GMB

ARCHITECTS / ENGINEERS

Qualifications for Engineering Services

LEWES BOARD OF PUBLIC WORKS ELECTRIC SYSTEM ANALYSIS AND STUDY

Lewes, Delaware

Presented by:

George, Miles & Buhr, LLC

April 11, 2019

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GMB
GEORGE, MILES & BUHR, LLC

ARCHITECTS
ENGINEERS

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SALISBURY
BALTIMORE
SEAFORD

www.gmbnet.com

April 11, 2019

Lewes Board of Public Works
107 Franklin Ave.
Lewes, DE 19958

Attn: Mr. Darrin Gordon
General Manager

Re: Request for Information (RFI)
Lewes Board of Public Works Electric System Analysis and Study

Dear Mr. Gordon:

George, Miles & Buhr, LLC (GMB) is pleased to respond to the Lewes Board of Public Works (BPW) Request for Information (RFI) regarding Electric System Analysis and Study. We understand that the BPW is seeking a qualified engineering firm capable of providing the work product requested in the RFI Scope of Work and possessing the skills and experience included in the RFI General Requirements. We interpret this to be a State of Delaware licensed engineering firm providing the engineering, electrical utility analysis, planning, and consulting functions required to complete the BPW Study.

GMB is a multidisciplinary engineering firm with electric utility experience in local utilities and through our core team. GMB has developed a local, expert team capable of performing the services requested in the RFI. The team consists of GMB engineers, designers and GIS specialists currently serving the BPW's water and wastewater utility, property development, and expansion of boundary. The team possesses electric utility experience and is specifically familiar with the BPW's electric utility system, equipment, operations, business, and power supply arrangements.

GMB has recently hired key former electric consulting firm employees and developed subconsultant agreements with companies serving Delaware municipal electric utilities. This team consists of GMB, Preston J. Waller & Associates (PWA), and Smart Utility Management (SUM). Key team members have worked for Downes Associates and subsequent companies, providing electric utility services to Lewes, Seaford, Smyrna, and others. The services envisioned by the BPW's Scope of Work is provided by our comprehensive team.

GMB is pleased and proud to serve the BPW as a trusted advisor and will provide electric utility support in the same tradition, with capable team members who are familiar and comfortable with Delaware municipal electric utilities, governance, and staff.

Please do not hesitate to contact me with any questions at 410-251-4900.

Sincerely,

Alexander M. Grier, P.E.
Senior Project Manager

AMG/mse
Enclosures

PROJECT TEAM INTRODUCTION & EXPERIENCE

Executive Summary

In 2018, George Miles & Buhr, LLC (GMB) hired several employees of Downes Associates, Inc. (DAI) as that firm closed. Other employees and former employees of DAI entered or created engineering consulting firms to provide Customers of DAI with consulting services. GMB has created and offers to Lewes BPW, a GMB Team consisting of these experienced individuals to provide similar services to the now closed DAI. The firms of Preston Waller & Associates, Inc. (PWA) and Smart Utility management, LLC (SUM) will serve as proposed sub-consultants for this electric system analysis and study.

The GMB Team consists of GMB, PWA, and SUM. The other members of the Team are Electrical Engineer Jay Waller P.E. of Preston Waller & Associates, Inc.; Chris Simms MBA and David Downes P.E. of Smart Utility Management, LLC.

In January of 2019, GMB assembled the GMB Team to provide a proposal to perform the Lewes BPW System Study Scope of Work included in this RFI with minor modifications. GMB is familiar with the electric system and the project.

In 2014, Lewes BPW engaged David Downes and Chris Simms then of DAI to perform analysis of power supply and Cost of Service impacts related to an initiative by Beebe Hospital. Beebe was considering supplying much of its Lewes BPW baseload electricity using on site combined heat and power equipment provided by a third party. The report found that although the revenue from the hospital would be reduced the energy costs would be greatly reduced and the demand ratchet in the tariff would protect the gross operating margin such that BPW income would not be reduced.

In 1998, DAI provided to Lewes BPW a system study with recommended capital projects to improve the electric system and allow for projected growth. The team was led by Lex Grier P.E. of DAI and included Carol Mister. These former DAI employees are employed by GMB. The report laid out significant changes and capital costs which have been implemented by others with appropriate modifications and form the system Lewes BPW owns and operates today.

RFI General Requirements for Bidders to Demonstrate Prior Experience

1) Analysis of Transmission/Distribution Network for Load Flow/Capacity

a. Jay Waller P.E. working for Borough of Chambersburg, PA; Jeff Heverley, Assistant Electric Superintendent (717-251-2418): Modeling distribution circuits and transmission related changes resulting from voltage conversion projects.

b. Jay Waller P.E. working for Town of Thurmont, MD; Jim Humerick, Chief Administrative Officer (301-271-7313): Modeling distribution circuits to support system short circuit studies.

c. Jay Waller P.E. working for City of Seaford, DE; Bill Bennett, Director of Electric (302-629-9841): Modeling distribution circuits to support system short circuit studies.

