

McClellanville Power Supply Alternatives Evaluation

Central Electric Power Cooperative, Inc.

Submitted

Wednesday, June 22, 2005

Purpose:

As required by RUS, this Alternative Evaluation Study describes the need for improving power quality, reliability, and service to the McClellanville, SC area, and, describes and compares several conceptual alternatives by which the necessary improvements can be achieved.

Three general power supply alternatives were considered for this study: **1)** rebuilding the existing distribution system, **2)** constructing a McClellanville substation supplied with power via a newly constructed transmission line (four tap points were considered¹), and **3)** constructing a McClellanville substation with onsite power generation.

Project Rationale:

The McClellanville community is located in an area that has no existing transmission infrastructure. Since it is naturally surrounded by environmentally sensitive areas its location and size has allowed it to stay a relatively small electrical distribution load. Berkeley Electric Cooperative, a member of the Central Electric Coop System, has served the community from a very long distribution system with the longest circuits reaching almost 30 miles to the Santee River delta. Now through the years the community has begun to experience times of low voltage. The SCE&G Awendaw delivery point that serves the community routinely sustained low voltage until July 2003 when Berkeley Cooperative installed a third set of voltage regulators on their distribution system. After July 2003 low voltage occurred and continues to occur as momentary dips on the distribution system. **Table 1** provides a list of the most recent voltage dips on the distribution system. **Table 2** provides a list of the most recent outages that have impacted the distribution system.

¹ This study was prepared prior to the Macrocorridor Study, serving as the rationale for its preparation. During the preparation of the subsequent Macrocorridor Study, an additional tap point near Charity, SC was identified that offered two more routing possibilities. Although this tap point and its two routing alternatives are not considered in this Alternatives Evaluation, the inclusion of this information would not have altered the end comparison of the three general power supply alternatives.

| Table 1. Low Voltage Occurrence | | |
|--|-------------------------------------|---|
| Date | Description | Time |
| 5/24/2004 | Low voltage from SCE&G, Aw. M.P. | 12:13 A.M. |
| 5/25/2004 | Low voltage from SCE&G, Aw. M.P. | 1:52 P.M. |
| 5/26/2004 | Low voltage from SCE&G, Aw. M.P. | 1:59 P.M. 5:44 P.M. |
| 5/27/2004 | Low voltage from SCE&G, Aw. M.P. | 3:50 P.M. |
| 5/30/2004 | Low voltage from SCE&G, Aw. M.P. | 4:39 P.M. |
| 6/9/2004 | Low voltage from SCE&G, Aw. M.P. | 3:57 A.M. 7:11 A.M. |
| 6/10/2004 | Low voltage from SCE&G, Aw. M.P. | 2:59 A.M. |
| 6/14/2004 | Low voltage from SCE&G, Aw. M.P. | 4:35 A.M. |
| 6/15/2004 | Low voltage from SCE&G, Aw. M.P. | 8:22 A.M. 10:36 A.M. 10:55 A.M. |
| 6/20/2004 | Low voltage from SCE&G, Aw. M.P. | 9:21 P.M. |
| 6/21/2004 | Low voltage from SCE&G, Aw. M.P. | 7:42 A.M. |
| 5/13/2005 | Low voltage from SCE&G, Hamlin M.P. | Due to sympathetic voltage dips from SCE&G breaker operations on the same bus feeding Hamlin Ckts. #1,#2,. |

| Table 2. Outage Occurrences | | |
|------------------------------------|--|---|
| Date | Description | Outage |
| 8/28/2003 | Three(3) transmission structures down. Hamlin M.P./Aw. M.P. down. | Aw. M.P. – 4.5 hrs. Hamlin Ckts. #1,#2 – 5.5 hrs. Hamlin Ckt. #3 – 8.5 hrs |
| 11/19/2003 | Transmission breaker out. Aw. M.P. down. | ** .5 hrs |
| 12/2/2003 | Transmission breaker out. Aw. M.P. down. | ** 11.5 min. |
| 12/16/2003 | Transmission breaker operation. | Seconds |
| 12/18/2003 | Transmission breaker out. Aw. M.P. down. | ** 7 min. |
| 1/20/2004 | Angle pole transmission structure down. Hamlin M.P./Aw. M.P. down. | All load back on – 17 hrs. |
| 3/7/2004 | Transmission breaker operation. Aw. M.P. | Seconds |
| 3/15/2004 | Transmission breaker operation. Aw. M.P. | Seconds |
| 5/2/2004 | Transmission breaker operation. Aw. M.P. | 10:23 A.M.- Seconds 8:15 P.M. - <1 min. |

| Table 2. Outage Occurrences | | |
|---|---|--|
| Date | Description | Outage |
| 5/22/2004 | Transmission breaker out. Aw. M.P. down. | 1 hr. 10 min. |
| 6/23/2004 | Transmission breaker operation, Aw. M.P. | Seconds |
| 6/30/2004 | Transmission breaker operation, Aw. M.P. | 2 operations – Seconds |
| 7/2/2004 | Transmission breaker out, Aw. M.P. | ** 17 min. |
| 8/12/2004 | Transmission breaker operation, Hamlin M.P. | Seconds |
| | Transmission breaker out, Aw. M.P. | ** 12 min. |
| 8/14/2004 | Transmission breaker operations, Hamlin M.P. | * OCB 90012 – 43 operations! * OCB 90682 – 47 operations! |
| 8/15/2004 | Transmission out, Aw. M.P. | ** .75 hrs. |
| 9/21/2004 | Transmission breaker out, Aw. M.P. | ** 8 min. |
| 10/4/2004 | Transmission breaker out, Aw. M.P. | ** .5 hr. |
| 3/1/2005 | Transmission breaker operation, Aw. M. P. 1:4 | 1:48 P.M. – Seconds |
| | | 3:31 P.M. – Seconds |
| 3/8/2005 | Transmission out, two phases got together, Aw. M.P. | 3.5 hrs. (our load back on in 9.5 min. from our Hamlin Ckt.) |
| 3/27/2005 | Transmission breaker out, Aw. M.P. | 1.0 hr. (our load back on in 7 min. from our Hamlin Ckt.) |
| 4/2/2005 | Transmission breaker operations, Aw. M.P. | 18 operations from 1:22 P.M. to 5:21 P.M. |
| 4/18/2005 | Transmission breaker out, Aw.M.P. | ** 6 min. |
| <p>Notes: Aw. Awendaw M.P. Metering Point Ckt. Circuit</p> <p>* After consultation with SCE&G, it was discovered that they had changed settings on their OCB's (breakers) on 8/03/04 and 8/04/04 without coordinating with BEC. As a result their settings were too close and their OCB's no longer coordinated with our reclosers.</p> <p>** Please note that in many cases the short outage time duration upon loss of transmission at Aw. M.P. is very misleading. In these cases, our members are off only minutes due to our System Controllers switching our Awendaw M.P. load over to Hamlin Ckt. #3. SCE&G power may not be restored for hours.</p> | | |

Economic Power Supply Analysis:

An economic power supply analysis was performed by comparing what it would cost to upgrade the existing distribution system versus a transmission alternative. All scenarios were looked at over a 30 year timeframe (expected life of transmission facilities). Options for serving this new delivery point are limited by the lack of transmission infrastructure in the area. An on site generation analysis was also performed for comparison.

Table 3 presents an executive summary analysis of all possible service alternatives to the McClellanville area. A 3.5% load growth was assumed over the 30 year period. The capital cost of the installed facilities and the present value of the system loss cost were itemized separately. Maps and detailed capital and present value loss cost calculations are provided for each case (See **Attachments**).

Case #1 in this exhibit evaluates rebuilding the existing distribution system to serve the McClellanville area. A capital cost of \$400,000 was invested in rebuilding the distribution circuits from the SCE&G Hamlin delivery point. The system is operated over 30 years and the present value cost of system losses over this period is \$162,885,055. The total system cost over the lifetime is \$163,285,055. All attached models are compared with case #1 of rebuilding the existing system.

Case #2 (Route A) evaluates the construction of the McClellanville substation and 24 miles of 115 kV transmission through the national forest and tapped from near the 115 kV Jamestown delivery point. Some distribution construction is required. The total capital cost of this project is \$6,790,000. The system is operated over 30 years and the present value cost of system losses over this period is \$103,016,551. The total system cost over the lifetime is \$109,806,551.

Case #3 (Route A1) evaluates the construction of the McClellanville substation and 12 miles of 115 kV transmission through the national forest and tapped from a 230/115 kV step-down station. Some distribution construction is required. The total capital cost of this project including the step-down station is \$10,400,000. The system is operated over 30 years and the present value cost of system losses over this period is \$102,857,090. The total system cost over the lifetime is \$113,257,090.

Case #4 (Route B) evaluates the construction of the McClellanville substation and 16 miles of 115 kV transmission through the Santee Delta and tapped from near the 115 kV Belle Isle delivery point. Some distribution construction is required. The total capital cost of this project is \$7,000,000. The system is operated over 30 years and the present value cost of system losses over this period is \$102,910,243. The total system cost over the lifetime is \$109,910,243.

Case #5 (Route B2) evaluates the construction of the McClellanville substation and 16 miles of 115 kV transmission through the Santee Delta and tapped from near the 115 kV Belle Isle delivery point. The two miles crossing the Santee Delta would be underground. Some distribution construction is required. The total capital cost of this project is

\$16,500,000. The system is operated over 30 years and the present value cost of system losses over this period is \$103,274,413. The total system cost over the lifetime is \$119,774,413.

Case #6 (Route C) evaluates the construction of the McClellanville substation and 29 miles of 115 kV transmission through the national forest and tapped from near the Winyah Generating station. Part of this line will follow the Winyah to Charity 230 kV transmission line. Some distribution construction is required. The total capital cost of this project is \$8,590,000. The system is operated over 30 years and the present value cost of system losses over this period is \$103,082,993. The total system cost over the lifetime is \$111,672,993.

Case #7 (On Site Generation) evaluates the construction of the McClellanville substation with on site generation capable of serving up to 5 MW. The initial capital cost of this project is \$12,1000,000. The third generator is added in the second year of operation. The system is operated over 30 years and the present value cost of system over this period is \$162,339,269. The total system cost over the lifetime is \$174,439,269.

Cost Comparison

Based on Total Cost estimates (**Table 3**), construction of a new transmission line to service the McClellanville area is the most economical. Rebuilding the existing distribution system would cost 45% more than transmission line construction while construction of a substation with onsite power generation capabilities would cost 55% more than transmission line construction².

Conclusion

Based on economic analysis, providing transmission line service to a McClellanville substation is the most cost effective alternative for improving power quality, reliability, and service to the McClellanville, SC area.

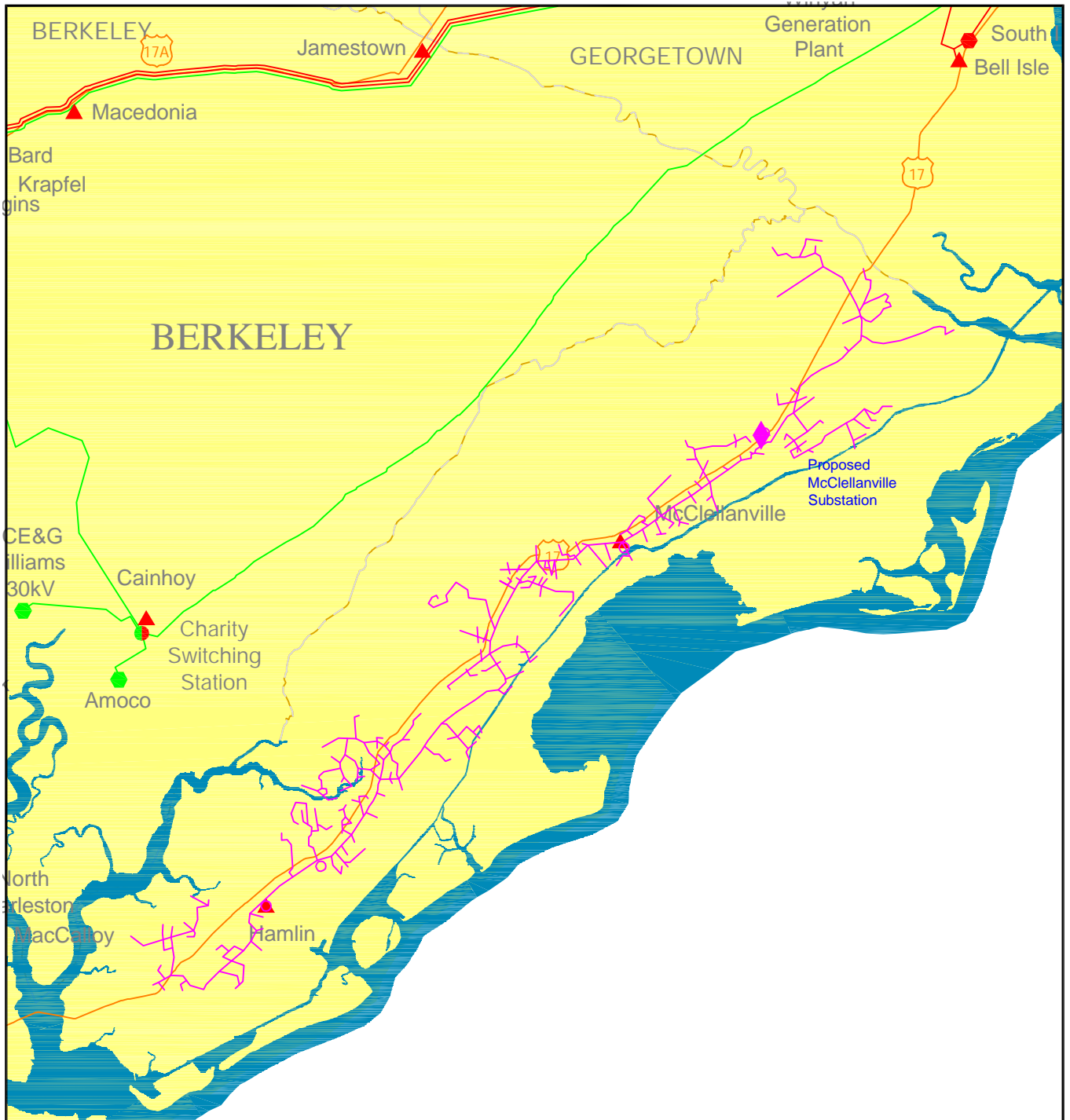
² Based on the average total cost of all transmission line alternatives considered in this study (approximately \$113,000,000)

Table 3. McClellanville Service Options Executive Summary

| Case # | Project Option | Capital Cost | Present Value Loss Cost | Total Cost |
|---------------------------|---|---------------------|--------------------------------|-------------------|
| Case #1 | Rebuild distribution system, no McClellanville substation | \$400,000 | \$163,285,055 | \$163,685,055 |
| Case # 2 (Route A) | McClellanville through 24 miles of transmission from Jamestown | \$6,790,000 | \$103,016,551 | \$109,806,551 |
| Case #3 (Route A1) | McClellanville through 12 miles of transmission from 230/115 kV stepdown station | \$10,400,000 | \$102,857,090 | \$113,257,090 |
| Case #4 (Route B) | McClellanville through 16 miles of transmission from Belle Isle. | \$7,000,000 | \$102,910,243 | \$109,910,243 |
| Case #5 (Route B2) | McClellanville through 16 miles of transmission from Belle Isle (2 miles underground) | \$16,500,000 | \$103,274,413 | \$119,774,413 |
| Case #6 (Route C) | McClellanville through 29 miles of transmission from Winyah Generation Station. | \$8,590,000 | \$103,082,993 | \$111,672,993 |
| Case #7 | On Site Generation to remove 5 MW of load from SCE&G initially | \$12,100,000 | \$162,339,269 | \$174,439,269 |

Attachments

Maps and detailed present value loss costs are provided for each case presented in the Alternatives Evaluation Study on the following pages. All models are compared with Case #1 - rebuilding the existing system.



