ALTERNATIVES STUDIED TO MINIMIZE
THE IMPACT ON THE
PORT HUDSON BATTLEFIELD
NATIONAL HISTORIC LANDMARK

I. Introduction

In the fall of 1973 Gulf States Utilities (GSU) Company submitted the River Bend Station Environmental Report (ER) to the Atomic Energy Commission (today the Nuclear Regulatory Commission (NRC)) as part of its application for construction permits for the then proposed River Bend Station Units 1 and 2. In this ER GSU described, among other things, the anticipated transmission line routes and facilities necessary to intertie the River Bend Station with the remainder of its grid system. This description contained the potential environmental effects of the lines and included such things as the amounts and types of land to be traversed, possible effects on known archaeological and historical sites, and alternate routes and their effects.

After reviewing the ER for all aspects of the proposed project (to include the transmission lines), the Atomic Energy Commission issued a Draft Environmental Statement and followed this with a Final Environmental Statement published in September 1974. Public hearings were also held on the environmental matters in the spring of 1975 and the NRC summarized its approval of the River Bend Project on all environmental subjects (except the Appendix I dose pathway) in its Partial Initial Decision of September 2, 1975 and issued a Limited Work Authorization (LWA) on September 5, 1975. The LWA allowed site preparation and clearing activities to commence to include on-site transmission route clearing and the initiation of construction support facilities. The completion of the Construction Permit

proceedings came after another year-and-a-half of regulatory review and the Construction Permits were issued on March 25, 1977 allowing safety related and off-site construction activities to proceed.

In late 1976, it became evident to the GSU transmission line engineering group that the construction of the new Big Cajun No. 2 Units 1 and 2 just to the west and across the Mississippi River from the River Bend Station would require partial re-routing of some of the transmission lines stated in the ER. This re-routing was deemed necessary to tie the Big Cajun No. 2 station into the existing GSU grid system. Since the inception of the Cajun Electric Power Cooperative (Cajun) in the late 1960's as only a power generation cooperative, GSU has provided transmission interconnects to Cajun and its member distribution cooperatives. Joint engineering studies between GSU and Cajun were performed to determine the most efficient method of interconnection. Therefore it was decided to partially re-route Line Route B (as labeled in the ER) to tie into Big Cajun No. 2 and to be in-service to accommodate the commercial operation (late 1979) of Unit 1. Today that portion of Line Route B necessary to support commercial operation of Unit 1 is constructed and operational. Other minor changes occurred to Line Routes A and C while Line Route D was completely and more efficiently redesigned.

As a result of the construction of the above mentioned new Big Cajun No. 2 Units 1 and 2, two things became evident to GSU - 1) partial re-routing of the lines as stated in the ER would have to be done, and 2) the in-service dates for Line Routes B and C as stated in the ER would now be moved ahead and tied to the projected commercial operation dates of Big Cajun No. 2 Units 1 and 2 respectively. Also, GSU realized that since the

transmission routes were part of the River Bend ER, it would be necessary to perform environmental evaluations of the re-routings prior to constructing them.

II. Need for Study

After having completed its assessment of the potential environmental impacts for the proposed re-routings of the transmission routes necessary to accommodate the Big Cajun No. 2 Units 1 and 2, GSU in July-August 1979 sought public comment as required by the U. S. Army Corps of Engineers on the new construction of the Mississippi River crossing for the route from River Bend to Big Cajun. Public comment centered on the potential impact of the River Bend transmission routes on known, potential, and unknown archaeological and historical sites in the vicinity of the routes. GSU also received a letter from the State of Louisiana Department of Culture, Recreation, and Tourism Office of Program Development Division of Archaeology and historic Preservation requesting that GSU perform an archaeological and historic site survey that would meet the requirements of the Advisory Council on Historic Preservation (ACHP). After some discussion as to what was required by such a survey (i.e. checking for known sites and sites already classified as eligible or to also actually explore for unknown sites or potential sites), GSU had a survey performed to fulfill 36CFR 800 requirements of not only the proposed re-routings but also the entire lengths of each line route radiating from River Bend.