2) Transformer and Breaker Sizing

a. Jay Waller P.E. working for Borough of Chambersburg, PA; Jeff Heverley, Assistant Electric Superintendent (717-251-2418): Provided equipment specifications, prepared drawings, and provide construction oversight services for the installation of seven (7) new 15 kV, 1200A feeder circuit breakers. Assess acceptance test results and commission breakers.

b. Jay Waller P.E. working for DAI client City of Seaford, DE; George Owens P.E., President DAI (410-251-1769): Reviewed proposed new Pine St. substation equipment (circuit breakers, transformers, etc.) and equipment sizing based on design requirements and provide third party assessment of apparatus' ability to meet design requirements.

3) Protective Relay Coordination Studies

a. Jay Waller P.E. working for DAI client City of Seaford, DE; George Owens P.E., President DAI (410-251-1769): Performed relay coordination studies. Ensured new Pine Street Substation relaying, including transformer differential relaying with reverse-polarized transformer (internal) ground fault detection settings were prepared correctly.

b. Jay Waller P.E. working for DAI client City of Smyrna, DE; George Owens P.E., President DAI (410-251-1769): Provided coordination studies for new large customers. Prepared recloser settings, specify fuse attributes, and revise substation feeder settings where required.

4) Integration of Renewable Energy Resource

a. Jay Waller P.E. working for Borough of Chambersburg, PA; Jeff Heverley, Assistant Electric Superintendent (717-251-2418): Interconnection of biogas generation and solar at distribution voltage

b. David Downes P.E. working for Borough of Chambersburg, PA; Jeff Heverley, Assistant Electric Superintendent (717-251-2418): Developed rules and regulations for attachment and metering of residential and commercial customers roof top solar panels.

c. Chris Simms MBA working for City of Seaford; Bill Bennett, Electric Director (302-629-9841): Assisted with City's net metering and demand response rules and regulations compliant with DE statutes.

5) Planning for Load Growth of Electric Vehicles

a. David Downes P.E. working for Seaford DE; Chambersburg, PA; Smyrna, DE; Thurmont, MD has researched alternative energy applications for smart grid use in municipal utilities using a variety of sources including APPA and utility newsletters. He would draw on case studies and background reports to anticipate facilities and loads required for Electric Vehicles and address the potential growth scenarios. The business case and required rules would be addressed in the report.

6) Integration of Distributed Generation/Storage/Microgrids

a. Alexander Grier- P.E. (410-251-4900) working for DAI client:

i. Vanderweil Engineers of Boston, Michael Thornton (617-956-4513): Prepared report on reliability of MIT campus microgrid for operation and reliability.

ii. Rauch, Inc., Kevin Jones (410-770-9081): Prepared conceptual design for renewable fueled industrial campus generating heat and power. Generation provided microgrid separation of campus from utility power to maintain heat and power dependent bioprocessing of fuel from waste.

iii. Maryland Environmental Services – Eastern Correctional Institution client of DAI - George Owens P.E., President DAI (410-251-1769): Performed reliability review with recommendations for update and replacement of boiler controls, generation control system, switchgear, dual transformers, and connection to Delmarva Kings Creek Substation.

b. David Downes P.E. working for Darrin Gordon, BPW General Manager: Developed a report on the potential loss of revenue due to Beebe Hospital creating a CHP microgrid using micro turbines.

7) Use of Smart Grid Technology for Energy Efficiency

a. David Downes P.E. working for Seaford DE; Chambersburg, PA; Smyrna, DE; Thurmont, MD has researched alternative energy applications for smart grid use in municipal utilities using a variety of sources including APPA and utility newsletters. He would draw on case studies and background reports for improving operational response and system efficiency improvements.

8) Storm Hardening of Infrastructure

a. Alexander Grier, P.E. for Mt. Dora, Florida – Charles Revell, Utility Director: Prepared drawings and standards for distribution system storm hardening and construction facilitation.

9) Upgrading of Substation/transmission Systems to Improve Reliability

a. Jay Waller, P.E. and Carol Mister for DAI's client City of Seaford, George Owens P.E., President DAI (410-251-1769): Ground grid design and relay coordination, equipment selection and specification, transmission and distribution design of aerial circuits.

b. Jay Waller, P.E. – for Chambersburg, PA – Jeff Heverley, Assistant Electric Superintendent (717-251-2418)

i. Developed solution to improve Substation RTU performance at critical substations. Prepared drawings, specified new equipment, and developed installation plan. Perform installation services and integration services. Modified field devices from various manufacturers (ABB, SEL, Beckwith, Bitronics, etc.) to promote high performance and expanded capability.

ii. Provided equipment specifications prepared drawings and provide construction oversight services for the installation of new Generation Interconnection. Prepared relay settings, reviewed and assessed generation impact to system, and modified system attributes as well as apparatus to support integration of large renewable resource.