Case #1 in this exhibit evaluates rebuilding the existing distribution system to serve the McClellanville area. A capital cost of \$400,000 was invested in rebuilding the distribution circuits from the SCE&G Hamlin delivery point. The system is operated over 30 years and the present value cost of system losses over this period is \$162,885,055. The total system cost over the lifetime is \$163,285,055. All attached models are compared with case #1 of rebuilding the existing system.

- 69 kV or Below Transmission Line
- 115 kV Transmission Line
- 230 kV Transmission Line
- - - Transmission Line not in Operation
- - - Proposed Transmission
- Transmission Interconnection (Indicating Utility)
- Central Electric Power Cooperative Substation
- Central Electric Power Cooperative Switching Station
- Santee Cooper Substation
- Santee Cooper Switching Station
- Combustion Turbine Generating Station
- Hydro Generating Station
- Nuclear Generating Station
- Steam Generating Station
- South Carolina Interstates and Highways

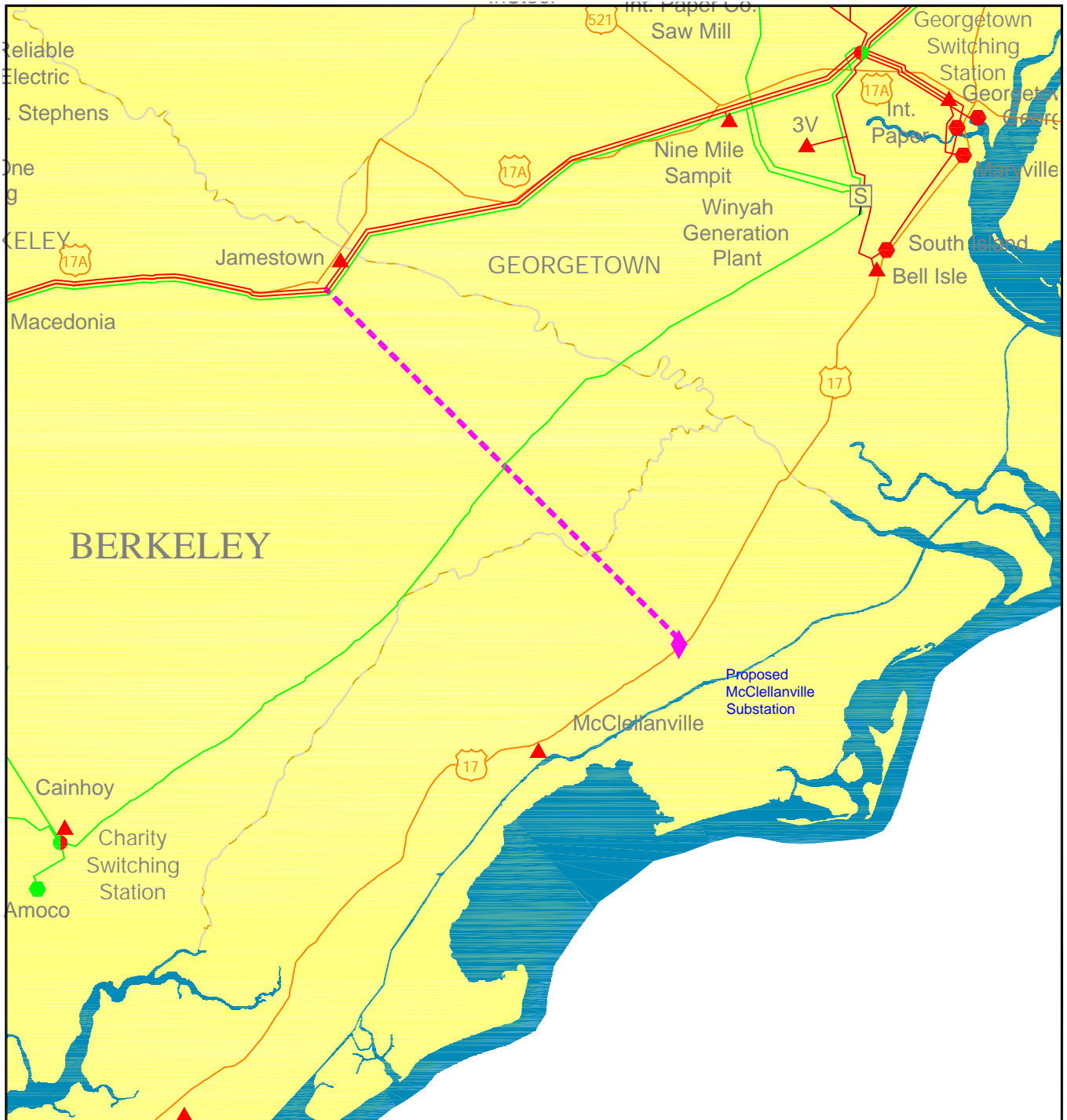


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Exhibit "A"
McClellanville Options
Case 1

01-08-05
DRAWN BY: J TINDAL
SCALE: 1 = 5 MILES



Case #2 (Route A) evaluates the construction of the McClellanville substation and 24 miles of 115 kV transmission through the national forest and tapped from near the 115 kV Jamestown delivery point. Some distribution construction is required. The total capital cost of this project is \$6,790,000. The system is operated over 30 years and the present value cost of system losses over this period is \$103,016,551. The total system cost over the lifetime is \$109,806,551.

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Exhibit "A"
McClellanville Options
Case 2

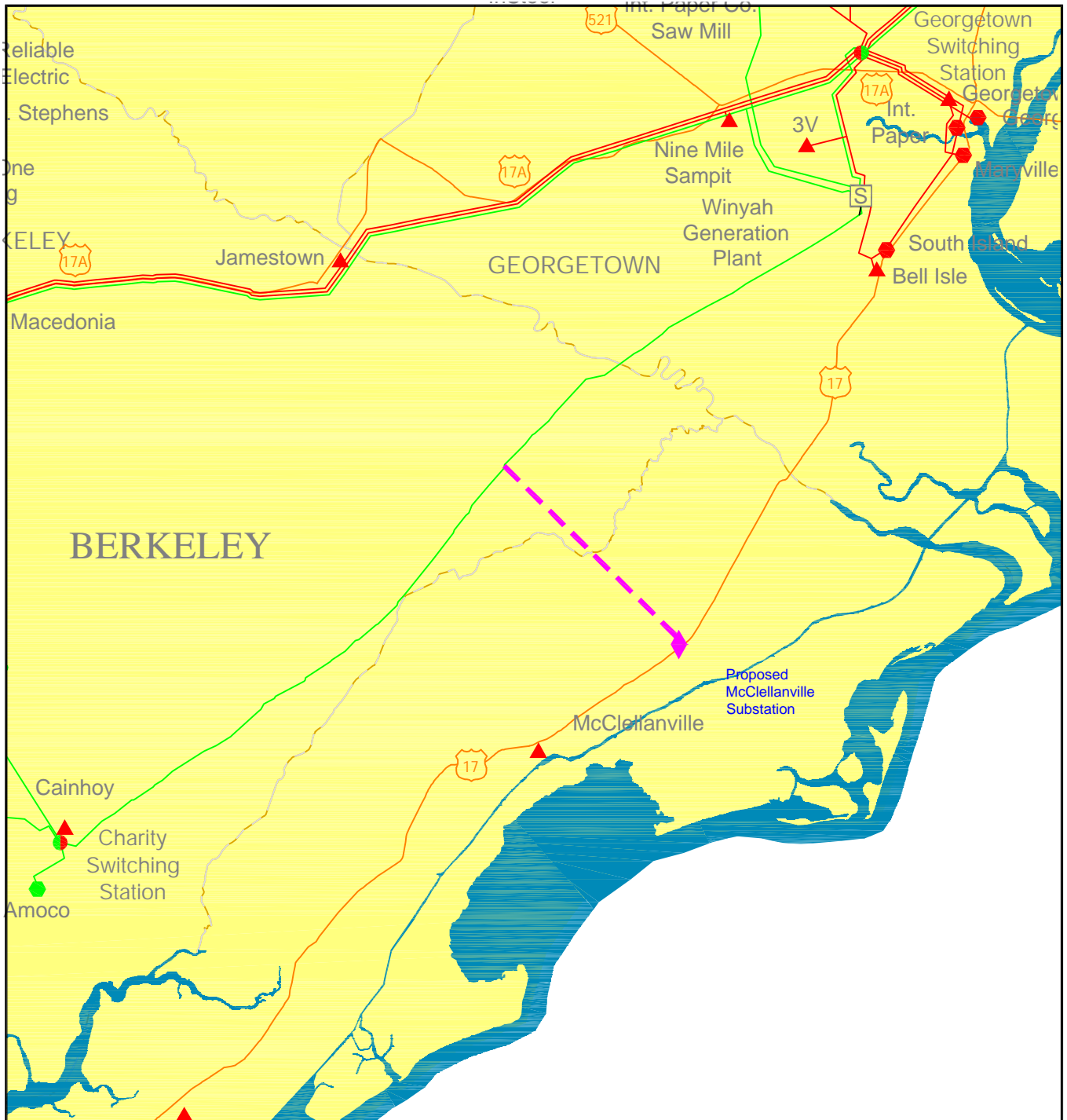
01-08-06
DRAWN BY: J TINDAL
SCALE: 1 = 5 MILES

Route A
 Station Na ADDING McClellanville through 24 miles of 115 kV transmission from Jamestown
 Member BERKELEY

discount rate % 6.00%
 load groth rate %/yr 3.5%
 Year 1 Loss delta kW 390.79
 Demand Chg. \$/kW/mc \$11.658 Year 1
 Eng Chg. mills/kWh 20 Year 1
 Dem Chg increase %/yr 3.0%
 Eng Chg increase %/yr 2.5%
 Load Factor of load 50.00%

