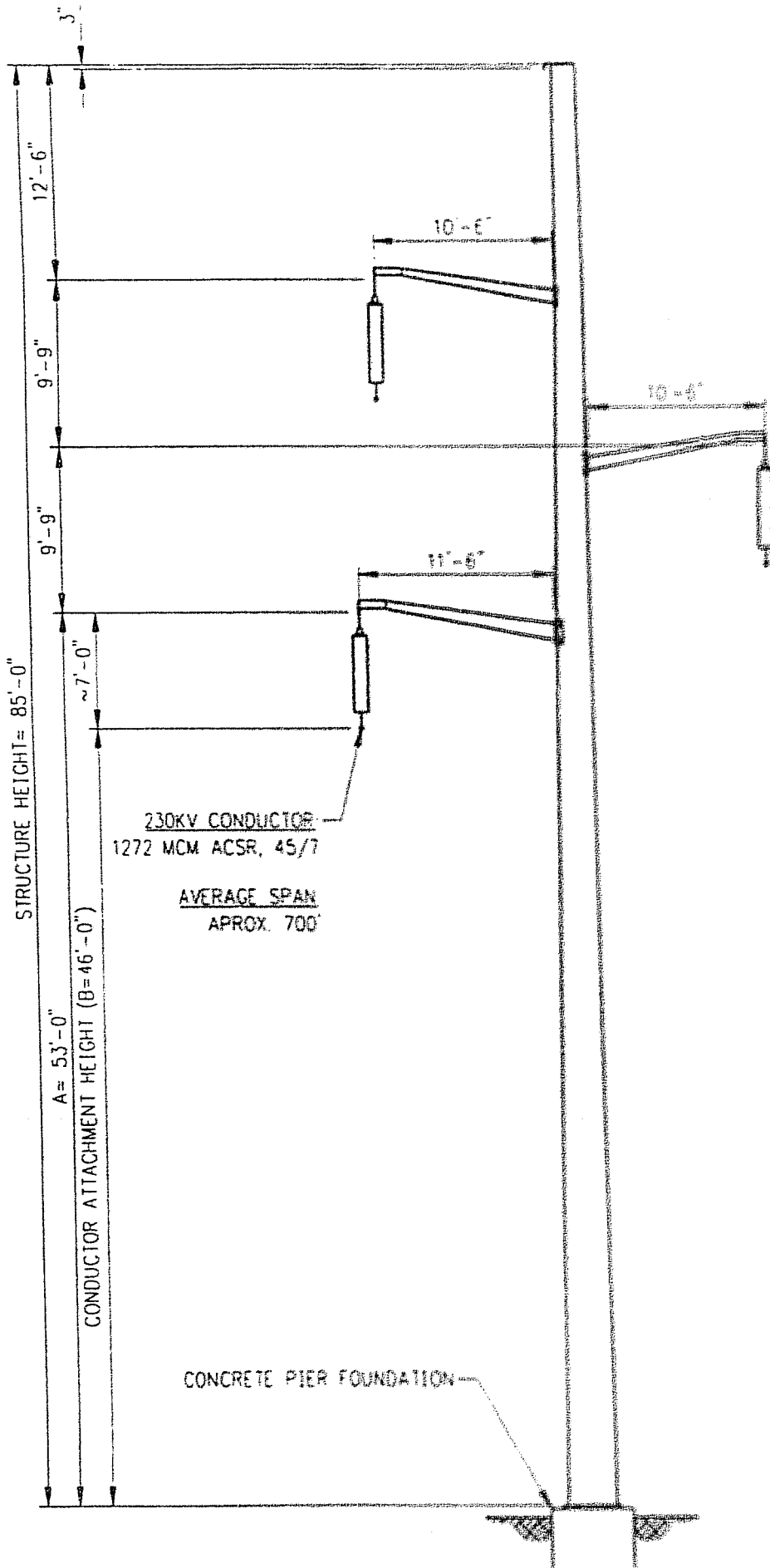