PERFORMING THE SCOPE OF WORK (SOW)

I. Receive and review BPW provided documentation.

a. Evaluate the system layout presented on the GIS mapping and data tables.
b. Request from BPW and Delmarva Power the 69 KV interconnection fault current availability.
c. Assess the system loads and meter data for substation circuits and large customers.
d. Review the substation equipment ratings for normal operation and contingency (N-1) operation.
e. Review potential growth and changes to current conditions.
f. Develop questions for Board and staff to clarify concerns and priority of investigation.
g. Perform field survey of system as needed to determine model inputs.
h. Agree with Board and General Manager on depth of analysis (scope) and timing for deliverables (schedule) of Study topics.

II. SOW Item 1a: Perform modeling with current system loading.

a. Evaluate Items 2a thru 2d and include in model parameters. Based upon system model and load information from BPW determine appropriate capacity for:
   i. Transformers under normal and contingency operation.
   ii. Breakers and other electric apparatus at Schley Avenue Substation.
   iii. Transmission line to five points connection to Delmarva 69 KV circuit.
b. Based upon field measurements of voltage and ampacity taken at appropriate points on each circuit during seasonal normal conditions:
   i. Estimate individual circuit loadings and voltage drops.
   ii. Need and location of reactive power support capacitors.
c. Review results and recommend solutions for system problems:
   i. Review results with General Manager and Staff.
   ii. Identify and confirm areas of concern for service reliability, efficiency and risk.

III. SOW Items 1b, and 2d thru 2f: Perform modeling with BPW 5-year load growth projection.

a. Revise model to reflect 5-year growth projection and estimate loading injections.
b. Review results with General Manager and Staff.
c. Identify and confirm areas of concern for service reliability, efficiency, and risk.

IV. SOW Item 4: Determine possible changes to the model developed in Item II and III above.

a. Prepare estimated opportunities to serve Electric Vehicles in general use and at designated charging stations. Opportunities include BPW vehicle use such as meter reading and service vehicles; partnering with local businesses customer visits and employees; seeking grant money for charging stations.
b. Determine realistic savings and operational efficiencies which could alter the 10-year load projection model. Consider distributed generation to shift peak load and reduce circuit or transformer loads as well as defer infrastructure investment.

V. SOW Items 1c, and 2a thru 2f: 10-year projection with Electric Vehicle and renewable resource growth.

a. Determine with Board and Staff type and magnitude of EV loads, Smart technology changes, and potential renewable sources.
b. Revise model to reflect 10-year growth projection.
c. Draft report on system modeling and review with General Manager and Board.

VI. SOW Items 3 and 5: Perform conceptual study of potential customer service risk reduction, costs and benefits.

a. Provide a second 69 KV transmission interconnection with Delmarva Power.

b. Provide microgrid generation to mitigate system risks.

c. Provide electrical storage for limited use backup power and system stability when renewable resources are engaged.

d. Providing Time of Use (TOU) rates incents renewable generation and storage to provide peak shifting and microgrid opportunities.

VII. SOW Item 6: Provide a report and working session presentation of results from the SOW including upgrades identified in the SOW.

ALEXANDER M. GRIER, P.E.

Senior Project Manager

Mr. Grier joined the firm of George, Miles & Buhr, LLC (GMB) as Senior Project Manager for the Civil / Municipal Group in December of 2018. Prior to joining the firm, Mr. Grier was Sr. Vice President / Principal at Downes Associates, Inc., where he served as Chief Civil Engineer for more than 30 years. Mr. Grier has also served as the client representative / project manager for several projects.

Areas of Expertise Include:

- **Power plant refurbishing and construction projects** that involved installation, permitting, and building modification for reciprocating engine generator sets of capacity increases in the 2,000 KW to 3,000 KW range. These projects are located in Berlin, Maryland; Culpeper, Virginia; Seaford, Delaware; and Chambersburg, Pennsylvania.
- **Chief Project Engineer** for the design and construction services for a **new 23,000 KW electrical generation plant**, new substation and PJM interconnection for the Borough of Chambersburg, Pennsylvania.
- Team Leader for the **development of a software model** to provide operational revenue, cost, fuel consumption, operation and maintenance, and energy production data for proposed combustion turbines or reciprocating engine generators. Generation as a PJM network resource at any node with LMP data can be modeled and value compared.
- Supervising **electric system and generation studies for Public Power Utilities** in Delaware, Virginia, Pennsylvania, Connecticut, Massachusetts, and Florida.
- Leadership and Participation in **utility system study projects for municipal electric utilities** that evaluated growth potential, areas for development, system equipment, high priority and long-term needs, system protection and operation for distribution, transmission, and generation.
- Performing numerous investigations of small (<500 KW) run of river and reservoir outlet **hydroelectric projects** in Maryland, Delaware, Virginia, and Pennsylvania.
- Consulting services for five **offshore and land-based wind projects** and five **combined heat and power projects** based upon biogas fuel. Assisted in the preparation of interconnection studies with PJM for these projects.