RESULTS
 Sum of PV year 1
\$103,016,551

| year | average | total annual | | demand losses | | rgy losses | demand chg | eng chg | Loss cost | demand and energy cost | Generator Oper. Cost | Syst. Charge | Fix.Charges | additional capital cost | present value \$ |
|-----------|---------|--------------|-------|---------------|----------|------------|------------|------------|-----------|------------------------|----------------------|--------------|-------------|-------------------------|------------------|
| | kw | energy mWh | kw | mWh | \$/kW/mo | mills/kWh | \$ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | \$ |
| 1 | 16800 | 36,792 | 391 | 856 | \$11.66 | 20.0 | 71,786 | 3,086,093 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,157,879 |
| 2 | 17388 | 38,080 | 419 | 917 | \$12.01 | 20.5 | 79,114 | 3,286,121 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,174,750 |
| 3 | 17997 | 39,413 | 448 | 982 | \$12.37 | 21.0 | 87,191 | 3,499,130 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,191,813 |
| 4 | 18626 | 40,792 | 480 | 1,052 | \$12.74 | 21.5 | 96,093 | 3,725,962 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,209,070 |
| 5 | 19278 | 42,220 | 515 | 1,127 | \$13.12 | 22.1 | 105,903 | 3,967,515 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,226,529 |
| 6 | 19953 | 43,697 | 551 | 1,207 | \$13.51 | 22.6 | 116,717 | 4,224,746 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,244,193 |
| 7 | 20651 | 45,227 | 591 | 1,293 | \$13.92 | 23.2 | 128,634 | 4,498,673 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,262,069 |
| 8 | 21374 | 46,810 | 633 | 1,385 | \$14.34 | 23.8 | 141,770 | 4,790,382 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,280,163 |
| 9 | 22122 | 48,448 | 678 | 1,484 | \$14.77 | 24.4 | 156,247 | 5,101,028 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,298,479 |
| 10 | 22897 | 50,144 | 726 | 1,590 | \$15.21 | 25.0 | 172,203 | 5,431,841 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,317,025 |
| 11 | 23698 | 51,899 | 778 | 1,703 | \$15.67 | 25.6 | 189,789 | 5,784,133 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,335,807 |
| 12 | 24527 | 53,715 | 833 | 1,824 | \$16.14 | 26.2 | 209,173 | 6,159,299 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,354,831 |
| 13 | 25386 | 55,595 | 892 | 1,954 | \$16.62 | 26.9 | 230,537 | 6,558,826 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,374,105 |
| 14 | 26274 | 57,541 | 956 | 2,093 | \$17.12 | 27.6 | 254,084 | 6,984,298 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,393,636 |
| 15 | 27194 | 59,555 | 1,024 | 2,242 | \$17.63 | 28.3 | 280,038 | 7,437,401 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,413,431 |
| 16 | 28146 | 61,639 | 1,097 | 2,402 | \$18.16 | 29.0 | 308,643 | 7,919,932 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,433,497 |
| 17 | 29131 | 63,797 | 1,175 | 2,573 | \$18.71 | 29.7 | 340,173 | 8,433,804 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,453,843 |
| 18 | 30151 | 66,030 | 1,259 | 2,756 | \$19.27 | 30.4 | 374,924 | 8,981,054 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,474,478 |
| 19 | 31206 | 68,341 | 1,348 | 2,953 | \$19.85 | 31.2 | 413,228 | 9,563,854 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,495,409 |
| 20 | 32298 | 70,733 | 1,444 | 3,163 | \$20.44 | 32.0 | 455,446 | 10,184,515 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,516,646 |
| 21 | 33428 | 73,208 | 1,547 | 3,388 | \$21.06 | 32.8 | 501,980 | 10,845,498 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,538,198 |
| 22 | 34598 | 75,771 | 1,657 | 3,630 | \$21.69 | 33.6 | 553,271 | 11,549,428 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,560,074 |
| 23 | 35809 | 78,423 | 1,775 | 3,888 | \$22.34 | 34.4 | 609,805 | 12,299,096 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,582,286 |
| 24 | 37063 | 81,167 | 1,902 | 4,165 | \$23.01 | 35.3 | 672,119 | 13,097,477 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,604,843 |
| 25 | 38360 | 84,008 | 2,037 | 4,462 | \$23.70 | 36.2 | 740,803 | 13,947,742 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,627,755 |
| 26 | 39703 | 86,949 | 2,183 | 4,780 | \$24.41 | 37.1 | 816,509 | 14,853,263 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,651,035 |
| 27 | 41092 | 89,992 | 2,338 | 5,120 | \$25.14 | 38.0 | 899,955 | 15,817,637 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,674,695 |
| 28 | 42530 | 93,141 | 2,504 | 5,485 | \$25.90 | 39.0 | 991,934 | 16,844,693 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,698,745 |
| 29 | 44019 | 96,401 | 2,683 | 5,875 | \$26.67 | 39.9 | 1,093,318 | 17,938,508 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,723,199 |
| 30 | 45560 | 99,775 | 2,874 | 6,294 | \$27.47 | 40.9 | 1,205,068 | 19,103,426 | 0 | 0 | 0 | 0 | 0 | 0 | \$3,748,069 |
| sum of PV | | | | | | | | | | | | | | | \$103,016,551 |



Case #3 (Route A1) evaluates the construction of the McClellanville substation and 12 miles of 115 kV transmission through the national forest and tapped from a 230/115 kV stepdown station. Some distribution construction is required. The total capital cost of this project including the stepdown station is \$10,400,000. The system is operated over 30 years and the present value cost of system losses over this period is \$102,857,090. The total system cost over the lifetime is \$113,257,090.

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Exhibit "A"
McClellanville Options
Case 3

01-08-06
DRAWN BY: J TINDAL
SCALE: 1 = 5 MILES

Name NOT ADDING McClellanville
 Member BERKELEY
 discount rate % 6.00%
 load growth rate %/yr 3.5%
 Year 1 Loss kW 1,856.68
 Demand Chg. \$/kW/mr \$14,852 Year 1
 Eng Chg. mills/kWh 25.48 Year 1
 Dem Chg increase %/yr 3.0%
 Eng Chg increase %/yr 2.5%
 d. & Sys cont. Chg increase %/yr 0.3%
 ion & AS # 1&2 Charge /MW/YR \$12,604.590
 Operating cost inflation rate 0.00%
 Operating cost including fuel \$0.000
 Load Factor of load 50.00%
 Fixed Charge Rate 17.50%

| | | | | |
|---|--------------|------|---------------|----------------------|
| Executive summary: | | | | |
| NOT ADDING McClellanville | capital cost | plus | loss cost | |
| | \$400,000 | | \$162,885,055 | equals \$163,285,055 |
| Route A1 | capital cost | plus | loss cost | |
| ADDING McClellanville through 12 miles of | \$10,400,000 | | \$102,857,090 | equals \$113,257,090 |

| |
|----------------------|
| RESULTS |
| Sum of PV year 1 |
| \$162,885,055 |

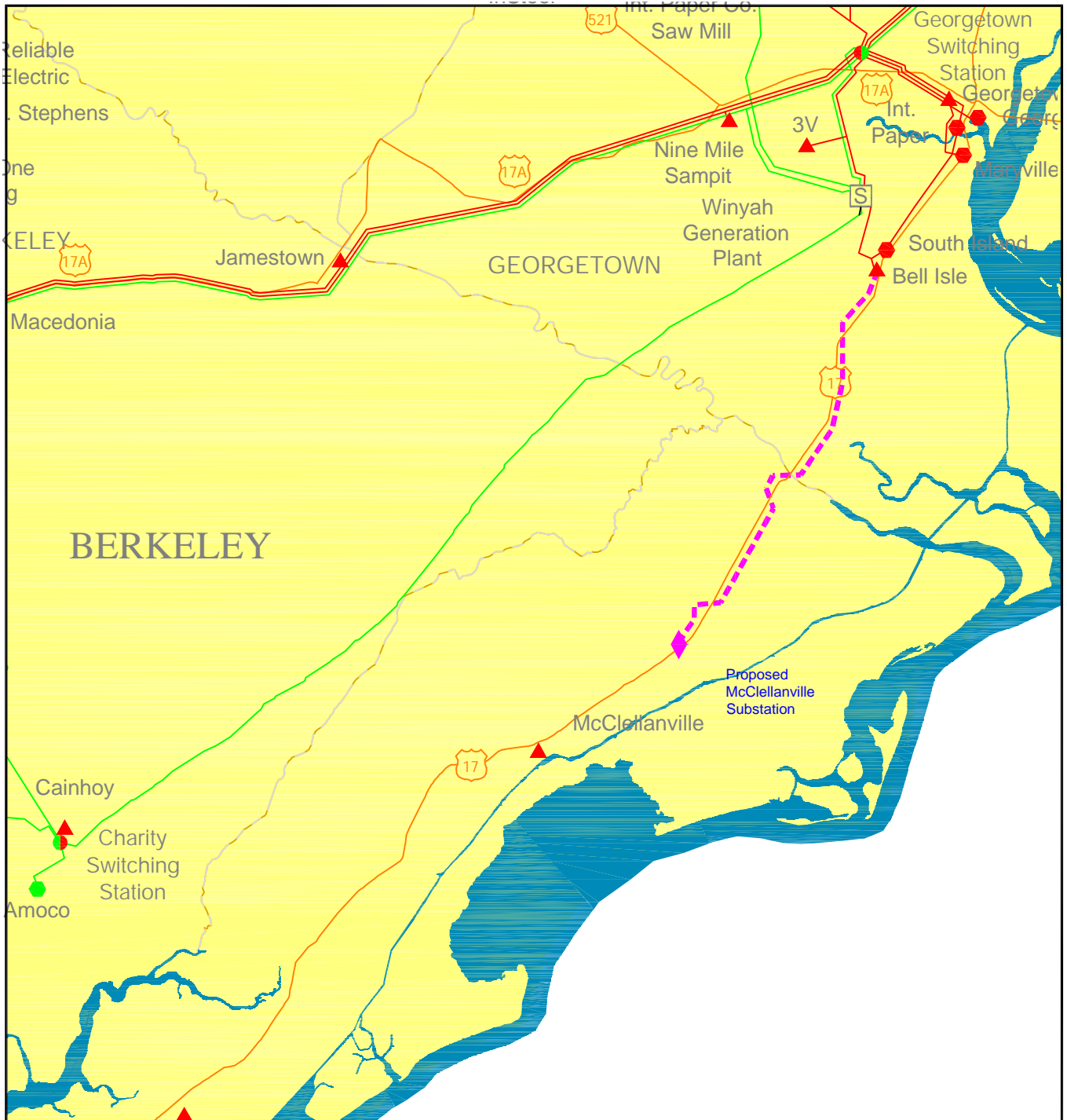
| year | average demand kw | total annual energy mWh | demand losses kw | rgy losses mWh | demand chg \$/kW/mo | eng chg mills/kWh | Loss cost \$ | demand and energy cost \$ | Generator Oper. Cost \$ | Syst. Charge \$ | Fix.Charges \$ | additional capital cost \$ | present value \$ |
|------|-------------------|-------------------------|------------------|----------------|---------------------|-------------------|--------------|---------------------------|-------------------------|-----------------|----------------|----------------------------|------------------|
| 1 | 18000 | 39,420 | 1,857 | 4,066 | \$14.85 | 25.5 | 434,510 | 4,212,454 | 0 | 163,860 | 70,000 | 0 | \$4,880,823 |
| 2 | 18630 | 40,800 | 1,989 | 4,356 | \$15.30 | 26.1 | 478,867 | 4,485,488 | 0 | 164,269 | 70,000 | 0 | \$4,904,363 |
| 3 | 19282 | 42,228 | 2,131 | 4,666 | \$15.76 | 26.8 | 527,754 | 4,776,240 | 0 | 164,680 | 70,000 | 0 | \$4,929,401 |
| 4 | 19957 | 43,706 | 2,282 | 4,998 | \$16.23 | 27.4 | 581,635 | 5,085,861 | 0 | 165,092 | 70,000 | 0 | \$4,955,926 |
| 5 | 20655 | 45,235 | 2,445 | 5,354 | \$16.72 | 28.1 | 641,019 | 5,415,576 | 0 | 165,504 | 70,000 | 0 | \$4,983,932 |
| 6 | 21378 | 46,819 | 2,619 | 5,736 | \$17.22 | 28.8 | 706,469 | 5,766,691 | 0 | 165,918 | 70,000 | 0 | \$5,013,414 |
| 7 | 22127 | 48,457 | 2,806 | 6,144 | \$17.73 | 29.5 | 778,605 | 6,140,596 | 0 | 166,333 | 70,000 | 0 | \$5,044,370 |
| 8 | 22901 | 50,153 | 3,005 | 6,582 | \$18.27 | 30.3 | 858,111 | 6,538,773 | 0 | 166,749 | 70,000 | 0 | \$5,076,802 |
| 9 | 23703 | 51,909 | 3,219 | 7,051 | \$18.81 | 31.0 | 945,739 | 6,962,798 | 0 | 167,166 | 70,000 | 0 | \$5,110,714 |
| 10 | 24532 | 53,725 | 3,449 | 7,553 | \$19.38 | 31.8 | 1,042,320 | 7,414,351 | 0 | 167,584 | 70,000 | 0 | \$5,146,116 |
| 11 | 25391 | 55,606 | 3,694 | 8,091 | \$19.96 | 32.6 | 1,148,769 | 7,895,222 | 0 | 168,003 | 70,000 | 0 | \$5,183,016 |
| 12 | 26279 | 57,552 | 3,958 | 8,667 | \$20.56 | 33.4 | 1,266,094 | 8,407,316 | 0 | 168,423 | 70,000 | 0 | \$5,221,429 |
| 13 | 27199 | 59,566 | 4,239 | 9,284 | \$21.18 | 34.3 | 1,395,407 | 8,952,662 | 0 | 168,844 | 70,000 | 0 | \$5,261,371 |
| 14 | 28151 | 61,651 | 4,541 | 9,946 | \$21.81 | 35.1 | 1,537,935 | 9,533,422 | 0 | 169,266 | 70,000 | 0 | \$5,302,861 |
| 15 | 29137 | 63,809 | 4,865 | 10,654 | \$22.46 | 36.0 | 1,695,028 | 10,151,898 | 0 | 169,689 | 70,000 | 0 | \$5,345,921 |
| 16 | 30156 | 66,042 | 5,211 | 11,413 | \$23.14 | 36.9 | 1,868,174 | 10,810,542 | 0 | 170,113 | 70,000 | 0 | \$5,390,576 |
| 17 | 31212 | 68,354 | 5,582 | 12,226 | \$23.83 | 37.8 | 2,059,016 | 11,511,966 | 0 | 170,538 | 70,000 | 0 | \$5,436,854 |
| 18 | 32304 | 70,746 | 5,980 | 13,096 | \$24.55 | 38.8 | 2,269,363 | 12,258,952 | 0 | 170,965 | 70,000 | 0 | \$5,484,785 |
| 19 | 33435 | 73,222 | 6,406 | 14,029 | \$25.28 | 39.7 | 2,501,209 | 13,054,461 | 0 | 171,392 | 70,000 | 0 | \$5,534,403 |
| 20 | 34605 | 75,785 | 6,862 | 15,028 | \$26.04 | 40.7 | 2,756,752 | 13,901,650 | 0 | 171,821 | 70,000 | 0 | \$5,585,743 |
| 21 | 35816 | 78,437 | 7,351 | 16,099 | \$26.82 | 41.8 | 3,038,416 | 14,803,879 | 0 | 172,250 | 70,000 | 0 | \$5,638,846 |
| 22 | 37070 | 81,183 | 7,875 | 17,246 | \$27.63 | 42.8 | 3,348,872 | 15,764,727 | 0 | 172,681 | 70,000 | 0 | \$5,693,754 |
| 23 | 38367 | 84,024 | 8,436 | 18,474 | \$28.46 | 43.9 | 3,691,064 | 16,788,008 | 0 | 173,113 | 70,000 | 0 | \$5,750,512 |
| 24 | 39710 | 86,965 | 9,036 | 19,790 | \$29.31 | 45.0 | 4,068,238 | 17,877,782 | 0 | 173,545 | 70,000 | 0 | \$5,809,167 |
| 25 | 41100 | 90,009 | 9,680 | 21,199 | \$30.19 | 46.1 | 4,483,973 | 19,038,375 | 0 | 173,979 | 70,000 | 0 | \$5,869,773 |
| 26 | 42538 | 93,159 | 10,369 | 22,709 | \$31.10 | 47.2 | 4,942,211 | 20,274,392 | 0 | 174,414 | 70,000 | 0 | \$5,932,382 |
| 27 | 44027 | 96,420 | 11,108 | 24,326 | \$32.03 | 48.4 | 5,447,301 | 21,590,742 | 0 | 174,850 | 70,000 | 0 | \$5,997,054 |
| 28 | 45568 | 99,794 | 11,899 | 26,059 | \$32.99 | 49.6 | 6,004,034 | 22,992,651 | 0 | 175,287 | 70,000 | 0 | \$6,063,848 |
| 29 | 47163 | 103,287 | 12,747 | 27,915 | \$33.98 | 50.9 | 6,617,695 | 24,485,685 | 0 | 175,725 | 70,000 | 0 | \$6,132,830 |
| 30 | 48814 | 106,902 | 13,655 | 29,903 | \$35.00 | 52.1 | 7,294,105 | 26,075,773 | 0 | 176,165 | 70,000 | 0 | \$6,204,067 |
| | | | | | | | sum of PV | | | | | | \$162,885,055 |