The first part[1] of the survey was completed in late spring 1978 and the remaining part[2] was completed in August 1978.

From the above survey it was determined that no known, eligible, or potential archaeological or historical sites would be affected by the re-routing of the transmission lines to accommodate the Big Cajun No. 2 Units 1 and 2. Therefore GSU finalized the re-routing plans and, as stated previously, put a portion of Line Route B inservice in early spring 1979. However an unchanged portion of the proposed Line Route C which parallels two existing GSU lines was found to traverse the Port Hudson Battlefield National Historic Landmark. This Landmark was neither in the National Register nor labeled as eligible for the National Register when GSU originally prepared the River Bend ER. Regardless, GSU met with the State of Louisiana Division of Archaeology and Historic Preservation and reviewed the potential for impact on the Landmark. From this it was determined that if GSU would agree to take certain mitigating actions to minimize the construction effect, the State would approve the Route C through the Landmark. GSU reviewed the proposed mitigating actions transmitted by the State in a letter from Mr. E. Bernard Carrier dated September 21, 1978 and responded that it would adhere to them in a return letter dated February 5, 1979.

After completing the review with the State and having received State approval, GSU submitted copies of the archaeological and historical site

---

[1] Neuman, Dr. Robert W., "An Archaeological and Historical Site Survey of the River Bend Station Transmission Line B," June 7, 1978.

[2] Neuman, Dr. Robert W., "Cultural Resource Survey of the Gulf States Utilities Transmission Line Right-of-Ways, Louisiana," August, 1978.

surveys and letters between GSU and the State to the NRC. Upon reviewing this information, the NRC contacted the ACHP on the Line Route C through the Port Hudson Battlefield National Historic Landmark. In a letter dated August 16, 1979 the NRC informed GSU that the NRC was required to make an effect determination according to 36CFR 800 on the Line through the Landmark and that GSU should not proceed with any clearing or construction activity within the boundary of the Landmark.

On August 23, 1979 representatives of GSU, the NRC, and the State of Louisiana met in Baton Rouge to discuss the Route C impact on the Landmark and to tour the area. From this meeting, the NRC requested that GSU provide information concerning alternate routes to avoid the Landmark area and other construction methods that could be used on the proposed Route C. With this information the NRC could complete its 36CFR 800.13(b) Preliminary Case Report.

Therefore, from the above summary of events, it is evident that a portion of Line Route C as labeled in the River Bend ER traverses the Port Hudson Battlefield National Historic Landmark while paralleling existing transmission lines. Because of the Landmark status of the Battlefield and the NRC's application of the ACHP regulations as stated in 36CFR 800, GSU has further studied two alternate transmission routes that would avoid the Landmark area and GSU also has studied two alternate construction methods for using the proposed Route C.

III. Basis of Study

Upon examination of the three construction methods studied in the Attachment 1, and the three routes examined in Attachment II and illustrated in Exhibit A, five alternatives to avoid or mitigate adverse effects on the Battlefield area are compared to the proposed route/method combination in terms of economic and environmental costs. Each alternative is considered for comparison purposes to extend from a point north of the Battlefield area where the three routes separate, to the Port Hudson Substation where they once again become common. The length of the proposed route within the Battlefield boundaries is approximately 46,875 feet.

Base Proposal: Standard tubular steel pole H-frame structures on adjacent and contiguous right-of-way to existing lines and using standard construction methods.

Alternative 1: Use special design large, tubular steel, five circuit, H-frame towers to combine new and existing circuits on one set of structures to reduce the number of structures located within the Battlefield area.

Alternative 2: Use underground pipe type cable to install the two new circuits underground in Battlefield area leaving existing circuits overhead in adjacent right-of-way.

Alternative 3: Use underground pipe type cable to install two new and three existing circuits underground in existing and additional right-of-way in Battlefield area (all lines underground).

Alternative 4: Reroute the two new circuits in a new route east of the Battlefield area.

Alternative 5: Reroute the two new circuits in a new route west of the Battlefield area.