RESPONSIBILITIES

Senior Project Manager: Engineering

GROUP

Civil / Municipal, Salisbury

EDUCATION

Bucknell University, 1976
Bachelor of Science
Civil Engineering

Bucknell University, 1976
Bachelor of Arts
Economics

REGISTRATION

Professional Engineer:
MD-13592
DE-8505
FL-61998
VA-0402021628
PA-PE040956R
NC-036596
NCEES-21337

ORGANIZATIONS

American Society of Civil Engineers (ASCE)

American Public Power Association (APPA)

Relevant Project Experience Includes:

- **Evaluation of Land-Based Facilities for 120 MW Offshore Wind,** *Ocean City, MD.* Investigated potential offshore wind energy transmission landing and connection to Delmarva Power 138 KV grid. Managed consultant's work on mapping with zoning, land use, wetland, and endangered species inventories, and evaluated horizontal boring use and cost to reach ocean to beach. Developed conceptual interconnection at existing and new substation based upon PJM interconnection rules and practices. Developed conceptual budget for interconnection, and prepared routing alternatives to avoid conflicts with existing utilities, roads, and rights-of-way.
- **Evaluation & Update to Power Supply/Generation Strategy Plan***, New Smyrna Beach, FL.* Provided electric system review and developed 20 MW gas fueled power plant concept and location on Commission property. Developed connection to existing substation and local gas pipeline. Reviewed potential revenue from generation operations and developed project budget. Presented to Commission report findings including recommendations for two existing reciprocating engine generating plants.
- **MIT Cogeneration Reliability Review,** *Cambridge, MA.* Performed a multi-phase reliability study of the electrical utility system on MIT campus, and reviewed conceptual design development of new 40 MW cogeneration facilities. Assessed suitability/reliability of conceptual design modifications to provide new combustion turbine generators with heat recovery system to provide for microgrid development on the MIT Campus. Investigated electric system connection and ability of staff to operate in island and parallel conditions.

CAROL E. MISTER

Senior Designer

Carol Mister recently joined George, Miles & Buhr (GMB) in December 2018 as Senior Designer. Prior to joining GMB, Carol was employed for over thirty years at Downes Associates, Inc. where she most recently served as Senior Designer/CAD System Administrator. Her primary responsibility was facilitating the engineering department project development and production.

RESPONSIBILITIES
Senior Designer

GROUP
Civil / Municipal, Salisbury

EDUCATION
Salisbury University
Liberal Studies
Bachelor of Arts

Areas of Expertise Include:

- Collection and utilization of various engineering resources to produce technical data to support engineering designs.
- Development of drawings for distribution and transmission line design, substation design, power plant design, and electrical system evaluation.
- Project support for offshore and land-based wind projects and preparation of interconnection studies with PJM for Bluewater Wind, Offshore MW, Skipjack Wind.
- Liaison between IT, engineering, outside consultants, and clients.
- Performing monthly client interval meter downloads and data conversion for analysis for Chambersburg PA, Thurmont MD, and Seaford DE.
- Drafting supervision, technical document review, and quality assurance.
- CAD system administration and maintaining company electronic data storage
- Development of client presentation and company advertising graphic design and production.

Relevant Project Experience Includes:

- **Evaluation of Land-Based Facilities for 120 MW Offshore Wind,** *Ocean City, MD.* Provided drawing coverage for each proposed corridor landing, duct bank, and substation using Google Earth Pro and AutoCAD. Provided project support for (a) review of map and photogrammetry to develop duct bank location; (b) review of rights-of-way and proposed alignment plotted focusing on the alignment for limitations presented by land use requirements, (3) the conceptual design for the interconnection facility, and (4) preparation of drawings for final presentation.
- **Electrical Interconnection for Biogas Facility***, Easton, MD.* Provided project support, coordination, and assisted in the design and development of electrical single line, plan, and profile drawings for a 10 MW industrial site with generation and distribution.
- **Pine Street Electrical Substation Expansion and Reconstruction,** *Seaford, DE.* Provided project support for substation expansion and relocation project. Assisted in the coordination and development of drawings, technical document review, design and submittal review, collection and development of project data, and final record drawings.
- **State of Maryland, Transmission Planning and Development of Interconnection Locations for Renewable Energy***, Annapolis, MD.* Developed planning drawings from study of the electrical utility system for potential locations for renewable generation. Worked with engineers to assess suitability of existing circuits throughout Maryland to accept development of sites. Provided report and participated in development of interactive website.
- **138 KV Transmission & Distribution Line Relocation***, Homestead, FL.* Project scope included engineering services for a major 138 KV transmission line with 12 KV underbuilt distribution line relocation project. Provided project support, coordination, and assisted in the design and development of plan and profile drawings.