Route A1
 Station Na ADDING McClellanville through 12 miles of 115 kV transmission from Stepdown Station
 Member BERKELEY

discount rate % 6.00%
 load groth rate %/yr 3.5%
 Year 1 Loss delta kW 375.24
 Demand Chg. \$/kW/mr \$11.658 Year 1
 Eng Chg. mills/kWh 20 Year 1
 Dem Chg increase %/yr 3.0%
 Eng Chg increase %/yr 2.5%
 Load Factor of load 50.00%

RESULTS
 Sum of PV year 1
 \$102,857,090

| year | average demand kw | total annual energy mWh | demand losses kw | rgy losses mWh | demand chg \$/kW/mo | eng chg mills/kWh | Loss cost \$ | demand and energy cost \$ | Generator Oper. Cost \$ | Syst. Charge \$ | Fix.Charges \$ | additional capital cost \$ | present value \$ |
|------|-------------------|-------------------------|------------------|----------------|---------------------|-------------------|--------------|---------------------------|-------------------------|-----------------|----------------|----------------------------|------------------|
| 1 | 16800 | 36,792 | 375 | 822 | \$11.66 | 20.0 | 68,931 | 3,086,093 | 0 | 0 | 0 | 0 | \$3,155,023 |
| 2 | 17388 | 38,080 | 402 | 880 | \$12.01 | 20.5 | 75,967 | 3,286,121 | 0 | 0 | 0 | 0 | \$3,171,782 |
| 3 | 17997 | 39,413 | 431 | 943 | \$12.37 | 21.0 | 83,723 | 3,499,130 | 0 | 0 | 0 | 0 | \$3,188,726 |
| 4 | 18626 | 40,792 | 461 | 1,010 | \$12.74 | 21.5 | 92,271 | 3,725,962 | 0 | 0 | 0 | 0 | \$3,205,861 |
| 5 | 19278 | 42,220 | 494 | 1,082 | \$13.12 | 22.1 | 101,691 | 3,967,515 | 0 | 0 | 0 | 0 | \$3,223,192 |
| 6 | 19953 | 43,697 | 529 | 1,159 | \$13.51 | 22.6 | 112,074 | 4,224,746 | 0 | 0 | 0 | 0 | \$3,240,724 |
| 7 | 20651 | 45,227 | 567 | 1,242 | \$13.92 | 23.2 | 123,518 | 4,498,673 | 0 | 0 | 0 | 0 | \$3,258,462 |
| 8 | 21374 | 46,810 | 607 | 1,330 | \$14.34 | 23.8 | 136,131 | 4,790,382 | 0 | 0 | 0 | 0 | \$3,276,412 |
| 9 | 22122 | 48,448 | 651 | 1,425 | \$14.77 | 24.4 | 150,032 | 5,101,028 | 0 | 0 | 0 | 0 | \$3,294,580 |
| 10 | 22897 | 50,144 | 697 | 1,526 | \$15.21 | 25.0 | 165,354 | 5,431,841 | 0 | 0 | 0 | 0 | \$3,312,971 |
| 11 | 23698 | 51,899 | 747 | 1,635 | \$15.67 | 25.6 | 182,241 | 5,784,133 | 0 | 0 | 0 | 0 | \$3,331,592 |
| 12 | 24527 | 53,715 | 800 | 1,752 | \$16.14 | 26.2 | 200,853 | 6,159,299 | 0 | 0 | 0 | 0 | \$3,350,449 |
| 13 | 25386 | 55,595 | 857 | 1,876 | \$16.62 | 26.9 | 221,368 | 6,558,826 | 0 | 0 | 0 | 0 | \$3,369,548 |
| 14 | 26274 | 57,541 | 918 | 2,010 | \$17.12 | 27.6 | 243,978 | 6,984,298 | 0 | 0 | 0 | 0 | \$3,388,898 |
| 15 | 27194 | 59,555 | 983 | 2,153 | \$17.63 | 28.3 | 268,899 | 7,437,401 | 0 | 0 | 0 | 0 | \$3,408,504 |
| 16 | 28146 | 61,639 | 1,053 | 2,307 | \$18.16 | 29.0 | 296,367 | 7,919,932 | 0 | 0 | 0 | 0 | \$3,428,375 |
| 17 | 29131 | 63,797 | 1,128 | 2,471 | \$18.71 | 29.7 | 326,642 | 8,433,804 | 0 | 0 | 0 | 0 | \$3,448,517 |
| 18 | 30151 | 66,030 | 1,209 | 2,647 | \$19.27 | 30.4 | 360,012 | 8,981,054 | 0 | 0 | 0 | 0 | \$3,468,940 |
| 19 | 31206 | 68,341 | 1,295 | 2,835 | \$19.85 | 31.2 | 396,792 | 9,563,854 | 0 | 0 | 0 | 0 | \$3,489,650 |
| 20 | 32298 | 70,733 | 1,387 | 3,037 | \$20.44 | 32.0 | 437,331 | 10,184,515 | 0 | 0 | 0 | 0 | \$3,510,658 |
| 21 | 33428 | 73,208 | 1,486 | 3,254 | \$21.06 | 32.8 | 482,015 | 10,845,498 | 0 | 0 | 0 | 0 | \$3,531,972 |
| 22 | 34598 | 75,771 | 1,592 | 3,485 | \$21.69 | 33.6 | 531,265 | 11,549,428 | 0 | 0 | 0 | 0 | \$3,553,601 |
| 23 | 35809 | 78,423 | 1,705 | 3,734 | \$22.34 | 34.4 | 585,551 | 12,299,096 | 0 | 0 | 0 | 0 | \$3,575,555 |
| 24 | 37063 | 81,167 | 1,826 | 4,000 | \$23.01 | 35.3 | 645,386 | 13,097,477 | 0 | 0 | 0 | 0 | \$3,597,844 |
| 25 | 38360 | 84,008 | 1,956 | 4,284 | \$23.70 | 36.2 | 711,338 | 13,947,742 | 0 | 0 | 0 | 0 | \$3,620,478 |
| 26 | 39703 | 86,949 | 2,096 | 4,590 | \$24.41 | 37.1 | 784,033 | 14,853,263 | 0 | 0 | 0 | 0 | \$3,643,469 |
| 27 | 41092 | 89,992 | 2,245 | 4,916 | \$25.14 | 38.0 | 864,160 | 15,817,637 | 0 | 0 | 0 | 0 | \$3,666,826 |
| 28 | 42530 | 93,141 | 2,405 | 5,267 | \$25.90 | 39.0 | 952,481 | 16,844,693 | 0 | 0 | 0 | 0 | \$3,690,563 |
| 29 | 44019 | 96,401 | 2,576 | 5,642 | \$26.67 | 39.9 | 1,049,832 | 17,938,508 | 0 | 0 | 0 | 0 | \$3,714,692 |
| 30 | 45560 | 99,775 | 2,760 | 6,044 | \$27.47 | 40.9 | 1,157,138 | 19,103,426 | 0 | 0 | 0 | 0 | \$3,739,224 |
| | | | | | | | sum of PV | | | | | | \$102,857,090 |



Case #4 (Route B) evaluates the construction of the McClellanville substation and 16 miles of 115 kV transmission through the Santee Delta and tapped from near the 115 kV Belle Isle delivery point. Some distribution construction is required. The total capital cost of this project is \$7,000,000. The system is operated over 30 years and the present value cost of system losses over this period is \$102,910,243. The total system cost over the lifetime is \$109,910,243.

- 69 kV or Below Transmission Line
- 115 kV Transmission Line
- 230 kV Transmission Line
- - - Transmission Line not in Operation
- - - Proposed Transmission
- |—|— Transmission Interconnection (Indicating Utility)
- ▲ Central Electric Power Cooperative Substation
- ▲ Central Electric Power Cooperative Switching Station
- Santee Cooper Substation
- Santee Cooper Switching Station
- ☐ Combustion Turbine Generating Station
- ☐ Hydro Generating Station
- ☐ Nuclear Generating Station
- ☐ Steam Generating Station
- South Carolina Interstates and Highways

CENTRAL ELECTRIC POWER COOPERATIVE, INC.
 P.O. BOX 1455 / 121 GREYSTONE BLVD.
 COLUMBIA, SOUTH CAROLINA 29202
 (803) 779-4976

Exhibit "A"
 McClellanville Options
 Case 4

01-08-06
 DRAWN BY: J TINDAL
 SCALE: 1 = 5 MILES

| | | |
|--------|---------------------------------|-----------------|
| Name | NOT ADDING McClellanville | |
| Member | BERKELEY | |
| | discount rate % | 6.00% |
| | load growth rate %/yr | 3.5% |
| | Year 1 Loss kW | 1,856.68 |
| | Demand Chg. \$/kW/ | \$14.852 Year 1 |
| | Eng Chg. mills/kWh | 25.48 Year 1 |
| | Dem Chg increase %/yr | 3.0% |
| | Eng Chg increase %/yr | 2.5% |
| | . & Sys cont. Chg increase %/yr | 0.3% |
| | on & AS # 1&2 Charge /MW/YR | \$12,604.590 |
| | Operating cost inflation rate | 0.00% |
| | Operating cost including fuel | \$0.000 |
| | Load Factor of load | 50.00% |
| | Fixed Charge Rate | 17.50% |

| | | | | | | |
|--|--------------|-------------|------|----------------|----------------------|---------------|
| Executive summary: | | | | | | |
| NOT ADDING McClellanville | capital cost | \$400,000 | plus | operating cost | \$162,885,055 equals | \$163,285,055 |
| ROUTE B | capital cost | \$7,000,000 | plus | operating cost | \$102,910,243 equals | \$109,910,243 |
| ADDING McClellanville through 16 miles | | | | | | |