IV. Impact of Alternatives

A. Base Proposal

Tubular Steel 230kV double circuit H-frame structures have been a standard on Gulf States Utilities transmission system since 1969. This is also a commonly used type of structure for this voltage with many other utilities across the country. The Base Proposal is explored for its impact on the Port Hudson Battlefield National Historic Landmark due to use of this type of construction.

Impact

R/W Width Required (Additional)	Varies 75 to 155 ft.
Length of Line	50,995 ft.
Existing R/W Width Cleared	Varies 150 to 210 ft.
R/W Width to be Cleared (Additional)	Varies 75 to 155 ft.
R/W Acres to be Cleared (Additional)	113.6 ac.
Estimated Cost	$3,760,186
Ratio of Cost to Base Proposal	1.0

Advantages

Cost - This is the most economical route/method considered.

Reliability - This is the most reliable of all alternatives. It is considerably more reliable than the five circuit towers or the underground cable. It is also more reliable than the alternate east and west routes because it is the shortest most direct route.

In-Service Date - The base proposal is the only alternative which can be installed in time to meet the required in-service date of November 3, 1980 for the second unit of Big Cajun No. 2. All other alternatives will cause extensive delays to the completion of this project and will jeopardize service reliability to the GSU transmission system in the Baton Rouge area and to Cajun member co-ops as well as generation stability at Big Cajun No. 2.

Standard Design - The proposed method of construction utilizes standard design structures which for many years have been selected as the most economical and reliable method of construction.

Multiple R/W Use - This alternative takes maximum advantage of the multiple right-of-way land use principal in that the entire route is parallel to existing transmission lines, pipelines, and railroads. This produces the most acceptable compromise between economics and environmental impact.

Maintenance - Because of the standard nature of this design and the frequent use of this type of structure, spare structures or components would normally be available for repairs in emergencies. This would greatly increase reliability and reduce outage time in event of a structure failure.

Resources Committed - Due to the long lead time for material delivery, considerable economic investment would be irretrievably lost should the base proposal be abandoned. Approximately $120,000.00 has been spent to date on this line route. Approximately $1,503,000 has been committed in purchase contracts for steel pole and 62% of the Right-of-Way has been purchased at a cost of $1,092,000. Total commitment is $2,715,000.

Construction Methods - The methods required for this type of construction will have the least impact on the environment and the archaeology of the area. The structures require a smaller amount of backfill, 3.4 cu. yds. per structure, which will be soil from the excavation where conditions permit. Only a small volume of concrete will be needed, if at all. These lighter weight structures will cause less damage to the right-of-way during construction than alternative 1 which utilizes large structures and correspondingly large foundations.

Disadvantages

R/W Width Required - This method requires less initial additional R/W than that needed for alternatives 1, 4, and 5 but more than that for alternatives 2 and 3.

Total Number of Structures - This method requires the greatest number of structures located on R/W within the Battlefield area.

B. Alternative 1

Tubular steel H-frame structures large enough to accept the two new circuits and the three existing circuits will be 118 feet

tall, 132 feet wide, and will weigh approximately 85,000 lbs. These new structures would be installed on a new 190 foot Right-of-Way purchased adjacent to the existing Right-of-Way and using nominal 1100 foot spans. Existing lines would be removed.

Impact

R/W Width Required (Additional)	Varies 75 ft. to 190 ft.
Length of Line	50,995 ft.
Existing R/W Width Cleared	Varies 150 ft. to 210 ft.
R/W Width to be Cleared (Additional)	Varies 75 ft. to 190 ft.
R/W Acres to be Cleared (Additional)	165.1
Estimated Cost	$5,906,299
Ratio of Cost to Base Proposal	1.57

Advantages

Reduced R/W Required - Approximately 20% less permanent R/W occupancy than the Base Proposal is required for the section of line through the Battlefield.

Reduced # of Structures - Approximately 20% fewer structures are required within the Battlefield area than for the base proposal.

Multiple R/W Use - This alternative takes maximum advantage of the multiple right-of-way land use principal in that the entire route is parallel to existing transmission lines, pipelines, and railroads. This produces the most acceptable compromise between economics and environmental impact.