SEAN M. KENNEDY

Geographic Information Systems (GIS) Specialist

Mr. Sean Kennedy joined the firm of George, Miles & Buhr in July of 2015. Sean is a Geographic Information Systems Specialist with the Civil/Municipal Group in the Salisbury Office. Previously Mr. Kennedy was a GIS Intern for the Public Works Department of Salisbury, Maryland. There he worked on government-funded GIS projects for the city of Salisbury, impacting approximately 90,000 residents and employees in the area. Mr. Kennedy digitized various physical maps, surveys, etc. in order to create greater access to recorded knowledge, easier analysis/application of records and ensure the preservation of historical records of data; responsibilities include digitizing, data collection, surveying/GPS, database management, cartography, and other spatial analyses.

Relevant Project Experience Includes:

- **Evaluation of Land-Based Facilities for 120 MW Offshore Wind**, *Ocean City, MD.* Provided desktop study services for an offshore wind project in Ocean City, Maryland. This project entailed reviewing previous project work related to landing and routing 138 KV and 230 KV transmission cables from offshore wind developments to interconnection with Delmarva Power and PJM. For a desktop study, major details were overlaid on a photogrammetric base drawing of the transmission corridor at 1" = 200 ft. The particular land use and ownership features were made as drawing layers from state and county databases to provide Skipjack Offshore Energy (Skipjack) with a preliminary detail of land-use features. The proposed right-of-way and approximately 200 ft. on either side were on the base drawing and overlaid using AutoCAD with the Skipjack requested features such as tax map parcels, zoning, wetlands, flood plain, etc.
- **Infrastructure Asset Management Program for MS4 Compliance**, *Seaford, DE.* Currently assisting the City with the 2nd phase of their Infrastructure Asset Management Program, compliance with the Environmental Protection Agency's (EPA) Stormwater Phase II Rule. This requires submitting a Notice of Intent (NOI) under Phase II MS4 General Permitting Program to receive an NPDES permit of authorization to discharge as an MS4 system. Prior to submitting this application, the City must take inventory and map the existing stormwater management infrastructure.
- **Water & Sewer System Assets Evaluation,** *Pocomoke City, MD*: Assisting the City with an evaluation of the water & sewer systems. GIS mapping includes collecting all water distribution and sewer collection maps that are available, digitize maps and create a base map, conduct field surveys to verify locations and collect missing data, and prepare a comprehensive map detailing the public water distribution system and sewer collection system.
- **Salisbury Storm Drain Inlet Study**, *Salisbury, MD*: As a GIS Intern with City of Salisbury Public Works Department, Mr. Kennedy conducted a storm drain inlet study, including locating storm drains with catch basin inserts using GPS, measuring rim elevations and grate size, and noting the condition of the insert. He then created a GIS layer from the location data collected to overlay with the rest of the City's storm drain system. Fields that were linked with the GIS layer included inserted number (assigned as collected), grate size, year of installation (if known), date of visual inspection, and apparent condition at time of inspection.
- **Seaford WWTF Sea Level Rise Vulnerability**, *Seaford, DE*: The Vulnerability Study includes survey, mapping, and inventory elements for the City of Seaford's WWTF located along the Nanticoke River. The Delaware Coastal Programs Map shows major portions of the facility will be inundated at a 1.5 meter sea level rise.

RESPONSIBILITIES
GIS Specialist

GROUP
Civil / Municipal, Salisbury

EDUCATION
Salisbury University 2015
Bachelor of Science in Geography and Geosciences

ORGANIZATIONS
Salisbury University Geo-Society

CRISFIELD SUBSTATION 69 KV BUS TIE

Crisfield, Maryland

CLIENT
Pepco Holdings Inc.
701 Ninth Street, NW
Washington, DC 20068

SERVICES
Civil Engineering
Seaford

COMPLETION DATE
Engineering 2017
Construction Pending

CONTACT
Mr. Mousa Hejazi, P.E.
(202) 872-2842

George, Miles & Buhr (GMB) provided professional engineering services to Pepco Holdings Inc. (PHI) for the underground transmission line work for the 69 kV Bus Tie project located within the Crisfield Substation.

This project involved the installation of underground conduit between two proposed overhead structures. The underground portion consisted of solid dielectric cable in a four-way duct bank with four 8-inch diameter PVC conduits, as well as two 4-inch diameter PVC conduits.

GMB provided the following services for this project:

- Site visits and survey
- Soil borings
- Preparation of plan and profile drawings (per PHI drawing standards) for the transmission line
- Preparation and submittal of Maryland Department of Environment permit for construction dewatering

GMB will provide the following construction services:

- Construction stakeout
- As-built survey
- As-built drawings

DELMARVA POWER PROJECTS

Various Delmarva Locations

CLIENT
Delmarva Power
PO Box 1739
Salisbury, MD 21802

SERVICES
Civil Engineering
Structural Engineering

CONTACT
Mr. Neil Baker, Supervisor, Real Property
410-860-6570

Fuel Island Replacement

GMB assisted Delmarva Power with the conversion of their Centreville, Maryland truck fueling facility to emission-reducing biodiesel fuel. GMB evaluated three (3) alternative locations for the replacement fueling, prepared the storm water management (SWM) plan, coordinated the subsurface soil and groundwater investigation for both the existing storage tanks and proposed fueling system, and completed the engineering drawings for the replacement facility. GMB also provided shop drawing review and construction administration services.