| |
|----------------------|
| RESULTS |
| Sum of PV year 1 |
| \$162,885,055 |

| year | average demand kw | total annual energy mWh | demand losses kw | rgy losses mWh | demand chg \$/kW/mo | eng chg mills/kWh | Loss cost \$ | demand and energy cost \$ | Generator Oper. Cost \$ | Syst. Charge | ix.Charges \$ | additional capital cost \$ | present value \$ |
|------|----------------------|----------------------------|---------------------|-------------------|------------------------|----------------------|-----------------|------------------------------|----------------------------|--------------|------------------|-------------------------------|------------------|
| 1 | 18000 | 39,420 | 1,857 | 4,066 | \$14.85 | 25.5 | 434,510 | 4,212,454 | 0 | 163,860 | 70,000 | 0 | \$4,880,823 |
| 2 | 18630 | 40,800 | 1,989 | 4,356 | \$15.30 | 26.1 | 478,867 | 4,485,488 | 0 | 164,269 | 70,000 | 0 | \$4,904,363 |
| 3 | 19282 | 42,228 | 2,131 | 4,666 | \$15.76 | 26.8 | 527,754 | 4,776,240 | 0 | 164,680 | 70,000 | 0 | \$4,929,401 |
| 4 | 19957 | 43,706 | 2,282 | 4,998 | \$16.23 | 27.4 | 581,635 | 5,085,861 | 0 | 165,092 | 70,000 | 0 | \$4,955,926 |
| 5 | 20655 | 45,235 | 2,445 | 5,354 | \$16.72 | 28.1 | 641,019 | 5,415,576 | 0 | 165,504 | 70,000 | 0 | \$4,983,932 |
| 6 | 21378 | 46,819 | 2,619 | 5,736 | \$17.22 | 28.8 | 706,469 | 5,766,691 | 0 | 165,918 | 70,000 | 0 | \$5,013,414 |
| 7 | 22127 | 48,457 | 2,806 | 6,144 | \$17.73 | 29.5 | 778,605 | 6,140,596 | 0 | 166,333 | 70,000 | 0 | \$5,044,370 |
| 8 | 22901 | 50,153 | 3,005 | 6,582 | \$18.27 | 30.3 | 858,111 | 6,538,773 | 0 | 166,749 | 70,000 | 0 | \$5,076,802 |
| 9 | 23703 | 51,909 | 3,219 | 7,051 | \$18.81 | 31.0 | 945,739 | 6,962,798 | 0 | 167,166 | 70,000 | 0 | \$5,110,714 |
| 10 | 24532 | 53,725 | 3,449 | 7,553 | \$19.38 | 31.8 | 1,042,320 | 7,414,351 | 0 | 167,584 | 70,000 | 0 | \$5,146,116 |
| 11 | 25391 | 55,606 | 3,694 | 8,091 | \$19.96 | 32.6 | 1,148,769 | 7,895,222 | 0 | 168,003 | 70,000 | 0 | \$5,183,016 |
| 12 | 26279 | 57,552 | 3,958 | 8,667 | \$20.56 | 33.4 | 1,266,094 | 8,407,316 | 0 | 168,423 | 70,000 | 0 | \$5,221,429 |
| 13 | 27199 | 59,566 | 4,239 | 9,284 | \$21.18 | 34.3 | 1,395,407 | 8,952,662 | 0 | 168,844 | 70,000 | 0 | \$5,261,371 |
| 14 | 28151 | 61,651 | 4,541 | 9,946 | \$21.81 | 35.1 | 1,537,935 | 9,533,422 | 0 | 169,266 | 70,000 | 0 | \$5,302,861 |
| 15 | 29137 | 63,809 | 4,865 | 10,654 | \$22.46 | 36.0 | 1,695,028 | 10,151,898 | 0 | 169,689 | 70,000 | 0 | \$5,345,921 |
| 16 | 30156 | 66,042 | 5,211 | 11,413 | \$23.14 | 36.9 | 1,868,174 | 10,810,542 | 0 | 170,113 | 70,000 | 0 | \$5,390,576 |
| 17 | 31212 | 68,354 | 5,582 | 12,226 | \$23.83 | 37.8 | 2,059,016 | 11,511,966 | 0 | 170,538 | 70,000 | 0 | \$5,436,854 |
| 18 | 32304 | 70,746 | 5,980 | 13,096 | \$24.55 | 38.8 | 2,269,363 | 12,258,952 | 0 | 170,965 | 70,000 | 0 | \$5,484,785 |
| 19 | 33435 | 73,222 | 6,406 | 14,029 | \$25.28 | 39.7 | 2,501,209 | 13,054,461 | 0 | 171,392 | 70,000 | 0 | \$5,534,403 |
| 20 | 34605 | 75,785 | 6,862 | 15,028 | \$26.04 | 40.7 | 2,756,752 | 13,901,650 | 0 | 171,821 | 70,000 | 0 | \$5,585,743 |
| 21 | 35816 | 78,437 | 7,351 | 16,099 | \$26.82 | 41.8 | 3,038,416 | 14,803,879 | 0 | 172,250 | 70,000 | 0 | \$5,638,846 |
| 22 | 37070 | 81,183 | 7,875 | 17,246 | \$27.63 | 42.8 | 3,348,872 | 15,764,727 | 0 | 172,681 | 70,000 | 0 | \$5,693,754 |
| 23 | 38367 | 84,024 | 8,436 | 18,474 | \$28.46 | 43.9 | 3,691,064 | 16,788,008 | 0 | 173,113 | 70,000 | 0 | \$5,750,512 |
| 24 | 39710 | 86,965 | 9,036 | 19,790 | \$29.31 | 45.0 | 4,068,238 | 17,877,782 | 0 | 173,545 | 70,000 | 0 | \$5,809,167 |
| 25 | 41100 | 90,009 | 9,680 | 21,199 | \$30.19 | 46.1 | 4,483,973 | 19,038,375 | 0 | 173,979 | 70,000 | 0 | \$5,869,773 |
| 26 | 42538 | 93,159 | 10,369 | 22,709 | \$31.10 | 47.2 | 4,942,211 | 20,274,392 | 0 | 174,414 | 70,000 | 0 | \$5,932,382 |
| 27 | 44027 | 96,420 | 11,108 | 24,326 | \$32.03 | 48.4 | 5,447,301 | 21,590,742 | 0 | 174,850 | 70,000 | 0 | \$5,997,054 |
| 28 | 45568 | 99,794 | 11,899 | 26,059 | \$32.99 | 49.6 | 6,004,034 | 22,992,651 | 0 | 175,287 | 70,000 | 0 | \$6,063,848 |
| 29 | 47163 | 103,287 | 12,747 | 27,915 | \$33.98 | 50.9 | 6,617,695 | 24,485,685 | 0 | 175,725 | 70,000 | 0 | \$6,132,830 |
| 30 | 48814 | 106,902 | 13,655 | 29,903 | \$35.00 | 52.1 | 7,294,105 | 26,075,773 | 0 | 176,165 | 70,000 | 0 | \$6,204,067 |
| | | | | | | | sum of PV | | | | | | \$162,885,055 |

ROUTE B

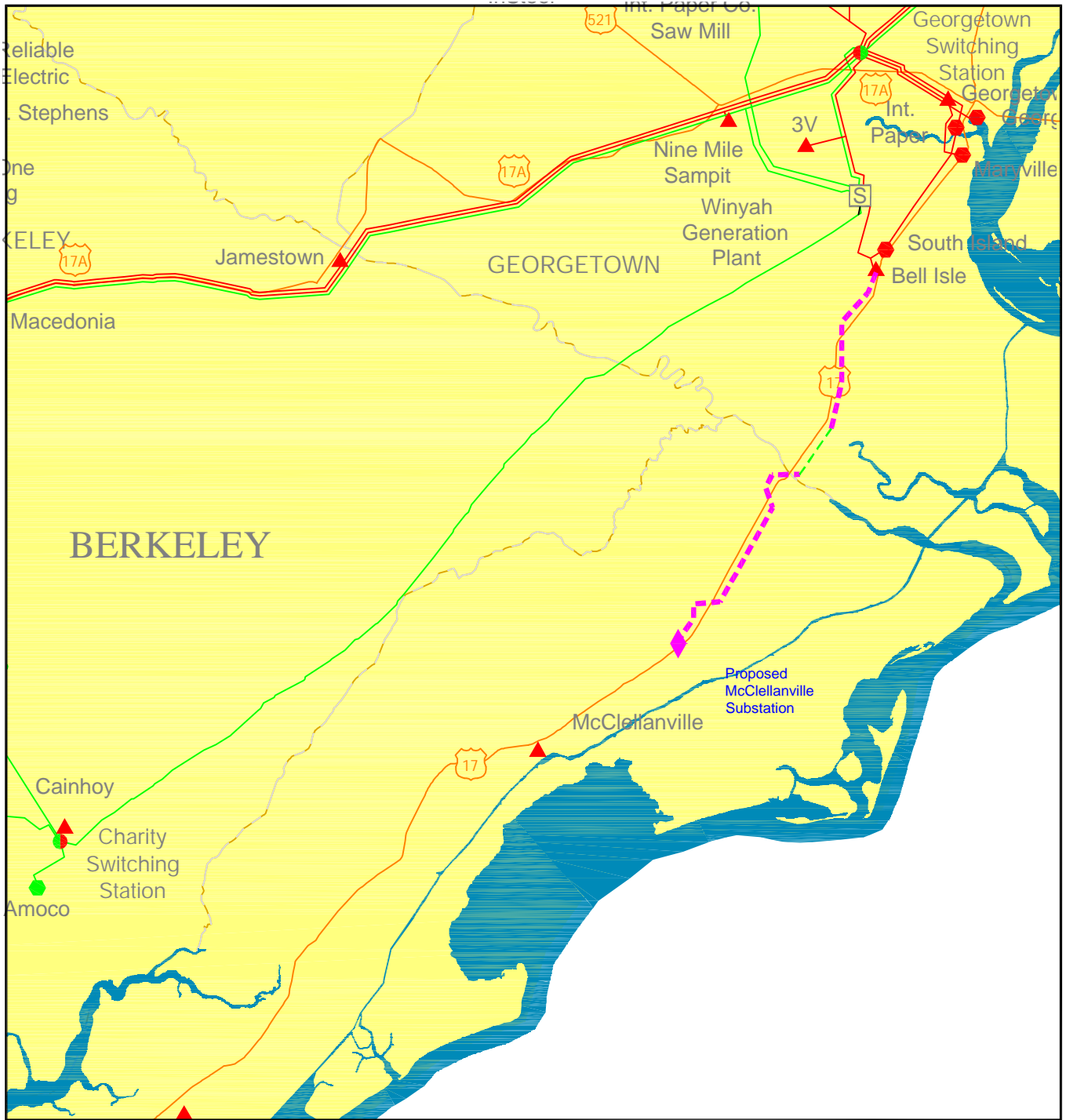
Station Na ADDING McClellanville through 16 miles of transmission from Belle Isle

Member BERKELEY

| | |
|-----------------------|-----------------|
| discount rate % | 6.00% |
| load groth rate %/yr | 3.5% |
| Year 1 Loss delta kW | 380.42 |
| Demand Chg. \$/kW/ | \$11.658 Year 1 |
| Eng Chg. mills/kWh | 20 Year 1 |
| Dem Chg increase %/yr | 3.0% |
| Eng Chg increase %/yr | 2.5% |
| Load Factor of load | 50.00% |

RESULTS
 Sum of PV year 1
\$102,910,243

| year | average | total annual | | demand losses rgy losses | | demand chg | eng chg | demand and Generator | | Syst. Charge ix.Charges | additional | | present value \$ |
|------|---------|--------------|-------|--------------------------|----------|------------|-----------|----------------------|------------|-------------------------|--------------|----|------------------|
| | demand | energy | kw | mWh | \$/kW/mo | mills/kWh | Loss cost | energy cost | Oper. Cost | | capital cost | | |
| | kw | mWh | kw | mWh | \$/kW/mo | mills/kWh | \$ | \$ | \$ | \$ | \$ | \$ | |
| 1 | 16800 | 36,792 | 380 | 833 | \$11.66 | 20.0 | 69,882 | 3,086,093 | 0 | 0 | 0 | 0 | \$3,155,975 |
| 2 | 17388 | 38,080 | 408 | 892 | \$12.01 | 20.5 | 77,016 | 3,286,121 | 0 | 0 | 0 | 0 | \$3,172,771 |
| 3 | 17997 | 39,413 | 437 | 956 | \$12.37 | 21.0 | 84,879 | 3,499,130 | 0 | 0 | 0 | 0 | \$3,189,755 |
| 4 | 18626 | 40,792 | 468 | 1,024 | \$12.74 | 21.5 | 93,545 | 3,725,962 | 0 | 0 | 0 | 0 | \$3,206,931 |
| 5 | 19278 | 42,220 | 501 | 1,097 | \$13.12 | 22.1 | 103,095 | 3,967,515 | 0 | 0 | 0 | 0 | \$3,224,304 |
| 6 | 19953 | 43,697 | 537 | 1,175 | \$13.51 | 22.6 | 113,622 | 4,224,746 | 0 | 0 | 0 | 0 | \$3,241,881 |
| 7 | 20651 | 45,227 | 575 | 1,259 | \$13.92 | 23.2 | 125,223 | 4,498,673 | 0 | 0 | 0 | 0 | \$3,259,665 |
| 8 | 21374 | 46,810 | 616 | 1,349 | \$14.34 | 23.8 | 138,010 | 4,790,382 | 0 | 0 | 0 | 0 | \$3,277,662 |
| 9 | 22122 | 48,448 | 660 | 1,445 | \$14.77 | 24.4 | 152,104 | 5,101,028 | 0 | 0 | 0 | 0 | \$3,295,880 |
| 10 | 22897 | 50,144 | 707 | 1,548 | \$15.21 | 25.0 | 167,637 | 5,431,841 | 0 | 0 | 0 | 0 | \$3,314,322 |
| 11 | 23698 | 51,899 | 757 | 1,658 | \$15.67 | 25.6 | 184,757 | 5,784,133 | 0 | 0 | 0 | 0 | \$3,332,997 |
| 12 | 24527 | 53,715 | 811 | 1,776 | \$16.14 | 26.2 | 203,626 | 6,159,299 | 0 | 0 | 0 | 0 | \$3,351,910 |
| 13 | 25386 | 55,595 | 869 | 1,902 | \$16.62 | 26.9 | 224,424 | 6,558,826 | 0 | 0 | 0 | 0 | \$3,371,067 |
| 14 | 26274 | 57,541 | 931 | 2,038 | \$17.12 | 27.6 | 247,347 | 6,984,298 | 0 | 0 | 0 | 0 | \$3,390,477 |
| 15 | 27194 | 59,555 | 997 | 2,183 | \$17.63 | 28.3 | 272,612 | 7,437,401 | 0 | 0 | 0 | 0 | \$3,410,146 |
| 16 | 28146 | 61,639 | 1,068 | 2,338 | \$18.16 | 29.0 | 300,459 | 7,919,932 | 0 | 0 | 0 | 0 | \$3,430,082 |
| 17 | 29131 | 63,797 | 1,144 | 2,505 | \$18.71 | 29.7 | 331,153 | 8,433,804 | 0 | 0 | 0 | 0 | \$3,450,292 |
| 18 | 30151 | 66,030 | 1,225 | 2,683 | \$19.27 | 30.4 | 364,983 | 8,981,054 | 0 | 0 | 0 | 0 | \$3,470,786 |
| 19 | 31206 | 68,341 | 1,313 | 2,875 | \$19.85 | 31.2 | 402,271 | 9,563,854 | 0 | 0 | 0 | 0 | \$3,491,570 |
| 20 | 32298 | 70,733 | 1,406 | 3,079 | \$20.44 | 32.0 | 443,370 | 10,184,515 | 0 | 0 | 0 | 0 | \$3,512,654 |
| 21 | 33428 | 73,208 | 1,506 | 3,299 | \$21.06 | 32.8 | 488,670 | 10,845,498 | 0 | 0 | 0 | 0 | \$3,534,047 |
| 22 | 34598 | 75,771 | 1,613 | 3,534 | \$21.69 | 33.6 | 538,601 | 11,549,428 | 0 | 0 | 0 | 0 | \$3,555,759 |
| 23 | 35809 | 78,423 | 1,728 | 3,785 | \$22.34 | 34.4 | 593,636 | 12,299,096 | 0 | 0 | 0 | 0 | \$3,577,799 |
| 24 | 37063 | 81,167 | 1,852 | 4,055 | \$23.01 | 35.3 | 654,297 | 13,097,477 | 0 | 0 | 0 | 0 | \$3,600,177 |
| 25 | 38360 | 84,008 | 1,983 | 4,344 | \$23.70 | 36.2 | 721,159 | 13,947,742 | 0 | 0 | 0 | 0 | \$3,622,904 |
| 26 | 39703 | 86,949 | 2,125 | 4,653 | \$24.41 | 37.1 | 794,858 | 14,853,263 | 0 | 0 | 0 | 0 | \$3,645,991 |
| 27 | 41092 | 89,992 | 2,276 | 4,984 | \$25.14 | 38.0 | 876,092 | 15,817,637 | 0 | 0 | 0 | 0 | \$3,669,449 |
| 28 | 42530 | 93,141 | 2,438 | 5,339 | \$25.90 | 39.0 | 965,632 | 16,844,693 | 0 | 0 | 0 | 0 | \$3,693,291 |
| 29 | 44019 | 96,401 | 2,612 | 5,720 | \$26.67 | 39.9 | 1,064,327 | 17,938,508 | 0 | 0 | 0 | 0 | \$3,717,527 |
| 30 | 45560 | 99,775 | 2,798 | 6,127 | \$27.47 | 40.9 | 1,173,115 | 19,103,426 | 0 | 0 | 0 | 0 | \$3,742,172 |
| | | | | | | | sum of PV | | | | | | \$102,910,243 |



Case #5 (Route B2) evaluates the construction of the McClellanville substation and 16 miles of 115 kV transmission through the Santee Delta and tapped from near the 115 kV Belle Isle delivery point. The two miles crossing the Santee Delta would be underground. Some distribution construction is required. The total capital cost of this project is \$16,500,000. The system is operated over 30 years and the present value cost of system losses over this period is \$103,274,413. The total system cost over the lifetime is \$119,774,413.