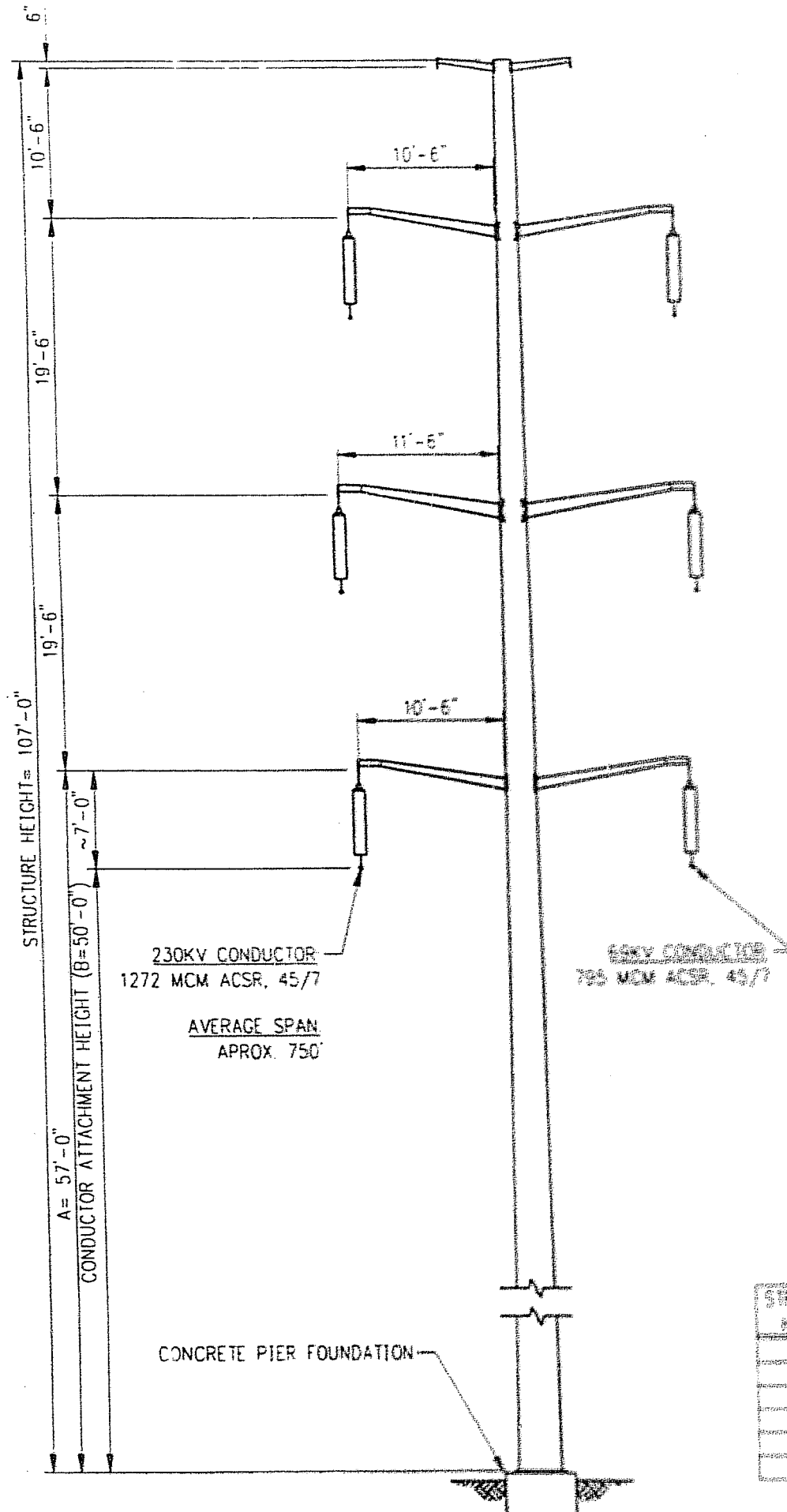