Centreville Facility Expansion Feasibility Study

GMB provided engineering services for preliminary planning and code review for incorporation of additional land into the Delmarva Power Centreville Facility. On a compressed schedule, GMB was able to develop preliminary site plans with layout alternatives, planting plans to meet the Town of Centreville tree ordinance, and preliminary SWM plans, in order to obtain Conditional Site Plan approval to assure Delmarva Power the legitimacy of the intended site use prior to settlement. GMB also coordinated with the Delmarva Power Real Estate Division and their land use attorney in order to modify business park covenants.

Emergency Generator and Transfer Switch

GMB designed a new emergency generator and transfer switch to replace the existing portable generator at the Delmarva Power Millsboro, Delaware location. GMB administered construction services provided by Tomey Electric. Scope of work entailed:

1. Site visit to determine size of existing generator and transfer switch.
2. Determine existing, and future, loads required for the new emergency generator and automatic transfer switch.
3. Determine the proper size for the new emergency generator and automatic transfer switch.
4. Determine the approximate location for the new equipment based upon the future fuel cell island project.
5. Provide recommendations regarding sizing, and location, of the new generator and transfer switch.

Roof Damage Assessment

GMB performed a structural evaluation of a snow damaged roof at a Delmarva Power building in Harrington, DE. The scope of work included a site visit, letter report of findings, and recommended repairs illustrated with hand-drawn sketches.

UNDERGROUND TRANSMISSION DESIGN
OCEAN BAY SUBSTATION TO ST. MARTIN'S NECK SWITCH STATION
Ocean City, Maryland

CLIENT
Pepco Holdings Inc.
701 Ninth Street, NW
Washington, DC 20068

SERVICES
Civil Engineering
Seaford

COMPLETION DATE
2018

CONTACT
Ms. Sara Lacey, P.E.
(202) 872-2977

George, Miles & Buhr, LLC (GMB) provided engineering services to Pepco Holdings Inc. for the replacement of 138 kV high-pressure fluid filled cable terminations, the pumping plant, and the cathodic protection system located at both the Ocean Bay Substation and the St. Martin's Neck Switch Station.

The scope of work for this project consisted of researching permitting requirements and the preparation of documents for all the permits required for the project. GMB coordinated and worked closely with the contractor/design to determine information required for the permitting process. GMB prepared the site plan, erosion and sediment control plans, and critical area drawings as required for the permits.

Bi-weekly teleconferencing meetings were conducted during the design phase, and weekly teleconferencing meetings were conducted during the construction phase. Additionally, GMB attended on-site construction meetings and meetings with the permitting agencies during the permitting process.

OCEAN CITY UNDERGROUND TRANSMISSION LINE

Ocean City, Maryland

CLIENT

Exelon Co./Pepco Holdings
701 Ninth St. NW
Washington, DC 20068

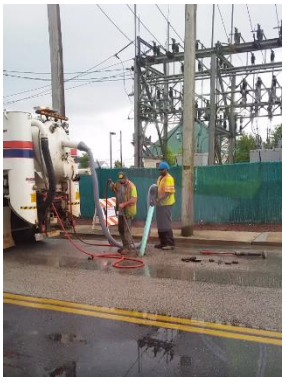
SERVICES

Civil Engineering
Construction Phase Services

CONTACT

Mr. Afshin Avvali, P.E.
Mr. Mousa Hejazi, P.E.
202-872-2842

GMB provided civil engineering services for an underground 69kV transmission line built from the Ocean City Substation to a riser structure on the west side of Wight Bay at Seaside Village, continuing as an overhead circuit to the Worcester Substation. The project included a horizontal directional drill (HDD) of a 38-inch conduit with 54-inch bore hole across Isle of Wight Bay. Services included survey, utility location, plans and profiles/details and transmission line (TL) drawings, permitting, construction stakeout, preparation of traffic control plans, and construction stakeout and as-builts.



The project had an aggressive schedule in terms of permitting. GMB's relationships with many of the regulators assisted in meeting the schedule for the permit acquisition phase of the project. The project was completed in a resort area and as such had demanding requirements in terms of scheduling around the resort season, communication with the public and restricted work areas.

There were minimal conflicts with existing utilities encountered during completion of the work.

GMB's role during the construction phase expanded to include several services which were not included in its original scope. These included noise, vibration, and settlement monitoring and bathymetric survey. GMB was able to provide these services quickly and efficiently. Also, there were several frac-out events associated with the HDD that GMB was able to assess and coordinate a remediation effort with the regulators.

INFRASTRUCTURE ASSET MANAGEMENT PROGRAM

Seaford, Delaware

GMB provided engineering services required for the development of an Asset Management Plan for the City of Seaford's water and wastewater infrastructure, in accordance with grant applications filed with the Delaware Department of Natural Resources & Environmental Control (DNREC) and the Office of Drinking Water (ODW).