- 69 kV or Below Transmission Line
- 115 kV Transmission Line
- 230 kV Transmission Line
- - - - Transmission Line not in Operation
- - - - ◆ Proposed Transmission
- Transmission Interconnection (Indicating Utility)
- ▲ Central Electric Power Cooperative Substation
- ▲ Central Electric Power Cooperative Switching Station
- Santee Cooper Substation
- Santee Cooper Switching Station
- ☐ Combustion Turbine Generating Station
- ☐ Hydro Generating Station
- ☐ Nuclear Generating Station
- ☐ Steam Generating Station
- South Carolina Interstates and Highways



**CENTRAL
ELECTRIC
POWER**

COOPERATIVE, INC.
P.O. BOX 1455 / 121 GREYSTONE BLVD.
COLUMBIA, SOUTH CAROLINA 29202
(803) 779-4976

Exhibit "A"
McClellanville Options
Case 5

01-08-06
DRAWN BY: J TINDAL
SCALE: 1 = 5 MILES

| | |
|---------------------------------|---------------------------|
| Name | NOT ADDING McClellanville |
| Member | BERKELEY |
| discount rate % | 6.00% |
| load growth rate %/yr | 3.5% |
| Year 1 Loss kW | 1,856.68 |
| Demand Chg. \$/kW/ | \$14.852 Year 1 |
| Eng Chg. mills/kWh | 25.48 Year 1 |
| Dem Chg increase %/yr | 3.0% |
| Eng Chg increase %/yr | 2.5% |
| . & Sys cont. Chg increase %/yr | 0.3% |
| on & AS # 1&2 Charge /MW/YR | \$12,604.590 |
| Operating cost inflation rate | 0.00% |
| Operating cost including fuel | \$0.000 |
| Load Factor of load | 50.00% |
| Fixed Charge Rate | 17.50% |

| | | | | | | |
|--|--------------|--------------|------|----------------|----------------------|---------------|
| Executive summary: | | | | | | |
| NOT ADDING McClellanville | capital cost | \$400,000 | plus | operating cost | \$162,885,055 equals | \$163,285,055 |
| ROUTE B2 | capital cost | \$16,500,000 | plus | operating cost | \$103,274,413 equals | \$119,774,413 |
| ADDING McClellanville through 16 miles | | | | | | |

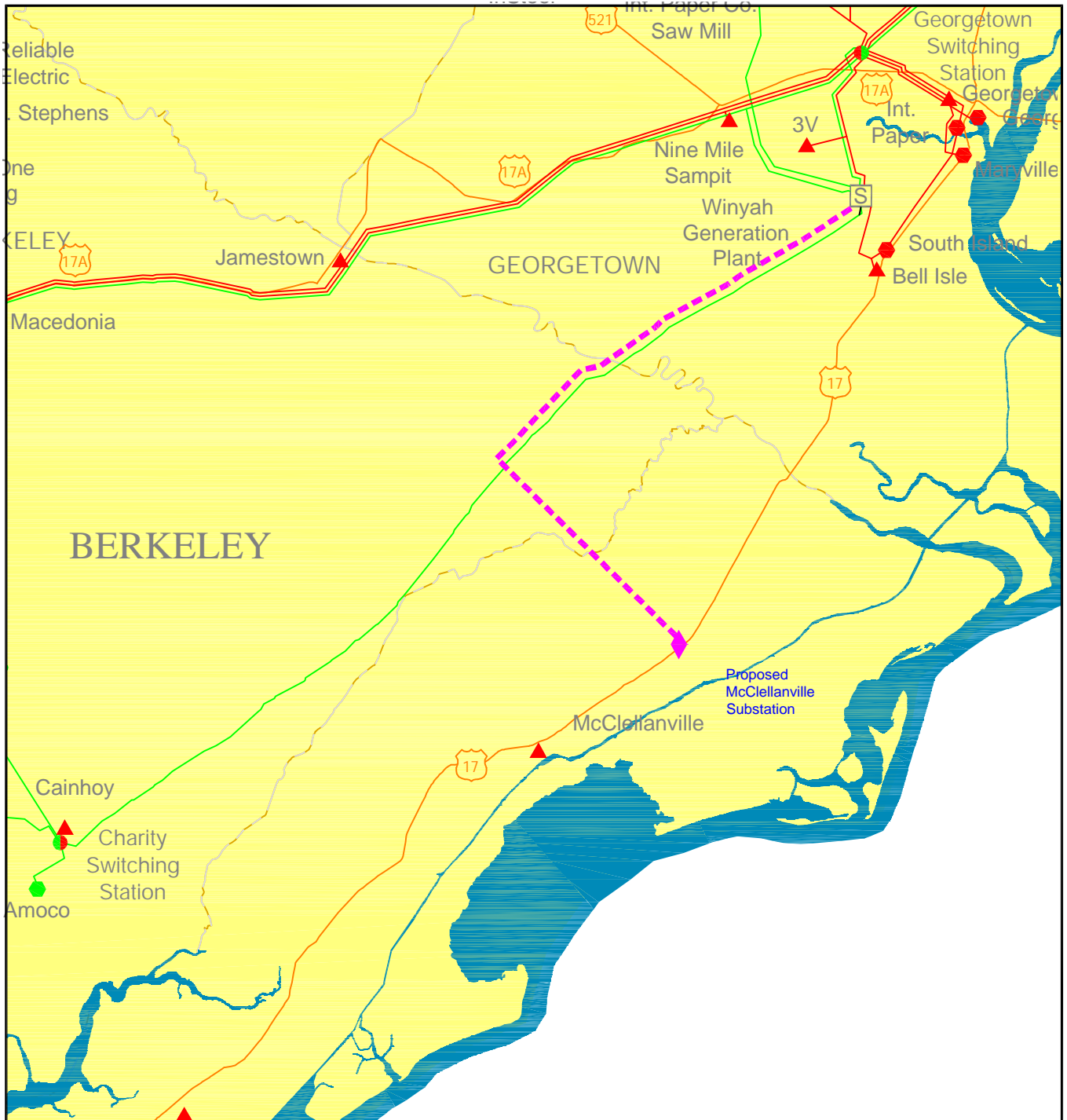
| |
|----------------------|
| RESULTS |
| Sum of PV year 1 |
| \$162,885,055 |

| year | average demand kw | total annual energy mWh | demand losses kw | rgy losses mWh | demand chg \$/kW/mo | eng chg mills/kWh | Loss cost \$ | demand and energy cost \$ | Generator Oper. Cost \$ | Syst. Charge ix. \$ | Charges \$ | additional capital cost \$ | present value \$ |
|------|----------------------|----------------------------|---------------------|-------------------|------------------------|----------------------|-----------------|------------------------------|----------------------------|------------------------|---------------|-------------------------------|------------------|
| 1 | 18000 | 39,420 | 1,857 | 4,066 | \$14.85 | 25.5 | 434,510 | 4,212,454 | 0 | 163,860 | 70,000 | 0 | \$4,880,823 |
| 2 | 18630 | 40,800 | 1,989 | 4,356 | \$15.30 | 26.1 | 478,867 | 4,485,488 | 0 | 164,269 | 70,000 | 0 | \$4,904,363 |
| 3 | 19282 | 42,228 | 2,131 | 4,666 | \$15.76 | 26.8 | 527,754 | 4,776,240 | 0 | 164,680 | 70,000 | 0 | \$4,929,401 |
| 4 | 19957 | 43,706 | 2,282 | 4,998 | \$16.23 | 27.4 | 581,635 | 5,085,861 | 0 | 165,092 | 70,000 | 0 | \$4,955,926 |
| 5 | 20655 | 45,235 | 2,445 | 5,354 | \$16.72 | 28.1 | 641,019 | 5,415,576 | 0 | 165,504 | 70,000 | 0 | \$4,983,932 |
| 6 | 21378 | 46,819 | 2,619 | 5,736 | \$17.22 | 28.8 | 706,469 | 5,766,691 | 0 | 165,918 | 70,000 | 0 | \$5,013,414 |
| 7 | 22127 | 48,457 | 2,806 | 6,144 | \$17.73 | 29.5 | 778,605 | 6,140,596 | 0 | 166,333 | 70,000 | 0 | \$5,044,370 |
| 8 | 22901 | 50,153 | 3,005 | 6,582 | \$18.27 | 30.3 | 858,111 | 6,538,773 | 0 | 166,749 | 70,000 | 0 | \$5,076,802 |
| 9 | 23703 | 51,909 | 3,219 | 7,051 | \$18.81 | 31.0 | 945,739 | 6,962,798 | 0 | 167,166 | 70,000 | 0 | \$5,110,714 |
| 10 | 24532 | 53,725 | 3,449 | 7,553 | \$19.38 | 31.8 | 1,042,320 | 7,414,351 | 0 | 167,584 | 70,000 | 0 | \$5,146,116 |
| 11 | 25391 | 55,606 | 3,694 | 8,091 | \$19.96 | 32.6 | 1,148,769 | 7,895,222 | 0 | 168,003 | 70,000 | 0 | \$5,183,016 |
| 12 | 26279 | 57,552 | 3,958 | 8,667 | \$20.56 | 33.4 | 1,266,094 | 8,407,316 | 0 | 168,423 | 70,000 | 0 | \$5,221,429 |
| 13 | 27199 | 59,566 | 4,239 | 9,284 | \$21.18 | 34.3 | 1,395,407 | 8,952,662 | 0 | 168,844 | 70,000 | 0 | \$5,261,371 |
| 14 | 28151 | 61,651 | 4,541 | 9,946 | \$21.81 | 35.1 | 1,537,935 | 9,533,422 | 0 | 169,266 | 70,000 | 0 | \$5,302,861 |
| 15 | 29137 | 63,809 | 4,865 | 10,654 | \$22.46 | 36.0 | 1,695,028 | 10,151,898 | 0 | 169,689 | 70,000 | 0 | \$5,345,921 |
| 16 | 30156 | 66,042 | 5,211 | 11,413 | \$23.14 | 36.9 | 1,868,174 | 10,810,542 | 0 | 170,113 | 70,000 | 0 | \$5,390,576 |
| 17 | 31212 | 68,354 | 5,582 | 12,226 | \$23.83 | 37.8 | 2,059,016 | 11,511,966 | 0 | 170,538 | 70,000 | 0 | \$5,436,854 |
| 18 | 32304 | 70,746 | 5,980 | 13,096 | \$24.55 | 38.8 | 2,269,363 | 12,258,952 | 0 | 170,965 | 70,000 | 0 | \$5,484,785 |
| 19 | 33435 | 73,222 | 6,406 | 14,029 | \$25.28 | 39.7 | 2,501,209 | 13,054,461 | 0 | 171,392 | 70,000 | 0 | \$5,534,403 |
| 20 | 34605 | 75,785 | 6,862 | 15,028 | \$26.04 | 40.7 | 2,756,752 | 13,901,650 | 0 | 171,821 | 70,000 | 0 | \$5,585,743 |
| 21 | 35816 | 78,437 | 7,351 | 16,099 | \$26.82 | 41.8 | 3,038,416 | 14,803,879 | 0 | 172,250 | 70,000 | 0 | \$5,638,846 |
| 22 | 37070 | 81,183 | 7,875 | 17,246 | \$27.63 | 42.8 | 3,348,872 | 15,764,727 | 0 | 172,681 | 70,000 | 0 | \$5,693,754 |
| 23 | 38367 | 84,024 | 8,436 | 18,474 | \$28.46 | 43.9 | 3,691,064 | 16,788,008 | 0 | 173,113 | 70,000 | 0 | \$5,750,512 |
| 24 | 39710 | 86,965 | 9,036 | 19,790 | \$29.31 | 45.0 | 4,068,238 | 17,877,782 | 0 | 173,545 | 70,000 | 0 | \$5,809,167 |
| 25 | 41100 | 90,009 | 9,680 | 21,199 | \$30.19 | 46.1 | 4,483,973 | 19,038,375 | 0 | 173,979 | 70,000 | 0 | \$5,869,773 |
| 26 | 42538 | 93,159 | 10,369 | 22,709 | \$31.10 | 47.2 | 4,942,211 | 20,274,392 | 0 | 174,414 | 70,000 | 0 | \$5,932,382 |
| 27 | 44027 | 96,420 | 11,108 | 24,326 | \$32.03 | 48.4 | 5,447,301 | 21,590,742 | 0 | 174,850 | 70,000 | 0 | \$5,997,054 |
| 28 | 45568 | 99,794 | 11,899 | 26,059 | \$32.99 | 49.6 | 6,004,034 | 22,992,651 | 0 | 175,287 | 70,000 | 0 | \$6,063,848 |
| 29 | 47163 | 103,287 | 12,747 | 27,915 | \$33.98 | 50.9 | 6,617,695 | 24,485,685 | 0 | 175,725 | 70,000 | 0 | \$6,132,830 |
| 30 | 48814 | 106,902 | 13,655 | 29,903 | \$35.00 | 52.1 | 7,294,105 | 26,075,773 | 0 | 176,165 | 70,000 | 0 | \$6,204,067 |
| | | | | | | | sum of PV | | | | | | \$162,885,055 |

ROUTE B2
 Station Na ADDING McClellanville through 16 miles of transmission from Belle Isle
 Member BERKELEY
 discount rate % 6.00%
 load groth rate %/yr 3.5%
 Year 1 Loss delta kW 415.92
 Demand Chg. \$/kW/ \$11.658 Year 1
 Eng Chg. mills/kWh 20 Year 1
 Dem Chg increase %/yr 3.0%
 Eng Chg increase %/yr 2.5%
 Load Factor of load 50.00%