Disadvantages

Non-Standard Method - GSU has never constructed this type of structure and may encounter unforeseen construction or operating problems.

Cost Premium - A 57% cost premium over the Base Proposal would be required.

No Spare Structures - No spare structure would be available. GSU would be required either to purchase a spare which would increase the cost premium or accept a reduced reliability without a spare.

R/W Clearing - Due to the need to maintain service to the area, a new R/W will be required. This will result initially in a much greater cleared "swath" through the Battlefield than the Base Proposal.

Horizon Impact - Due to the structure heights required, the structures would be visible on the horizon for a much greater distance.

Maintenance - Due to the imposition of five different circuits on one structure, maintenance will be made much more difficult, especially hot line maintenance, and may require that adjacent circuits be de-energized.

Construction Methods - Due to the extreme size--118 ft. tall and 132 ft. wide, and extreme weight--85,000 lbs., the construction of these structures will have a much more severe impact on the right-of-way than the base proposal. Heavier equipment will be needed

to haul and install the structures with greater scaring and rutting of the land. Much larger foundations will be required, 7 ft. diameter by 28 ft. deep, and these will require larger volumes of concrete, about 80 cu. yds. per structure. Access roads for concrete trucks and heavy equipment will be needed.

Reliability - Reliability of this method is considered unacceptable due to the possible loss of all five lines with a structure failure. Loss of all five lines could jeopardize the generator stability of both Big Cajun No. 2 and River Bend Station.

Delayed In-Service Date - Due to the engineering time, material lead time, and Right-of-Way purchase time involved, this method would cause at least 20 to 24 months delay in the in-service date.

Economic Loss - Material resources already committed to an overhead crossing of the Battlefield area would be an economic loss to whatever extent they could not be used on other projects.

C. Alternative 2

Install the two new 230kV lines underground using high pressure oil filled pipe type cable (HPOPT) for an underground traverse of the Battlefield area. These cables would be installed in a new 75 foot wide Right-of-Way purchased adjacent to the existing line's Right-of-Way.

Impact

R/W Width Required (Additional)	Varies 75 ft. to 96 ft.
Length of Crossing	50,995 ft.
Existing R/W Width Cleared	Varies 150 ft. to 210 ft.
R/W Width to be Cleared (Additional)	Varies 75 ft. to 96 ft.
R/W Acres to be Cleared (Additional)	99.1 ac.
Estimated Cost	$22,885,457
Ratio of Cost to Base Proposal	6.08

Advantages

Reduced R/W Required - Approximately 13% less permanent R/W occupancy than the Base Proposal is required.

Reduced Visible Impact - Due to the new lines being installed underground, there will be less visible impact on the horizon.

Multiple R/W Use - This alternative takes maximum advantage of the multiple right-of-way land use principal in that the entire route is parallel to existing transmission lines, pipelines, and railroads. This produces the most acceptable compromise between economics and environmental impact.

Disadvantages

Non-Standard Methods - GSU has never constructed this type of transmission line and may encounter unforeseen construction or operating problems.

Cost Premium - A 508% cost premium over the Base Proposal would be required.

Maintenance - This system will require the installation and maintenance of a spare cable due to the length of time required to locate and repair cable faults. Should a fault occur in more than one cable at the same time a lengthy outage can be expected. The cost of a spare conductor was not included in this estimate.

Exposure to Oil Spill - Over 400,000 gallons of oil is required to fill these cables at 200 psi pressure. Each individual cable contains over 80,000 gallons of oil. The exposure to oil spills in the event of a pipe rupture is considerable.

Construction Method - The installation of these cables will require the excavation of 150,500 cu. yds. of earth, sloping and grading of hills to reduce the steepness of the grades, and hauling in 75,000 cu. yds. of thermal backfill. Installation of large manholes every 3000 ft. for pulling in the cable will require additional excavation and the hauling in of large volumes of concrete. The potential impact on artifacts of historical significance which may be located in the path of construction is considerable.

Reliability - Reliability will be reduced somewhat due to the exposure to a lengthy outage in the event of a double cable fault.