GMB worked closely with the Eastern Shore Regional GIS Cooperative (ESRGC) on the GIS portion of this effort. The water and sewer inventory was completed in 2018.

CLIENT
City of Seaford
414 High Street
Seaford, DE 19973

SERVICES
Grant Assistance
GIS Mapping
Asset Planning

COMPLETION DATE
Water/Sewer – 2018
Stormwater - Ongoing

CONTACT
Mr. Charles D. Anderson
302-629-9173

GMB's services included:

- Asset Inventory and Condition Assessment
  - a. GIS Mapping
  - b. Vertical Assets Inventory
    - Water System
      - i. Well / Water Pump Stations (5 total)
      - ii. Elevated Water Storage Tanks (4 total)
    - Wastewater System
      - iii. Lift Stations (14 total)
      - iv. Wastewater Treatment Facilities (14 process tanks, 8 pump sets)
      - v. Biosolids Composting Facilities
  - c. System Inventory Worksheets
- Level of Service Statements
- Asset Criticality Assessment
- Life Cycle Cost Analysis
- Long-Term Funding Plan
- Report Preparation / Public Presentation

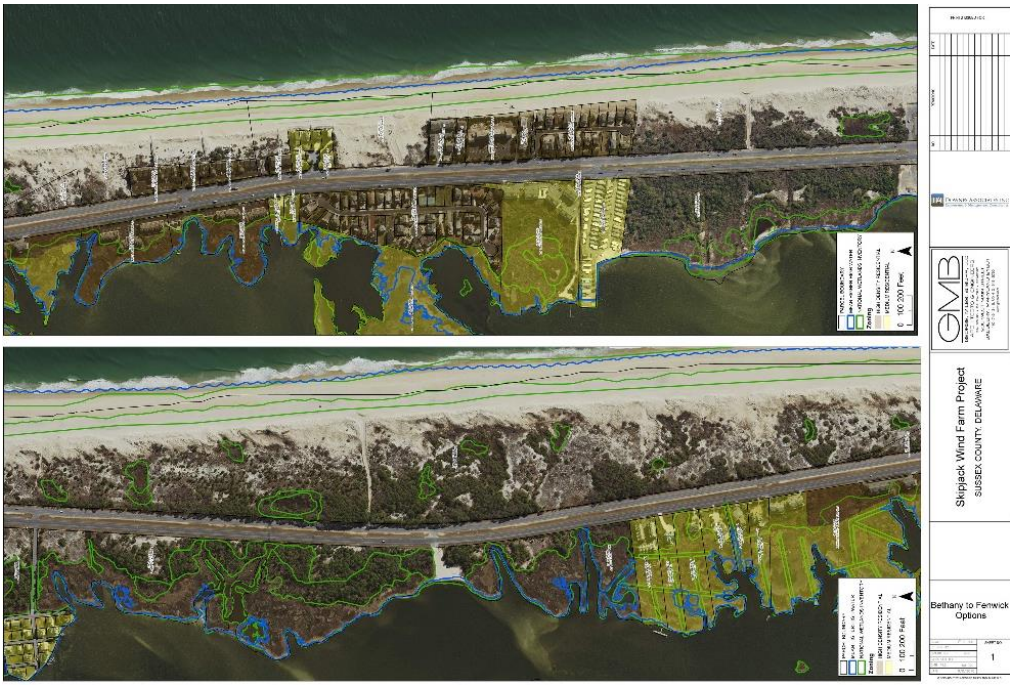
GMB is currently assisting the City with the next phase of this effort, compliance with the Environmental Protection Agency's (EPA) Stormwater Phase II Rule. This requires submitting a Notice of Intent (NOI) under Phase II MS4 General Permitting Program to receive an NPDES permit of authorization to discharge as an MS4 system. Prior to submitting this application, the City must take inventory and map the existing stormwater management infrastructure.

GMB's services under this effort includes:

- Review City provided as-builts and/or construction drawings of existing stormwater infrastructure and confirm locations in the field.
- Perform field investigation to track the existing stormwater infrastructure system consisting of outfalls, manholes, and catch basins for creating a master stormwater map and cataloguing the various pipe sizes and materials.
- Quantifying the amount of storm sewers, manholes, catch basins, outfalls, open ditches/tax ditches, retention basins, and detention basins.
- Identify potential sites for implementing future green stormwater management Best Management Practices (BMP's).
- Provide map data in a shape file format to the State data plan.
- Provide a final report, which will include a project description, master stormwater map, and a summary of the stormwater management infrastructure properties observed in the field., i.e. pipe material, size, etc.

