



**SOUTHERN MARYLAND ELECTRIC COOPERATIVE, INC.  
HUGHESVILLE, MD**

**HOLLAND CLIFF – HEWITT ROAD  
230 KV TRANSMISSION LINE PROJECT  
ELECTRIC ALTERNATIVE EVALUATION STUDY**

**BLACK & VEATCH CORPORATION**

**B&V Project 146026(G)  
B&V File 32.0201**

**REVISION 0**

**August 17, 2008**



**Electric Alternative Evaluation Study**  
**For the Proposed**  
**Holland Cliff – Hewitt Road 230kV Transmission Line Project**

**EXECUTIVE SUMMARY**

Southern Maryland Electric Cooperative, Inc. (“SMECO” or “Cooperative”) is proposing to construct a new 230kV double circuit transmission line from SMECO’s Holland Cliff switching station in northern Calvert County, Maryland to the SMECO Hewitt Road switching station in St. Mary’s County, Maryland. Also proposed as part of this project is the southern Calvert County 230/69kV switching station that would be connected to this line and be located between the Holland Cliff and Hewitt Road switching stations in the vicinity of the existing SMECO Calvert Cliffs 69kV transmission line tap near the intersection of Pardue Road and Maryland State Route 4. The new 230kV Holland Cliff to Hewitt Road transmission line and associated southern Calvert County 230/69kV switching station is being proposed to meet growth of electrical energy demands and improve system reliability within SMECO’s service area (refer to Figure 1 - Study Area Map on page 2).

Funding for the project can come from any number of sources, including the Rural Utilities Service, an agency that administers the programs of the USDA Rural Development Utilities Programs (USDA Rural Development). The purpose of this study is to identify reasonable electric alternatives considered to address the project need, provide a recommendation for the preferred solution that addresses all aspects of the project need, support the preparation of an Environmental Assessment (EA), and to solicit information and concerns regarding this project from agencies and the Public at the RUS scoping meeting.

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## **LIST OF ABBREVIATIONS**

AAC	All Aluminum Conductor
ACSR	Aluminum Conductor Steel Reinforced
BER	Borrowers Environmental Report
BGE	Baltimore Gas & Electric
Customer Members	Customers whose electric service is provided by SMECO
EA	Environmental Assessment
Ft	foot
kV	kilovolts
MW	megawatts
MWH	megawatt-hour
MVA	megavolt-ameres
PAX River	Patuxent River Navel Air Station
PEPCO	Potomac Electric Power company
Proposed Project	Holland Cliff – Hewitt Road 230kV Transmission Line Project
PSC	Public Services Commission
RD	Rural Development
RUS	Rural Utilities Service
SMECO	Southern Maryland Electric Cooperative, Inc.
USDA	United States Department of Agriculture

## **1.0 INTRODUCTION**

SMECO is an unaffiliated electric transmission and distribution cooperative headquartered approximately twenty-five miles southeast of Washington D.C. in Hughesville, Maryland. SMECO presently serves more than 140,000 customer-members throughout Calvert, St. Mary's, Charles, and southern Prince George's Counties in southern Maryland.

SMECO's Holland Cliff – Hewitt Road 230kV Transmission Line Project (the Proposed Project) is an expansion of SMECO's existing 230kV system, and it provides for long-term growth and system reliability. The Proposed Project is needed to solve several short- and long-term issues regarding the supply of normal electric loads and outage contingency loads. These issues affect SMECO's ability to continue to reliably serve its customer-members in the most efficient, cost-effective manner possible. The system demand and system reliability issues solved by the Proposed Project will be discussed further in Section 3.0 Project Need of this document.

There are four generating plants located in SMECO's service area: Chalk Point Generating Station, Morgantown Generating Station, Calvert Cliffs Nuclear Power Plant, and the Panda-Brandywine Cogeneration Plant. Chalk Point (2,417 MW) and Morgantown (1,492 MW) are coal, oil, gas, and steam plants owned by Mirant. Calvert Cliffs Nuclear Power Plant (1,735 MW) is owned by Constellation Energy. A natural gas-fired combined cycle plant with a capacity of 230 MW, owned by Panda-Brandywine, is located in southern Prince George's County.