Delayed In-Service Date - Due to the engineering time, material lead time, and longer construction time involved, this method would cause at least 18 to 20 months delay in the in-service date.

Economic Loss - Material resources already committed to an overhead crossing of the Battlefield area would be an economic loss to whatever extent they could not be used on other projects.

D. Alternative 3

Install the two new 230kV lines and the three existing 138kV and 69kV lines underground using HPOPT cable for an underground traverse of the Battlefield area. These cables would be installed in a new 75 foot Right-of-Way adjacent to the existing Right-of-Way and in the existing Right-of-Way.

Impact

R/W Width Required (Additional)	Varies 75 ft. to 96 ft.
Length of Crossing	50,995 ft.
Existing R/W Width Cleared	Varies 150 ft. to 210 ft.
R/W Width to be Cleared (Additional)	Varies 75 ft. to 96 ft.
R/W Acres to be Cleared (Additional)	99.1 ac.
Estimated Cost	$47,867,970
Ratio of Cost to Base Proposal	12.73

Advantages

Reduced R/W Required - Approximately 13% less permanent R/W occupancy than the Base Proposal is required.

Reduced Visible Impact - Due to all of the lines being installed underground, there will be a considerably less visible impact on the horizon.

Multiple R/W Use - This alternative takes maximum advantage of the multiple right-of-way land use principal in that the entire route is parallel to existing transmission lines, pipelines, and railroads. This produces the most acceptable compromise between economics and environmental impact.

Disadvantages

Non-Standard Method - GSU has never constructed this type of transmission line and may encounter unforeseen construction or operating problems.

Cost Premium - A 1,173% cost premium over the Base Proposal would be required.

Maintenance - This system will require the installation and maintenance of a spare cable due to the length of time required to locate and repair cable faults. Should a cable fault occur in more than one cable at the same time a lengthy outage can be expected. The cost of a spare cable was not included in this estimate.

Exposure to Oil Spill - Over 900,000 gallons of oil is required to fill these cables at 200 psi pressure. Each individual cable contains over 80,000 gallons of oil. The exposure to oil spills in the event of a pipe rupture is considerable.

Construction Method - The installation of these cables will require the excavation of 331,000 cu. yds. of earth, sloping and grading of hills to reduce the steepness of the grades, and hauling in 165,500 cu. yds. of thermal backfill. Installation of

large manholes every 3000 ft. along the Right-of-Way for pulling in the cable will require additional excavation and the hauling of large volumes of concrete along the Right-of-Way.

Underground Artifacts - The impact on artifacts of historical significance which may be located in the path of construction is tremendous.

Reliability - Reliability will be reduced somewhat due to the exposure to a lengthy outage in the event of a double cable fault.

Delayed In-Service Date - Due to the engineering time, material lead time, and longer construction time involved, this alternative will cause at least 18 to 20 months delay in the in-service date.

Economic Loss - Material resources already committed to an overhead crossing of the Battlefield area would be an economic loss to whatever extent they could not be used on other project.

E. Alternative 4

Reroute the two new 230kV transmission lines east of the Port Hudson Battlefield using conventional tubular steel pole H-frame structures of the same design as the Base Proposal. The rerouting of this line will require purchasing 10.7 miles of new right-of-way largely through developed suburban area.

Impact

R/W Width Required (Additional)	Varies 96 ft. to 113 ft.
Length of this Alternate Route	10.7 miles
Existing R/W Width Cleared	210 ft.
R/W Width to be Cleared (Additional)	Varies 96 ft. to 113 ft.
R/W Acres to be Cleared (Additional)	154.8 ac.
Est. Cost to Relocate East of Battlefield	$4,198,731
Ratio of Cost to Base Proposal	1.117

Advantages

Impact on Battlefield - Since the new lines are rerouted east of and completely outside of the Port Hudson Battlefield area the visual impact of these new lines on the area is zero. Visual impact would still be evident by existing lines and their structures.

Cost - This route would be the most economical of all the alternatives and is 11.7% more expensive than the Base Proposal.

Standard Method - This alternative utilizes standard construction methods and proven structure designs.