RESULTS
 Sum of PV year 1
 \$103,274,413

| year | average demand kw | total annual energy mWh | demand losses kw | rgy losses mWh | demand chg \$/kW/mo | eng chg mills/kWh | Loss cost \$ | demand and energy cost \$ | Generator Oper. Cost \$ | Syst. Charge ix. | Charges \$ | additional capital cost \$ | present value \$ |
|------|-------------------|-------------------------|------------------|----------------|---------------------|-------------------|--------------|---------------------------|-------------------------|------------------|------------|----------------------------|------------------|
| 1 | 16800 | 36,792 | 416 | 911 | \$11.66 | 20.0 | 76,403 | 3,086,093 | 0 | 0 | 0 | 0 | \$3,162,496 |
| 2 | 17388 | 38,080 | 446 | 976 | \$12.01 | 20.5 | 84,203 | 3,286,121 | 0 | 0 | 0 | 0 | \$3,179,551 |
| 3 | 17997 | 39,413 | 477 | 1,045 | \$12.37 | 21.0 | 92,799 | 3,499,130 | 0 | 0 | 0 | 0 | \$3,196,804 |
| 4 | 18626 | 40,792 | 511 | 1,120 | \$12.74 | 21.5 | 102,273 | 3,725,962 | 0 | 0 | 0 | 0 | \$3,214,260 |
| 5 | 19278 | 42,220 | 548 | 1,199 | \$13.12 | 22.1 | 112,715 | 3,967,515 | 0 | 0 | 0 | 0 | \$3,231,924 |
| 6 | 19953 | 43,697 | 587 | 1,285 | \$13.51 | 22.6 | 124,224 | 4,224,746 | 0 | 0 | 0 | 0 | \$3,249,803 |
| 7 | 20651 | 45,227 | 628 | 1,376 | \$13.92 | 23.2 | 136,908 | 4,498,673 | 0 | 0 | 0 | 0 | \$3,267,902 |
| 8 | 21374 | 46,810 | 673 | 1,474 | \$14.34 | 23.8 | 150,888 | 4,790,382 | 0 | 0 | 0 | 0 | \$3,286,227 |
| 9 | 22122 | 48,448 | 721 | 1,579 | \$14.77 | 24.4 | 166,296 | 5,101,028 | 0 | 0 | 0 | 0 | \$3,304,784 |
| 10 | 22897 | 50,144 | 773 | 1,692 | \$15.21 | 25.0 | 183,279 | 5,431,841 | 0 | 0 | 0 | 0 | \$3,323,581 |
| 11 | 23698 | 51,899 | 828 | 1,812 | \$15.67 | 25.6 | 201,996 | 5,784,133 | 0 | 0 | 0 | 0 | \$3,342,623 |
| 12 | 24527 | 53,715 | 887 | 1,942 | \$16.14 | 26.2 | 222,627 | 6,159,299 | 0 | 0 | 0 | 0 | \$3,361,919 |
| 13 | 25386 | 55,595 | 950 | 2,080 | \$16.62 | 26.9 | 245,365 | 6,558,826 | 0 | 0 | 0 | 0 | \$3,381,474 |
| 14 | 26274 | 57,541 | 1,017 | 2,228 | \$17.12 | 27.6 | 270,426 | 6,984,298 | 0 | 0 | 0 | 0 | \$3,401,298 |
| 15 | 27194 | 59,555 | 1,090 | 2,387 | \$17.63 | 28.3 | 298,049 | 7,437,401 | 0 | 0 | 0 | 0 | \$3,421,397 |
| 16 | 28146 | 61,639 | 1,167 | 2,557 | \$18.16 | 29.0 | 328,495 | 7,919,932 | 0 | 0 | 0 | 0 | \$3,441,780 |
| 17 | 29131 | 63,797 | 1,251 | 2,739 | \$18.71 | 29.7 | 362,052 | 8,433,804 | 0 | 0 | 0 | 0 | \$3,462,456 |
| 18 | 30151 | 66,030 | 1,340 | 2,934 | \$19.27 | 30.4 | 399,039 | 8,981,054 | 0 | 0 | 0 | 0 | \$3,483,433 |
| 19 | 31206 | 68,341 | 1,435 | 3,143 | \$19.85 | 31.2 | 439,806 | 9,563,854 | 0 | 0 | 0 | 0 | \$3,504,720 |
| 20 | 32298 | 70,733 | 1,537 | 3,367 | \$20.44 | 32.0 | 484,740 | 10,184,515 | 0 | 0 | 0 | 0 | \$3,526,327 |
| 21 | 33428 | 73,208 | 1,647 | 3,606 | \$21.06 | 32.8 | 534,267 | 10,845,498 | 0 | 0 | 0 | 0 | \$3,548,265 |
| 22 | 34598 | 75,771 | 1,764 | 3,863 | \$21.69 | 33.6 | 588,857 | 11,549,428 | 0 | 0 | 0 | 0 | \$3,570,542 |
| 23 | 35809 | 78,423 | 1,890 | 4,138 | \$22.34 | 34.4 | 649,027 | 12,299,096 | 0 | 0 | 0 | 0 | \$3,593,170 |
| 24 | 37063 | 81,167 | 2,024 | 4,433 | \$23.01 | 35.3 | 715,348 | 13,097,477 | 0 | 0 | 0 | 0 | \$3,616,160 |
| 25 | 38360 | 84,008 | 2,168 | 4,749 | \$23.70 | 36.2 | 788,450 | 13,947,742 | 0 | 0 | 0 | 0 | \$3,639,523 |
| 26 | 39703 | 86,949 | 2,323 | 5,087 | \$24.41 | 37.1 | 869,026 | 14,853,263 | 0 | 0 | 0 | 0 | \$3,663,272 |
| 27 | 41092 | 89,992 | 2,488 | 5,449 | \$25.14 | 38.0 | 957,839 | 15,817,637 | 0 | 0 | 0 | 0 | \$3,687,418 |
| 28 | 42530 | 93,141 | 2,666 | 5,838 | \$25.90 | 39.0 | 1,055,734 | 16,844,693 | 0 | 0 | 0 | 0 | \$3,711,975 |
| 29 | 44019 | 96,401 | 2,855 | 6,253 | \$26.67 | 39.9 | 1,163,638 | 17,938,508 | 0 | 0 | 0 | 0 | \$3,736,956 |
| 30 | 45560 | 99,775 | 3,059 | 6,699 | \$27.47 | 40.9 | 1,282,577 | 19,103,426 | 0 | 0 | 0 | 0 | \$3,762,374 |
| | | | | | | | sum of PV | | | | | | \$103,274,413 |



Case #6 (Route C) evaluates the construction of the McClellanville substation and 29 miles of 115 kV transmission through the national forest and tapped from near the Winyah Generating station. Part of this line will follow the Winyah to Charity 230 kV transmission line. Some distribution construction is required. The total capital cost of this project is \$8,590,000. The system is operated over 30 years and the present value cost of system losses over this period is \$103,082,993. The total system cost over the lifetime is \$111,672,993.

- 69 kV or Below Transmission Line
- 115 kV Transmission Line
- 230 kV Transmission Line
- - - Transmission Line not in Operation
- - - Proposed Transmission
- Transmission Interconnection (Indicating Utility)
- ▲ Central Electric Power Cooperative Substation
- ▲ Central Electric Power Cooperative Switching Station
- Santee Cooper Substation
- Santee Cooper Switching Station
- Combustion Turbine Generating Station
- Hydro Generating Station
- N Nuclear Generating Station
- S Steam Generating Station
- South Carolina Interstates and Highways

CENTRAL ELECTRIC POWER COOPERATIVE, INC.
 P.O. BOX 1455 / 121 GREYSTONE BLVD.
 COLUMBIA, SOUTH CAROLINA 29202
 (803) 779-4976

Exhibit "A"
 McClellanville Options
 Case 6

01-08-06
 DRAWN BY: J TINDAL
 SCALE: 1 = 5 MILES

Name NOT ADDING McClellanville
 Member BERKELEY
 discount rate % 6.00%
 load growth rate %/yr 3.5%
 Year 1 Loss kW 1,856.68
 Demand Chg. \$/kW/mo \$14.852 Year 1
 Eng Chg. mills/kWh 25.48 Year 1
 Dem Chg increase %/yr 3.0%
 Eng Chg increase %/yr 2.5%
 med. & Sys cont. Chg increase %/yr 0.3%
 ssion & AS # 1&2 Charge /MW/YR \$12,604.590
 Operating cost inflation rate 0.00%
 Operating cost including fuel \$0.000
 Load Factor of load 50.00%
 Fixed Charge Rate 17.50%

| | | | | |
|---|------------------|----------------------|--|---------------|
| Executive summary: | | | | |
| NOT ADDING McClellanville | capital cost | loss cost | | |
| | \$400,000 plus | \$162,885,055 equals | | \$163,285,055 |
| Route C | capital cost | loss cost | | |
| ADDING McClellanville through 29 miles of | \$8,590,000 plus | \$103,082,993 equals | | \$111,672,993 |