SMECO has 3,688 miles of overhead distribution, 5,815 miles of underground distribution, and 394 miles of transmission line. SMECO's transmission system is primarily energized at 69kV. Figure 2 – Holland Cliff – Hewitt Road 230kV Transmission Line Project Map included on page 4 illustrates SMECO's existing and proposed 230kV transmission line facilities.

SMECO has reviewed many options to address the need for additional capacity throughout SMECO's system and locally within Calvert County, as well as, options to improve reliability in Calvert and St. Mary's counties. These alternatives will be reviewed in Section 4.0 Alternatives.

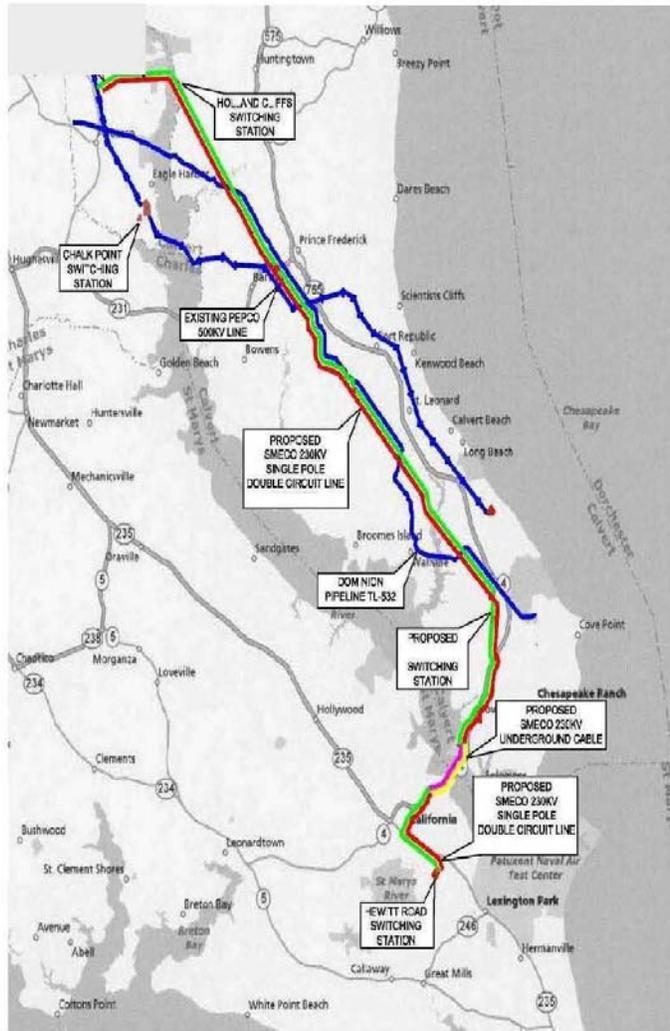


Figure 1 – Study Area Map

## **2.0 PROJECT DESCRIPTION**

As previously indicated the Proposed Holland Cliff – Hewitt Road 230kV Transmission Line Project will start at the SMECO Holland Cliff switching station and end at the SMECO Hewitt Road switching station and will consist of the following components:

- Install 20 miles of new 230kV single pole, double circuit transmission line from the Holland Cliff station to a new southern Calvert County switching station. The new 230kV transmission line will be constructed in an existing, 100 ft, 69kV transmission line right-of-way.
- Construct a new 230/69kV switching station located in southern Calvert County in the vicinity of the existing SMECO Calvert Cliffs 69kV transmission line tap near the intersection of Pardue Road and Maryland State Route 4. The new 230/66kV switching station fenced area will cover approximately 4 acres.
- Construct a new 230kV two-mile river crossing under the Patuxent River from Solomons to Town Creek.
- Install eight miles of new 230kV single pole, double circuit transmission line from a new southern Calvert County switching station to the existing Hewitt Road switching station in Lexington Park (St. Mary's County). The new 230kV transmission line will be constructed in an existing 69kV transmission line right-of-way.
- Add a new transmission line terminal position in the existing Hewitt Road switching station. The additions at the existing Hewitt Road switching station will be installed within the existing fenced area.