Disadvantages

Increased R/W Impact - Since the majority of this route will be completely new right-of-way, the right-of-way width and acreage will be greater for this alternative than any except the West route (alternative 5.)

Reliability - This alternative uses a longer route and therefore less reliable. This is based on the premise that a longer line has greater exposure to natural phenomenon (lightening, storm winds, etc.).

Economic Loss - Material resources already committed to an overhead crossing of the Battlefield area would be an economic loss to the extent they could not be used in the alternative route.

Delayed In-Service Date - The extensive surveying and right-of-way purchase time involved in this relocation would cause at least 20 to 22 months delay in the in-service date for these lines.

Multiple R/W Use - Only 28% of the route for this alternative will use existing highway, transmission line, pipeline and railroad rights-of-way.

F. Alternative 5

Reroute the two new 230kV transmission lines west of the Port Hudson Battlefield using conventional tubular steel pole H-frame structures of the same design as the Base Proposal. Install two new river crossings across the Mississippi River. The rerouting of this line will require purchasing 15.4 miles of new right-of-way most of which will be adjacent to existing Right-of-Way.

Impact

R/W Width Required (Additional)	Varies 68 ft. to 113 ft.
Length of this Alternate Route	15.4 miles
Existing R/W Width Cleared	Varies 150 ft. to 245 ft.

R/W Width to be Cleared (Additional)	Varies 68 ft. to 113 ft.
R/W Acres to be Cleared (Additional)	235.3 ac.
Est. Cost to Relocate West of Battlefield	$9,554,499
Ratio of Cost to Base Proposal	2.54

Advantages

Impact on Battlefield - Since the new lines are rerouted west of and completely outside of the Port Hudson Battlefield the impact of these lines on the Battlefield is reduced to zero. Visual impact would still be evident by existing lines and their structures.

Standard Method - This alternative utilizes standard construction methods and proven structure designs.

Disadvantages

Increased R/W Impact - Since the length of this route is much greater than any of the proposed alternatives it requires considerably more new and additional right-of-way than any of the alternatives and more than the Base Proposal. The installation of two additional river crossings across the Mississippi River will have a substantial impact on the waterway and will increase the air traffic obstructions in this area.

Cost - This route is extremely expensive because of its length and the two river crossings required. This alternative represents a 154% cost premium over the base proposal.

Reliability - This alternative uses a longer route and therefore less reliable. This is based on the premise that a longer line has greater exposure to natural phenomenon (lightening, storm winds, etc.). The loss of a River Crossing tower, though remote, should be considered to reduce reliability due to the long period of time the line would be out. Due to its cost, the purchase of a spare river crossing tower cannot be economically justified. Also a long construction time would be required for any repairs. These factors combine to reduce the reliability for lines on Mississippi River Crossing structures.

Multiple R/W Use - Only 64% of the route for this alternative will use existing highway, transmission line, pipeline and railroad rights-of-way.

Economic Loss - Material already committed to an overhead crossing of the Battlefield area would be an economic loss to the extent they could not be used in the alternative route.

Delayed In-Service Date - The extensive engineering time, material lead time, R/W procurement time, and extensive construction time for the river crossing would delay the in-service at least 24 to 26 months for these lines.

IV. Summary and Conclusions

In reviewing the environmental impact of each of the alternatives which have been evaluated, it can be seen that each alternative produces some unavoidable adverse affect on the environment (See Table 1). The mitigating action of burying pipe type cable down the right-of-way for an underground traverse of the Battlefield as proposed in Alternatives 4 and 5 seems particularly harmful to a historically sensitive area such as the Port Hudson Battlefield due to the amount of excavation required.

The installation of massive five circuit towers such as would be required for Alternative 1 would have a similar deleterious effect on the Battlefield. This method also has the disadvantage of creating an abandoned right-of-way adjacent to the new five circuit tower right-of-way. Initially this will nearly double the visual impact of the cleared right-of-way.