| |
|----------------------|
| RESULTS |
| Sum of PV year 1 |
| \$162,885,055 |

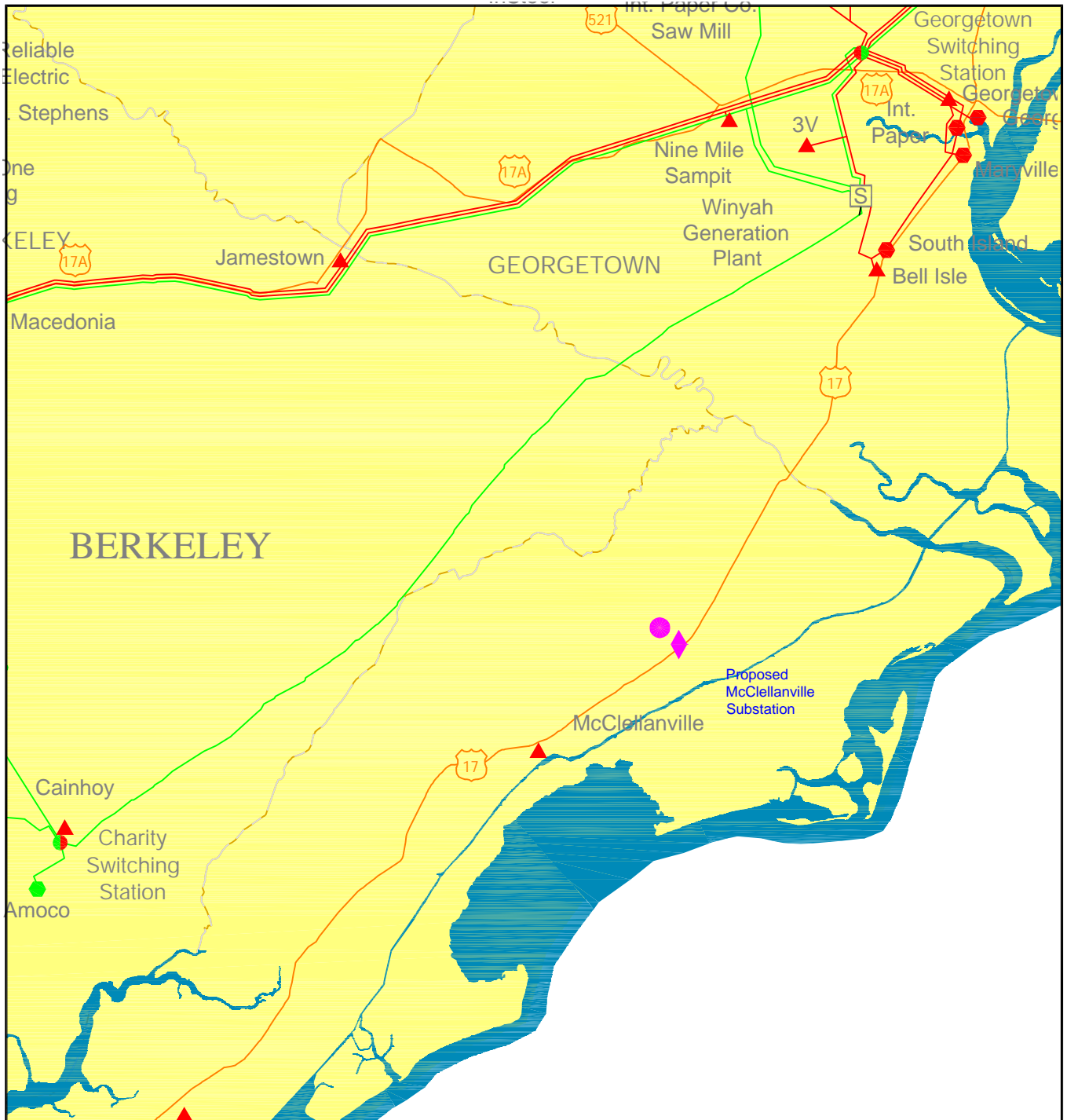
| year | average demand kW | total annual energy mWh | demand losses kW | losses mWh | demand chg \$/kW/mo | eng chg mills/kWh | Loss cost \$ | demand and energy cost \$ | Generator Oper. Cost \$ | Syst. Charge \$ | Fix.Charges \$ | additional capital cost \$ | present value \$ |
|------|-------------------|-------------------------|------------------|------------|---------------------|-------------------|--------------|---------------------------|-------------------------|-----------------|----------------|----------------------------|------------------|
| 1 | 18000 | 39,420 | 1,857 | 4,066 | \$14.85 | 25.5 | 434,510 | 4,212,454 | 0 | 163,860 | 70,000 | 0 | \$4,880,823 |
| 2 | 18630 | 40,800 | 1,989 | 4,356 | \$15.30 | 26.1 | 478,867 | 4,485,488 | 0 | 164,269 | 70,000 | 0 | \$4,904,363 |
| 3 | 19282 | 42,228 | 2,131 | 4,666 | \$15.76 | 26.8 | 527,754 | 4,776,240 | 0 | 164,680 | 70,000 | 0 | \$4,929,401 |
| 4 | 19957 | 43,706 | 2,282 | 4,998 | \$16.23 | 27.4 | 581,635 | 5,085,861 | 0 | 165,092 | 70,000 | 0 | \$4,955,926 |
| 5 | 20655 | 45,235 | 2,445 | 5,354 | \$16.72 | 28.1 | 641,019 | 5,415,576 | 0 | 165,504 | 70,000 | 0 | \$4,983,932 |
| 6 | 21378 | 46,819 | 2,619 | 5,736 | \$17.22 | 28.8 | 706,469 | 5,766,691 | 0 | 165,918 | 70,000 | 0 | \$5,013,414 |
| 7 | 22127 | 48,457 | 2,806 | 6,144 | \$17.73 | 29.5 | 778,605 | 6,140,596 | 0 | 166,333 | 70,000 | 0 | \$5,044,370 |
| 8 | 22901 | 50,153 | 3,005 | 6,582 | \$18.27 | 30.3 | 858,111 | 6,538,773 | 0 | 166,749 | 70,000 | 0 | \$5,076,802 |
| 9 | 23703 | 51,909 | 3,219 | 7,051 | \$18.81 | 31.0 | 945,739 | 6,962,798 | 0 | 167,166 | 70,000 | 0 | \$5,110,714 |
| 10 | 24532 | 53,725 | 3,449 | 7,553 | \$19.38 | 31.8 | 1,042,320 | 7,414,351 | 0 | 167,584 | 70,000 | 0 | \$5,146,116 |
| 11 | 25391 | 55,606 | 3,694 | 8,091 | \$19.96 | 32.6 | 1,148,769 | 7,895,222 | 0 | 168,003 | 70,000 | 0 | \$5,183,016 |
| 12 | 26279 | 57,552 | 3,958 | 8,667 | \$20.56 | 33.4 | 1,266,094 | 8,407,316 | 0 | 168,423 | 70,000 | 0 | \$5,221,429 |
| 13 | 27199 | 59,566 | 4,239 | 9,284 | \$21.18 | 34.3 | 1,395,407 | 8,952,662 | 0 | 168,844 | 70,000 | 0 | \$5,261,371 |
| 14 | 28151 | 61,651 | 4,541 | 9,946 | \$21.81 | 35.1 | 1,537,935 | 9,533,422 | 0 | 169,266 | 70,000 | 0 | \$5,302,861 |
| 15 | 29137 | 63,809 | 4,865 | 10,654 | \$22.46 | 36.0 | 1,695,028 | 10,151,898 | 0 | 169,689 | 70,000 | 0 | \$5,345,921 |
| 16 | 30156 | 66,042 | 5,211 | 11,413 | \$23.14 | 36.9 | 1,868,174 | 10,810,542 | 0 | 170,113 | 70,000 | 0 | \$5,390,576 |
| 17 | 31212 | 68,354 | 5,582 | 12,226 | \$23.83 | 37.8 | 2,059,016 | 11,511,966 | 0 | 170,538 | 70,000 | 0 | \$5,436,854 |
| 18 | 32304 | 70,746 | 5,980 | 13,096 | \$24.55 | 38.8 | 2,269,363 | 12,258,952 | 0 | 170,965 | 70,000 | 0 | \$5,484,785 |
| 19 | 33435 | 73,222 | 6,406 | 14,029 | \$25.28 | 39.7 | 2,501,209 | 13,054,461 | 0 | 171,392 | 70,000 | 0 | \$5,534,403 |
| 20 | 34605 | 75,785 | 6,862 | 15,028 | \$26.04 | 40.7 | 2,756,752 | 13,901,650 | 0 | 171,821 | 70,000 | 0 | \$5,585,743 |
| 21 | 35816 | 78,437 | 7,351 | 16,099 | \$26.82 | 41.8 | 3,038,416 | 14,803,879 | 0 | 172,250 | 70,000 | 0 | \$5,638,846 |
| 22 | 37070 | 81,183 | 7,875 | 17,246 | \$27.63 | 42.8 | 3,348,872 | 15,764,727 | 0 | 172,681 | 70,000 | 0 | \$5,693,754 |
| 23 | 38367 | 84,024 | 8,436 | 18,474 | \$28.46 | 43.9 | 3,691,064 | 16,788,008 | 0 | 173,113 | 70,000 | 0 | \$5,750,512 |
| 24 | 39710 | 86,965 | 9,036 | 19,790 | \$29.31 | 45.0 | 4,068,238 | 17,877,782 | 0 | 173,545 | 70,000 | 0 | \$5,809,167 |
| 25 | 41100 | 90,009 | 9,680 | 21,199 | \$30.19 | 46.1 | 4,483,973 | 19,038,375 | 0 | 173,979 | 70,000 | 0 | \$5,869,773 |
| 26 | 42538 | 93,159 | 10,369 | 22,709 | \$31.10 | 47.2 | 4,942,211 | 20,274,392 | 0 | 174,414 | 70,000 | 0 | \$5,932,382 |
| 27 | 44027 | 96,420 | 11,108 | 24,326 | \$32.03 | 48.4 | 5,447,301 | 21,590,742 | 0 | 174,850 | 70,000 | 0 | \$5,997,054 |
| 28 | 45568 | 99,794 | 11,899 | 26,059 | \$32.99 | 49.6 | 6,004,034 | 22,992,651 | 0 | 175,287 | 70,000 | 0 | \$6,063,848 |
| 29 | 47163 | 103,287 | 12,747 | 27,915 | \$33.98 | 50.9 | 6,617,695 | 24,485,685 | 0 | 175,725 | 70,000 | 0 | \$6,132,830 |
| 30 | 48814 | 106,902 | 13,655 | 29,903 | \$35.00 | 52.1 | 7,294,105 | 26,075,773 | 0 | 176,165 | 70,000 | 0 | \$6,204,067 |
| | | | | | | | sum of PV | | | | | | \$162,885,055 |

Route C
 Station Name ADDING McClellanville through 29 miles of 115 kV transmission from Winyah Gen. Station
 Member BERKELEY

discount rate % 6.00%
 load groth rate %/yr 3.5%
 Year 1 Loss delta kW 397.26
 Demand Chg. \$/kW/mo \$11.658 Year 1
 Eng Chg. mills/kWh 20 Year 1
 Dem Chg increase %/yr 3.0%
 Eng Chg increase %/yr 2.5%
 Load Factor of load 50.00%

RESULTS
 Sum of PV year 1
 \$103,082,993

| year | average demand kw | total annual energy mWh | demand losses kw | rgy losses mWh | demand chg \$/kW/mo | eng chg mills/kWh | Loss cost \$ | demand and energy cost \$ | Generator Oper. Cost \$ | Syst. Charge \$ | Fix.Charges \$ | additional capital cost \$ | present value \$ |
|------|----------------------|----------------------------|---------------------|-------------------|------------------------|----------------------|-----------------|------------------------------|----------------------------|--------------------|-------------------|-------------------------------|------------------|
| 1 | 16800 | 36,792 | 397 | 870 | \$11.66 | 20.0 | 72,976 | 3,086,093 | 0 | 0 | 0 | 0 | \$3,159,068 |
| 2 | 17388 | 38,080 | 426 | 932 | \$12.01 | 20.5 | 80,425 | 3,286,121 | 0 | 0 | 0 | 0 | \$3,175,987 |
| 3 | 17997 | 39,413 | 456 | 998 | \$12.37 | 21.0 | 88,636 | 3,499,130 | 0 | 0 | 0 | 0 | \$3,193,099 |
| 4 | 18626 | 40,792 | 488 | 1,069 | \$12.74 | 21.5 | 97,685 | 3,725,962 | 0 | 0 | 0 | 0 | \$3,210,407 |
| 5 | 19278 | 42,220 | 523 | 1,146 | \$13.12 | 22.1 | 107,659 | 3,967,515 | 0 | 0 | 0 | 0 | \$3,227,919 |
| 6 | 19953 | 43,697 | 560 | 1,227 | \$13.51 | 22.6 | 118,651 | 4,224,746 | 0 | 0 | 0 | 0 | \$3,245,639 |
| 7 | 20651 | 45,227 | 600 | 1,315 | \$13.92 | 23.2 | 130,766 | 4,498,673 | 0 | 0 | 0 | 0 | \$3,263,572 |
| 8 | 21374 | 46,810 | 643 | 1,408 | \$14.34 | 23.8 | 144,119 | 4,790,382 | 0 | 0 | 0 | 0 | \$3,281,725 |
| 9 | 22122 | 48,448 | 689 | 1,509 | \$14.77 | 24.4 | 158,836 | 5,101,028 | 0 | 0 | 0 | 0 | \$3,300,104 |
| 10 | 22897 | 50,144 | 738 | 1,616 | \$15.21 | 25.0 | 175,057 | 5,431,841 | 0 | 0 | 0 | 0 | \$3,318,714 |
| 11 | 23698 | 51,899 | 790 | 1,731 | \$15.67 | 25.6 | 192,935 | 5,784,133 | 0 | 0 | 0 | 0 | \$3,337,563 |
| 12 | 24527 | 53,715 | 847 | 1,854 | \$16.14 | 26.2 | 212,639 | 6,159,299 | 0 | 0 | 0 | 0 | \$3,356,658 |
| 13 | 25386 | 55,595 | 907 | 1,987 | \$16.62 | 26.9 | 234,358 | 6,558,826 | 0 | 0 | 0 | 0 | \$3,376,004 |
| 14 | 26274 | 57,541 | 972 | 2,128 | \$17.12 | 27.6 | 258,295 | 6,984,298 | 0 | 0 | 0 | 0 | \$3,395,610 |
| 15 | 27194 | 59,555 | 1,041 | 2,280 | \$17.63 | 28.3 | 284,679 | 7,437,401 | 0 | 0 | 0 | 0 | \$3,415,483 |
| 16 | 28146 | 61,639 | 1,115 | 2,442 | \$18.16 | 29.0 | 313,758 | 7,919,932 | 0 | 0 | 0 | 0 | \$3,435,631 |
| 17 | 29131 | 63,797 | 1,194 | 2,616 | \$18.71 | 29.7 | 345,810 | 8,433,804 | 0 | 0 | 0 | 0 | \$3,456,062 |
| 18 | 30151 | 66,030 | 1,280 | 2,802 | \$19.27 | 30.4 | 381,138 | 8,981,054 | 0 | 0 | 0 | 0 | \$3,476,785 |
| 19 | 31206 | 68,341 | 1,371 | 3,002 | \$19.85 | 31.2 | 420,076 | 9,563,854 | 0 | 0 | 0 | 0 | \$3,497,808 |
| 20 | 32298 | 70,733 | 1,468 | 3,216 | \$20.44 | 32.0 | 462,994 | 10,184,515 | 0 | 0 | 0 | 0 | \$3,519,140 |
| 21 | 33428 | 73,208 | 1,573 | 3,445 | \$21.06 | 32.8 | 510,300 | 10,845,498 | 0 | 0 | 0 | 0 | \$3,540,791 |
| 22 | 34598 | 75,771 | 1,685 | 3,690 | \$21.69 | 33.6 | 562,440 | 11,549,428 | 0 | 0 | 0 | 0 | \$3,562,771 |
| 23 | 35809 | 78,423 | 1,805 | 3,953 | \$22.34 | 34.4 | 619,911 | 12,299,096 | 0 | 0 | 0 | 0 | \$3,585,090 |
| 24 | 37063 | 81,167 | 1,933 | 4,234 | \$23.01 | 35.3 | 683,257 | 13,097,477 | 0 | 0 | 0 | 0 | \$3,607,759 |
| 25 | 38360 | 84,008 | 2,071 | 4,536 | \$23.70 | 36.2 | 753,080 | 13,947,742 | 0 | 0 | 0 | 0 | \$3,630,788 |
| 26 | 39703 | 86,949 | 2,219 | 4,859 | \$24.41 | 37.1 | 830,041 | 14,853,263 | 0 | 0 | 0 | 0 | \$3,654,188 |
| 27 | 41092 | 89,992 | 2,377 | 5,205 | \$25.14 | 38.0 | 914,870 | 15,817,637 | 0 | 0 | 0 | 0 | \$3,677,973 |
| 28 | 42530 | 93,141 | 2,546 | 5,576 | \$25.90 | 39.0 | 1,008,373 | 16,844,693 | 0 | 0 | 0 | 0 | \$3,702,154 |
| 29 | 44019 | 96,401 | 2,727 | 5,973 | \$26.67 | 39.9 | 1,111,437 | 17,938,508 | 0 | 0 | 0 | 0 | \$3,726,743 |
| 30 | 45560 | 99,775 | 2,922 | 6,398 | \$27.47 | 40.9 | 1,225,039 | 19,103,426 | 0 | 0 | 0 | 0 | \$3,751,755 |
| | | | | | | | sum of PV | | | | | | \$103,082,993 |



Case #7 (On Site Generation) evaluates the construction of the McClellanville substation with on site generation capable of serving up to 5 MW. The initial capital cost of this project is \$12,100,000. The third generator is added in the second year of operation. The system is operated over 30 years and the present value cost of system over this period is \$162,339,269. The total system cost over the lifetime is \$174,439,269.

- 69 kV or Below Transmission Line
- 115 kV Transmission Line
- 230 kV Transmission Line
- - - - Transmission Line not in Operation
- ◆— Proposed Transmission
- Transmission Interconnection (Indicating Utility)
- Central Electric Power Cooperative Substation
- Central Electric Power Cooperative Switching Station
- Santee Cooper Substation
- Santee Cooper Switching Station
- Combustion Turbine Generating Station
- Hydro Generating Station
- Nuclear Generating Station
- Steam Generating Station
- South Carolina Interstates and Highways



**CENTRAL
ELECTRIC
POWER**
COOPERATIVE, INC.

P.O. BOX 1455 / 121 GREYSTONE BLVD.
COLUMBIA, SOUTH CAROLINA 29202
(803) 779-4976

Exhibit "A"
McClellanville Options
Case 7

01-08-06
DRAWN BY: J TINDAL
SCALE: 1 = 5 MILES