As illustrated in Figure 2, SMECO has an existing 230kV transmission line that runs through St. Mary's County, from Ryceville (in Charles County) to the Hewitt Road switching station in Lexington Park (in St. Mary's County). SMECO also has a 230kV transmission line that runs from the Aquasco switching station (in Prince George's County) to the Holland Cliff switching station (in Calvert County). These two 230kV transmission lines are interconnected to each other by a 230kV transmission line that runs from Morgantown through Chalk Point to the new Aquasco switching station. PEPCO owns and operates the 230kV switching stations at Morgantown, Chalk Point, and Aquasco and the 230kV transmission lines that connect them. The installation of the proposed Holland Cliff to Hewitt Road 230kV transmission line will complete the 230kV transmission loop.

The Electric Alternative Evaluation Study is prepared in support of an Environmental Assessment from the Rural Utilities Service, an agency that administers the programs of the USDA Rural Development Utilities Programs (USDA Rural Development). The Proposed Project is expected to take more than three years to construct; with a proposed start of construction activities in 2011 resulting in a scheduled completion of construction in 2015. SMECO is also currently developing information required to support the Certificate of Public Convenience and Necessity (CPCN) application for review by the Maryland Public Service Commission (PSC).

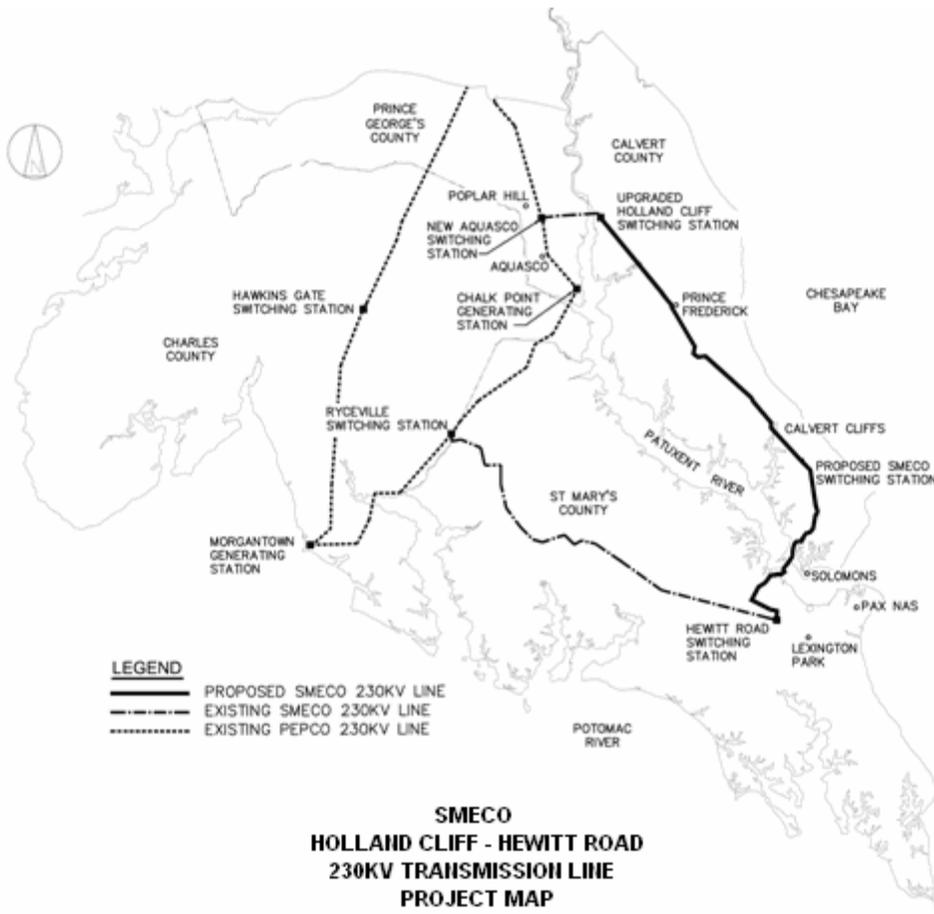


Figure 2 – Holland Cliff – Hewitt Road 230kV Transmission Line Project Map

### **3.0 PROJECT NEED**

The Holland Cliff – Hewitt Road 230kV Transmission Line Project is needed to support the increasing system demand and ensure a reliable electric system for the Cooperative’s customer-members. Because the demand for electricity is continually increasing on the SMECO system, there is a need to improve the transmission system to ensure continued reliability.

#### **Meet System Demand**

Southern Maryland has grown over the past 20 years; it is now the fastest growing region in the state. The population of the tri-county area has increased from 78,273 in 1986 to 141,964 in 2006. Our customer base has doubled since 1986, while annual demand has more than doubled from 331 MW in 1986 to 845 MW in 2006. Energy sales have also more than doubled, from 1,403,757 MWH in 1986 to 3,260,036 MWH in 2006.

SMECO customer-members have also increased in Calvert County, more than doubling from 13,785 in 1986 to 30,109 in 2006. With the increased number of residents comes additional community infrastructure, schools, and businesses to support the growth, resulting in an increase in electrical load. While customer-members have doubled in Calvert County, energy demand has more than tripled from 61 MW in 1986 to 203 MW in 2006. Energy sales over the same period have almost tripled from 242,837 MWH in 1986 to 686,720 MWH in 2006.