Exhibit 4

Structure Configuration Drawings

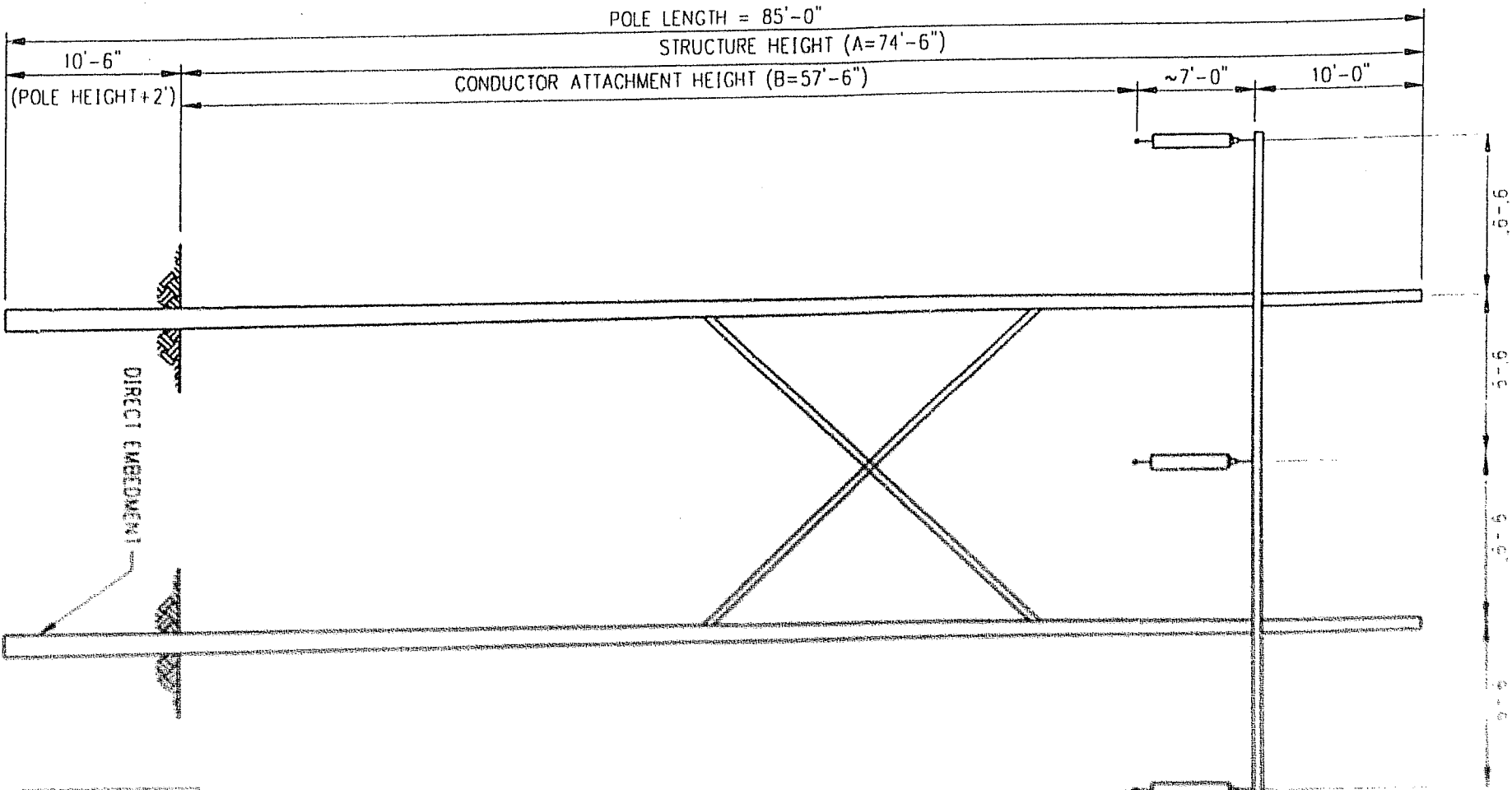


1	2	3
4	5	6
7	8	9
10	11	12



STRUCTURE HEIGHT	CONDUCTOR ATTACHMENT HEIGHT	AVERAGE SPAN
107'-0"	57'-0"	750'
101'-0"	51'-0"	700'
95'-0"	45'-0"	650'
89'-0"	39'-0"	600'
83'-0"	33'-0"	550'
77'-0"	27'-0"	500'

TYPICAL STEEL STRUCTURE (TYPE: DT)