The East and West alternate routes to miss the Battlefield each require substantially more new right-of-way acreage than the proposed system. The East route traverses a rapidly developing residential area, and would probably create adverse public reaction. This route does not utilize the multiple R/W land use principle nearly as effectively as the base proposal. The West alternate route has the greatest right-of-way requirement of all alternatives. This route requires more than twice the acreage of new right-of-way than the base proposal. In addition, the double crossing of the Mississippi River represents an extreme impact on this waterway. Dr. Robert E. Noble, Ph.D., Environmental Consultant, performed an independent assessment of the

Proposed Route and Alternate Routes 1 and 2. His opinion (Exhibit B) supports this conclusion.

For the above reasons, it is felt the unavoidable adverse effects on the Port Hudson Battlefield as mitigated by commitments made by G.S.U. Co. to the State of Louisiana by letter to Mr. E. Bernard Carrier dated February 5, 1979, (Exhibit C) are less severe in nature and magnitude than those presented in alternatives which have been evaluated by this study.

TABLE 1
COST DESCRIPTION - ALTERNATIVE TRANSMISSION ROUTES CON'T

Environmental Costs	Units	MAGNITUDE PROPOSED	MAGNITUDE ALT. 1	MAGNITUDE ALT. 2	MAGNITUDE ALT. 3	MAGNITUDE ALT. 4	MAGNITUDE ALT. 5
8. Number of crest, ridge, or other high point crossings		0	0	0	0	0	1
9. Number of "long views" or transmission lines perpendicular to highways and waterways		0	0	0	0	0	0
10. Length of above transmission line in or through the following visually sensitive areas							
10.1 Natural Water Body Shoreline		0	0	0	0	0	0
10.2 Marshland		0	0	0	0	0	0
10.3 Wildlife Refuges		0	0	0	0	0	0
10.4 Parks		0	0	0	0	0	0
10.5 National and State Monuments		0	0	0	0	0	0
10.6 Scenic Areas		0	0	0	0	0	0
10.7 Recreation Areas		0	0	0	0	0	0
10.8 Historic Areas - Port Hudson Battlefield		1	1	1	1	0	0
10.9 Residential Areas		2	2	2	2	3	4
10.10 Heavily Timbered Areas	Miles	6.3	6.3	6.3	6.3	3.44	6.95
10.11 Shelter Belts		0	0	0	0	0	0
10.12 Steep Slopes		0	0	0	0	0	0
10.13 Wilderness Areas		0	0	0	0	0	0
10.14 (Other sensitive or critical areas, specify)	Cemeteries	3	3	3	3	1	1

1494 438

TABLE 1

COST DESCRIPTION - ALTERNATIVE TRANSMISSION ROUTES

ALTERNATIVES		A PROPOSED	B ALT. 1	C ALT. 2	D ALT. 3	E ALT. 4	F ALT. 5
Incremental Construction Costs		Base	$2,146,113	$19,125,271	$44,107,784	$438,545	$5,794,313
RBS Environmental Report Reference Section		10.9.1	N. A.	N. A.	N. A.	N. A.	N. A.
Environmental Costs	Units	MAGNITUDE	MAGNITUDE	MAGNITUDE	MAGNITUDE	MAGNITUDE	MAGNITUDE
1. Land Use (Rank alternative routes in terms of amount of conflict with present and planned land use)		Base	Same as Proposed	Same as Proposed	Same as Proposed	Greater	Same as Proposed
2. Property Values (Rank alternative routes in terms of total loss in property values)		Base	Slightly Less	Slightly Less	Slightly Less	Greater	Greater
3. Multiple Use (Rank alternative routes in terms of envisioned multiple use of land pre-empted by rights of way)		All of proposed route multiple right of way use-9.66 miles	Same as Proposed	Same as Proposed	Same as Proposed	2.9 miles 28%	9.8 miles 64%
4. Length of new 230KV line required	Miles	9.66 miles	9.66 miles	9.66 miles	9.66 miles	10.7 miles	15.4 miles
5. Number and length of new access and service roads required		NONE	2-1/2 miles	2-1/2 miles	2-1/2 miles	NONE	NONE
6. Number of road crossings		5	5	5	5	7	7
7. Number of major waterways crossings		1	1	1	1	1	4

1494 339