Calvert County had only one reliable energy source or transmission line from Chalk Point serving customer demand until 1986 when the 69kV line was rebuilt from SMECO’s Chalk Point Substation to SMECO’s Holland Cliff switching station. Not until 1993 was another energy source or transmission line installed into Calvert County. In 1993 SMECO installed a two mile 69kV submarine cable in the lower Patuxent River parallel to the Thomas Johnson Bridge near Solomons. This cable failed in January 2005. Restoring service to southern Calvert County required 69kV transmission circuits from northern Calvert County to supply power over 21 miles on one of the coldest days of the year. SMECO’s electrical system studies indicate that there will be insufficient capacity to restore service in this manner by 2015. The Proposed Project addresses this concern and would provide the energy source required to eliminate this issue.

### Ensure System Reliability

SMECO's electrical system studies also confirm that the existing SMECO 69kV and 230kV electric transmission infrastructure, including the 230/69kV Holland Cliff switching station presently being constructed, is adequate to handle expected peak system loads in northern Calvert County under normal conditions until 2015. However, these same studies reveal that there are four transmission line outage contingency situations that will be present if the Proposed Project is not completed by the end of 2015. All four outage contingency concerns are eliminated when the Proposed Project infrastructure is operational. The four transmission line outage contingency scenarios include:

**1. Loss of SMECO's 69kV line #6786 between the Dukes Inn substation and the Mutual substation.** Under this scenario, all load south of Dukes Inn substation must be served via SMECO's 69kV transmission line #6770 out of the Hewitt Road switching station. Part of the 69kV transmission line #6770 circuit is comprised of a submarine cable. This cable is rated for ~875 amps. The resultant contingency load is expected to be ~1,014 amps, which would cause an overload on the submarine cable. The Mutual substation load will have to be dumped to prevent the submarine cable from being overloaded if this contingency occurs during peak load conditions. This puts the center of Calvert County at risk of an extended outage that could last from 24 hours to 5 days depending on the amount of damage that must be repaired/replaced.