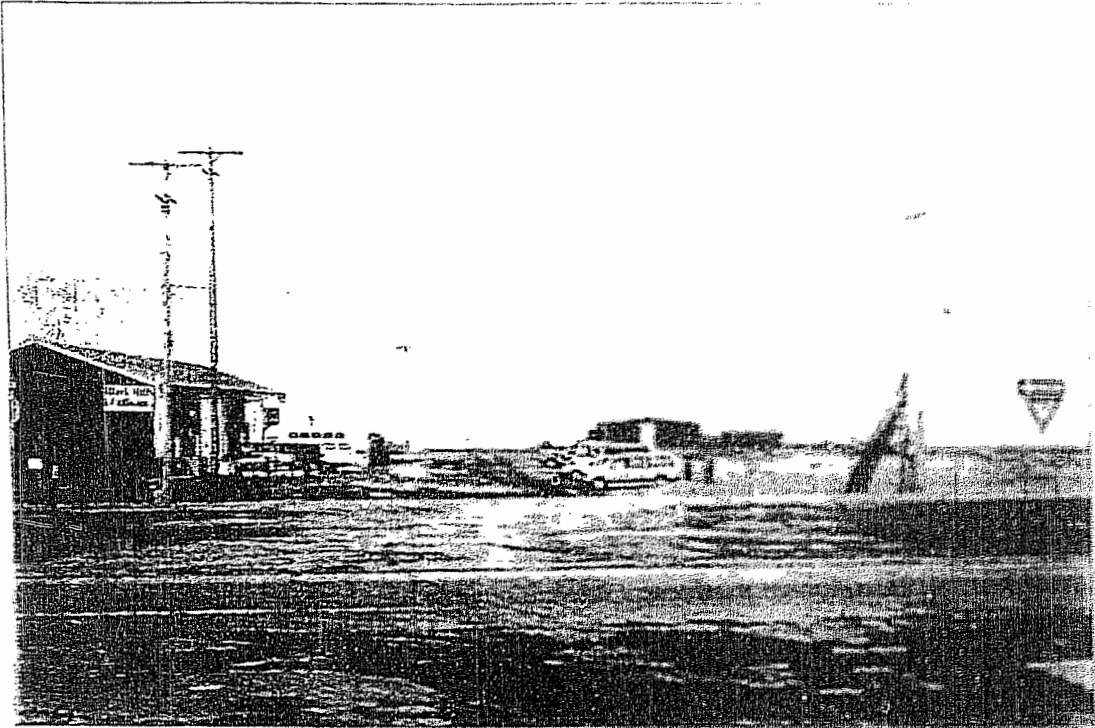


TYPICAL STEEL H-FRAME STRUCTURE (TYPE HS)
230KV SINGLE CIRCUIT

NO.	DESCRIPTION	QTY	UNIT	REMARKS
1	STEEL H-FRAME	1	EA	
2	CONDUCTOR	1	EA	
3	INSULATOR	1	EA	
4	ANCHOR BOLT	4	EA	
5	WASHER	4	EA	
6	NUT	4	EA	
7	BRACKET	2	EA	
8	WELDING	1	EA	