**2. Loss of the SMECO dual circuit 230kV pole line #2350 / #2355 between the Aquasco switching station and the Holland Cliff switching station.** Under this scenario, all load north of the Mutual substation in Calvert County will be served by the parallel combination of 69kV transmission lines #6705 and #6706 and all load south of Mutual substation will be served through the 69kV transmission submarine cable #6770 discussed in scenario #1 above. Both lines (#6770 and #6706) are at maximum emergency load capacity and line #6705 is loaded to 104% emergency load capacity. In this scenario the Dunkirk substation distribution feeders #21 and #22 will need to be dropped (i.e., all load north of Dunkirk substation) to prevent line #6705 from being overloaded. This puts the northern part of Calvert County at risk of an extended outage that could last from 3 to 10 days depending on the amount of damage that must be repaired/replaced.

**3. Loss of SMECO 69kV line #6770 between Hewitt Road switching station and Solomons substation.** Under this scenario, all load south of Prince Frederick substation is served by the parallel combination of 69kV transmission lines #6705

and #6706. Line #6705 is loaded to maximum emergency load capacity and end of line voltage drop is at maximum allowable limits. SMECO's electrical system studies predict that this contingency cannot be supported beyond 2015. This puts the southern part of Calvert County at risk of daily brownout outages during peak load conditions for a period of up to 5 days if the failure occurs on an overhead line section of line #6770 or up to 3 months if the failure occurs on the submarine cable section of line #6770.

**4. Loss of the SMECO dual circuit 230kV pole line #2320E / #2320W between the Ryceville switching station and the Hewitt Road switching station.** Under this scenario, all possible load is served via the 69kV transmission lines #6740 and #6750 out of Hughesville substation. It is assumed that any load that could be shifted from Hughesville substation to other power supply points is appropriately transferred. The two 69kV transmission lines #6703 and #6704 serving the Hughesville substation are at maximum emergency load capacity and all load south of about Hollywood and Leonardtown substations will be dumped. End of line voltage drop is at maximum allowable limits. This contingency scenario already exists in 2008. This puts all of south St. Mary's County, including PAX River, at risk of an extended outage that could last from 3 to 10 days depending on the amount of damage that must be repaired/replaced.

#### **4.0 ALTERNATIVES**

As indicated previously, SMECO's number of customer-members has more than doubled in the past 20 years, and their corresponding energy use has also more than doubled over that same time period. In studying project alternatives, SMECO reviewed a number of possible solutions to address the following main issues:

- Growth of the Southern Maryland area and increased electrical demand.
- Construction of a reliable system that accounts for outage contingencies.

Initially, at least nine (9) different solutions were considered to address the potential overloads of key transmission facilities and to protect against single contingency outage scenarios that would expose sections of the SMECO service territory to extended outages. Based on the initial transmission system studies screening, some of the solutions were eliminated while others were combined to address the electrical demand and reliability issues identified above. The number of solutions involving new construction to be evaluated was reduced to six (6).

Types of evaluated alternatives include the no action alternative (**Alternative 1**), the installation of new generation (**Alternative 2**), upgrades to existing transmission facilities (**Alternative 4**), and construction of new transmission facilities (**Alternatives 3, 5, 6, & 7**). Other alternatives including underground construction of transmission facilities were considered but eliminated from further consideration (except for the Patuxent River 230kV Underground River Crossing included in Alternative 7) due to excessive costs. The alternatives evaluated are described in more detail below.

**Alternative 1: Make no improvements to transmission system.**

This alternative would make SMECO's system vulnerable to long-term outages, because there is a lack of redundancy for the areas served in Calvert County and St. Mary's County's. Thus, reliability needs to be improved to enhance electrical system operational flexibility and reduce the potential for an extended outage contingency on the local transmission system. The 'no action' alternative would increase the potential for wide area blackouts under contingency situations, violate good engineering practices for transmission planning, and indicate neglect of responsibilities by SMECO, which is charged with providing adequate and reliable electric service to its customer-members.

**Alternative 2: Install new generation.**

SMECO has four generation facilities located in its service area, and a fifth is proposed to be located in Charles County. None of these generation facilities are owned by SMECO. Building an additional plant in Calvert or St. Mary's County would be expensive and unnecessary. This alternative is considered excessive, and does not provide a solution for delivering power to the areas where it is most required, nor does it improve reliability for SMECO's customer-members.

**Alternative 3: Interconnect with the Calvert Cliffs nuclear generation facility 500kV system.**

The nuclear plant has a 500kV transmission system that is built for bulk power transmission and is not available for local service. An interconnection would require the development of major 500kV electrical interconnection facilities and would not eliminate the need for a large portion of the proposed 230kV facilities identified in the Holland Cliff – Hewitt Road 230kV Transmission Line Project. In addition, if SMECO were to connect with BGE's transmission system, the interconnection would trigger federal regulations regarding wheeling power through SMECO's existing transmission system. This would require SMECO to make additional modifications to their transmission system as well as change how they operate the system. SMECO currently has no

experience with 500kV equipment, service, nor do they maintain 500kV spare parts. From both an engineering/construction and operations perspective, this would be a costly solution with limited benefit.

**Alternative 4: Upgrade the Calvert County 69kV transmission system voltage to 138kV.**

This alternative would consist of re-building approximately 60 miles of existing 69kV transmission lines to 138kV and the installation of 230/138kV transformers at the Holland Cliff switching station. Although this option could provide a local reliable loop service, it would require rebuilding the affected transmission lines to support a higher voltage and changing all distribution substation transformers. Converting part of SMECO's system to 138kV, a non-standard SMECO voltage, would also isolate Calvert County from the rest of SMECO's service area and would limit future capacity. SMECO would still need a second line to southern Calvert County because the existing transmission source from Hewitt Road can only be energized at 69kV which will not provide sufficient capacity in a contingency situation. Also, long duration outages of the existing 69kV transmission lines to facilitate the rebuilds would significantly reduce the reliability of the SMECO transmission system in Calvert County regardless of the load period. Finally, SMECO currently has no experience with 138kV equipment, service, nor do they maintain 138kV spare parts. From both an engineering/construction and operations perspective, this would be a costly solution with limited benefit.

**Alternative 5: Ryceville/Morgantown – Hewitt Road 230kV Line**

This alternative would consist of the following sub-projects:

- Install a new 230kV transmission line from either SMECO's Ryceville switching station (~24 miles) or PEPCO's Morgantown switching station (~36 miles).
- Modify either the Ryceville switching station or the Morgantown switching station to accommodate the new transmission line interconnect.
- Modify the Hewitt Road switching station to accommodate the new transmission line interconnect.
- Replace the existing 254 MVA transformers located in PEPCO's Chalk Point switching station with larger units to increase service capacity to SMECO's Chalk Point switching station.

A new line from Morgantown to Hewitt Road would need to cross the Wicomico River; otherwise, the line would go from Morgantown to the area near Ryceville and then south to Hewitt Road. This alternative would require new right-of-way to be acquired and cleared to accommodate the new transmission line. Optimally, the new transmission line

would be located away from the right-of-way where the existing Ryceville – Hewitt Road 230kV transmission line is located to prevent both lines from being affected by a single event. Similarly, it is not acceptable to tap the existing Ryceville – Hewitt Road 230kV transmission line as this would also make the sources susceptible to a single failure event. This solution adds capacity and reliability for St. Mary’s County and addresses the system demand issue in Calvert County. However, this alternative does not address the system reliability issues in either northern or southern Calvert County, thus leaving those areas susceptible to extended outages on the area transmission system under contingency situations.

### **Alternative 6: Chalk Point – Hughesville 230kV Line**

This alternative would consist of the following sub-projects:

- Install a new 230kV transmission line from PEPCO’s Chalk Point switching station to SMECO’s Hughesville switching station (~9 miles).
- Install a new 230kV transmission line from the Hughesville switching station to the Hewitt Road switching station (~32 miles).
- Expand the existing Hughesville switching station to install a new 230/69kV interconnection.
- Modify the Chalk Point switching station to accommodate the new transmission line interconnect.
- Modify the Hewitt Road switching station to accommodate the new transmission line interconnect.
- Re-conductor approximately 6 miles of existing 69kV transmission line #6705 and approximately 7 miles of existing 69kV transmission line #6706.
- Install a new 69kV transmission line from SMECO’s Chalk Point switching station to southern Calvert County (~20 miles).