Exhibit 5

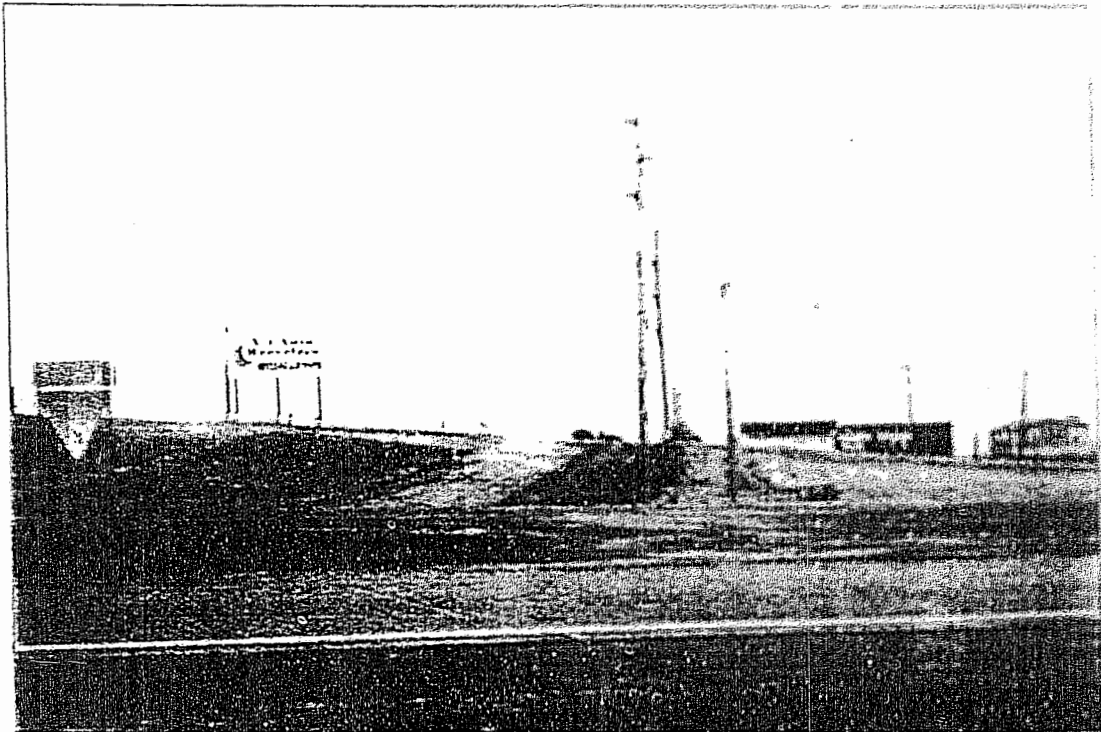
Photographs



Photograph No. 3

Date April 5 2001

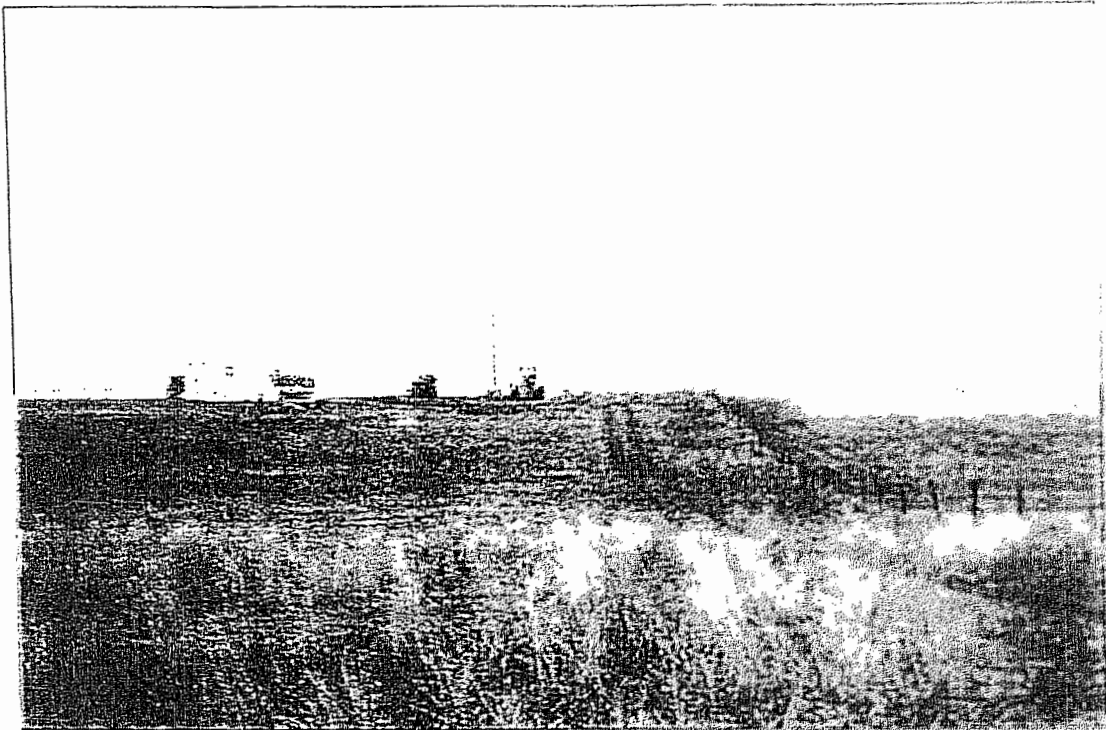
Description: Looking east at crossing of Highway 79 Note corral and building that may be relocated



Photograph No. 4

Date April 5 2001

Description: Looking east from Highway 79 crossing for Alternative Route #2 and south turnpoint for preferred route.



Photograph No. 9
Description: Mobile home that may be relocated

Date April 5, 2001



Photograph No. 10
Description: Rangeland prairie dog colony

Date April 5, 2001