To support this alternative, SMECO would need to acquire and clear approximately 61 miles of new right-of-way to accommodate the new transmission line construction. The addition of the 230kV system improvements adds capacity and reliability for St. Mary’s County but does not address the system demand or system reliability issues in Calvert County. The Calvert County system demand and reliability issues are addressed by the increase in capacity provided by the re-conductoring of the 69kV transmission lines (#6705 & #6706) and the addition of the new 69kV transmission line to southern Calvert County. Re-conductoring these transmission lines would include installing new poles and replacing the existing conductor (556 MCM ACSR) with new conductor (1590 MCM AAC) or using the existing structures with a high temperature composite core

conductor. Voltage degradation would require a regulating transformer or a shunt capacitor bank to support end-of-line voltage on the new 69kV transmission line. This solution is very costly and provides limited future capacity and reliability benefit for Calvert County.

Total Cost = \$105,000,000 (See Table 2 in the Appendix)

### **Alternative 7: Holland Cliff – Hewitt Road 230kV Line**

This alternative would consist of the following sub-projects:

- Install a new 230kV transmission line from the Holland Cliff station to a new southern Calvert County switching station (~20 miles).
- Install a new 230/69kV switching station located in southern Calvert County.
- Install a new 230kV underground transmission line circuit under the Patuxent River (~2 miles).
- Install a new 230kV transmission line from a new southern Calvert County switching station to the existing Hewitt Road switching station (~8 miles).
- Modify the Hewitt Road switching station to accommodate the new transmission line interconnect.

The new 230kV single pole, double circuit transmission lines listed above will be installed in an existing 69kV transmission line right-of-way eliminating the need to acquire and clear new right-of-way. The new 230/69kV southern Calvert County switching station will be located in the vicinity of the existing SMECO Calvert Cliffs 69kV transmission line tap near the intersection of Pardue Road and Maryland State Route 4. The new 230/66kV switching station fenced area will cover approximately 4 acres. The new 230kV two-mile river crossing under the Patuxent River will be installed from Solomons to Town Creek. The additions at the existing Hewitt Road switching station will be installed within the existing fenced area. This alternative addresses the demand issue for southern Calvert County and the reliability requirements for both Calvert and St. Mary's counties. The Holland Cliff – Hewitt Road 230kV Line alternative provides the needed capacity, system reliability, and operational flexibility required to greatly reduce the chance of an extended outage contingency on the area transmission system.

Total Cost = \$76,500,000 (See Table 3 in the Appendix)

## **5.0 CONCLUSION**

SMECO has a long history of providing reliable electric service to their customer members at an economical price. As stated earlier, SMECO's number of customer

members and their energy use continues to increase. To meet these changes SMECO is required to continually monitor and upgrade their transmission system to provide adequate and reliable electric service to its customer-members. An example of SMECO's responsibility to their customer members is the Aquasco – Holland Cliff 230kV Transmission Line Project presently in construction. The Aquasco – Holland Cliff 230kV Transmission Line Project is required to provide additional system capacity and resolve system reliability issues in SMECO's northern Calvert County service territory. The Aquasco – Holland Cliff 230kV Transmission Line Project needs to be operational by December 2009 to adequately address these issues. The Aquasco – Holland Cliff project was approved in 1976 and re-confirmed by the State of Maryland Public Service Commission on August 7, 2007 (Mailog #104940).

Similarly, the Holland Cliff – Hewitt Road 230kV Transmission Line Project being evaluated in this report will ensure SMECO's ability to continue to reliably serve its customer members in the most reliable and cost-effective manner possible. As presented by this report SMECO has reviewed a number of alternatives in order to address the following main issues which are of concern for the existing transmission system:

- Growth of the Southern Maryland area and increased electrical demand.
- Construction of a reliable system that accounts for outage contingencies.

The primary benefits of the each of the seven (7) alternatives that were evaluated in detail are summarized in Table 1 – Summary of Alternatives

Evaluated Alternatives (“X” indicates that the alternative addresses the demand or reliability issue in the column heading.)	System Demand	Reliability		
		Northern Calvert	Southern Calvert	St. Mary’s
1. Make no improvements to transmission system.				
2. Install new generation.				
3. Interconnect with the Calvert Cliffs nuclear generation facility 500kV system.	X		X	
4. Upgrade the Calvert County 69kV transmission system voltage to 138kV.		X	X	
5. Ryceville/Morgantown – Hewitt Road 230kV Line.	X			X
6. Chalk Point – Hughesville 230kV Line.	X	X	X	X
7. Holland Cliff – Hewitt Road 230kV Line.	X	X	X	X

Table 1 – Summary of Alternatives

In review of the detailed descriptions for each of the alternatives included in this report it is evident that only two of the proposed alternatives address the reliability and demand concerns in the SMECO Southern Maryland service area. Of these two alternatives, the Holland Cliff – Hewitt Road 230kV Line alternative (Alternative 7) provides the greater value to SMECO’s customer members because of its long term benefit by creating a 230kV transmission loop through St. Mary’s and Calvert Counties. Alternative 7 also has a smaller environmental impact because it uses existing right-of-way, is the lowest cost to construct as supported by the cost analysis tables (Table 2 and Table 3) included in the Appendix, and provides additional capacity, operational flexibility, and the high reliability required to greatly reduce the chances for extended outages on the area transmission system.

## **6.0 RECOMMENDATION**

SMECO recommends that the Holland Cliff – Hewitt Road 230kV Line (Alternative 7) be implemented as the chosen solution. The Holland Cliff – Hewitt Road 230kV Line completes a 230kV transmission system loop through St. Mary’s and Calvert counties providing the additional capacity, operational flexibility, and high reliability required to greatly reduce the chances for extended outages on the area transmission system. Engineering design, material procurement, switchyard property acquisition should be timed to support the required fall 2015 in-service date.

**APPENDIX**  
**(Alternatives Cost Analysis)**

**Table 2: Cost Analysis for Alternative 6**

	<b>Cost in \$Millions</b>
<b>Alternative 6: Chalk Point – Hughesville 230kV Line</b>	
- Chalk Point – Hughesville 230kV Transmission Line (9 miles)*	<b>\$13.5</b>
- Hughesville – Hewitt Road 230kV Transmission Line (32 miles)*	<b>\$48.0</b>
- Hughesville 230/69kV Switching Station*	<b>\$13.0</b>
- Chalk Point 230kV Switching Station Interconnect Upgrade	<b>\$2.0</b>
- Hewitt Road 230kV Switching Station Interconnect Upgrade	<b>\$2.0</b>
- Re-conductor Lines #6705 (6 miles) and #6706 (7 miles)	<b>\$6.5</b>
- Chalk Point – southern Calvert 69kV Transmission Line (20 miles)*	<b>\$20</b>
<b>TOTAL</b>	<b>\$105.0</b>

\* = Land and right-of-way costs are not included in the estimate.

**Table 3: Cost Analysis for Alternative 7**

	<b>Cost in \$Millions</b>
<b>Alternative 7: Holland Cliff – Hewitt Road 230kV Line</b>	
- Holland Cliff – Southern Calvert County 230kV Transmission Line (20 miles)	<b>\$30.0</b>
- Southern Calvert County 230/69kV Switching Station	<b>\$13.0</b>
- Patuxent River 230kV Underground River Crossing (2 miles)	<b>\$19.5</b>
- Southern Calvert County – Hewitt Road 230kV Transmission Line (8 miles)	<b>\$12.0</b>
- Hewitt Road 230kV Switching Station Interconnect Upgrade	<b>\$2.0</b>
<b>TOTAL</b>	<b>\$76.5</b>

\* = Land and right-of-way costs are not included in the estimate.