EVALUATION OF LAND-BASED FACILITIES FOR 120 MW OFFSHORE WIND

Ocean City, Maryland



OWNER
Skipjack Offshore Energy, LLC
Ocean City, Maryland

SERVICES
Civil Engineering
GIS

COMPLETION DATE
2018

CONTACT
Mr. Steven Simkins
978-518-0456

George, Miles & Buhr, LLC (GMB) was subcontracted by Downes Associates, Inc. to provide desktop study services for an offshore wind project in Ocean City, Maryland. This project entailed reviewing previous project work related to landing and routing 138 KV and 230 KV transmission cables from offshore wind developments to interconnection with Delmarva Power and PJM.

GMB reviewed the cable landing site and options for the transmission line routing to the selected delivery point. GMB provided preparation of the primary route and alternative roadway survey associated with proposed Skipjack 120 megawatt (MW) offshore windfarm shore landing, upland cable route, and interconnection facility locations. GMB provided desktop study services which provided detail on the landfall approaches in Delaware.

Using up-to-date horizontal boring methods to land offshore conductors, GMB reviewed potential route for the conductor cable in concrete duct banks along existing right-of-way and state or federal controlled land or waterway.

For a desktop study, major details were overlaid on a photogrammetric base drawing of the transmission corridor at 1" = 200 ft. The particular land use and ownership features were made as drawing layers from state and county databases to provide Skipjack Offshore Energy (Skipjack) with a preliminary detail of land-use features. The proposed right-of-way and approximately 200 ft. on either side were on the base drawing and overlaid using AutoCAD with the Skipjack requested features such as tax map parcels, zoning, wetlands, flood plain, etc.

The landing area was investigated and likely parcels suitable for the drilling work were identified and notes made for management review. The landing was suitably connected to the right-of-way and an initial duct bank alignment drawn to property near or adjacent to the named substations for interconnection. Commentary was provided regarding the physical features and the reasonable opportunity to connect.

Final PJM interconnection at the substation will be determined and designed by Delmarva Power. The final product of this desktop study provided a 24" x 36" format drawings and report containing an order of magnitude budget and feasibility assessment for Skipjack management. Other routes which seemed promising were identified for further investigations by Skipjack.

SUSSEX SHORES UNDERGROUNDING UTILITIES & ROADWAY IMPROVEMENTS

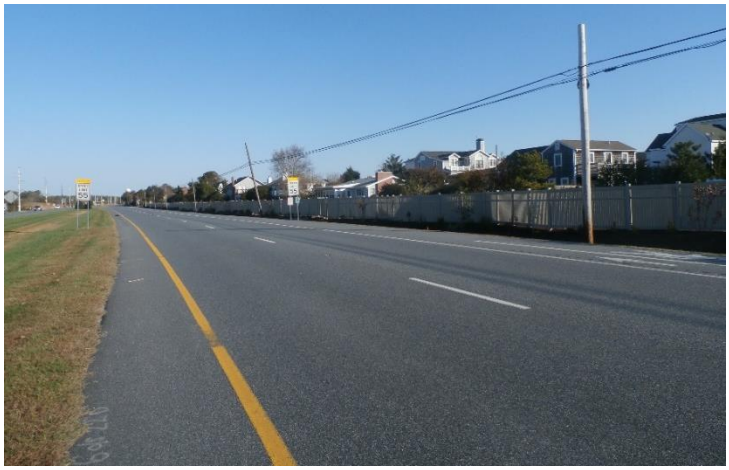
Bethany Beach, Delaware

GMB provided design phase services necessary for the undergrounding of overhead utilities within the Sussex Shores community north of Bethany Beach, Delaware. The undergrounding work included ductbank installation necessary for the relocation of Delmarva Power electric lines, Verizon communication lines, and Mediacom cable TV lines; road repaving; drainage improvements and miscellaneous work associated with undergrounding third-party owned utilities.

Various sizes of PVC and HDPE conduit were installed within the roadways of the Sussex Shores Community. The conduit consists of approximately 13,942 LF of 4" diameter rigid PVC; 1,589 LF of 3" diameter rigid PVC; 24,446 LF of 2" diameter HDPE; and 7,352 LF of 1" diameter HDPE. Roadway trench restoration with crusher run was also included as part of the scope of work.

GMB's services included performing survey work; preparation of base map; coordination of designs by Delmarva Power, Verizon and Mediacom; preparing construction documents (plans, specifications, bidding documents), making permit applications based upon the design concept accepted by Sussex County, as well as Contract Administration & Inspection services. In addition, GMB participated in a Value Engineering process arranged by Sussex County.

Under separate contract, GMB also aided with roadway improvement design and construction administration services. This work consisted of pulverization of existing paving, roadway excavation, installation of 11,550 square yards of recycled bituminous base course, 11,550 square yards of bituminous asphalt base and surface paving, installation of 60 CY of riprap swales, edge of roadway transitions and installation of rubber speed humps.



CLIENT

Sussex County, Delaware
2 The Circle
PO Box 589
Georgetown, DE 19947

SERVICES

Civil Engineering
Contract Administration & Inspection Services
Seaford

COMPLETION DATE

2017

CONTACT

Mr. Joseph Wright, P.E.
(302) 855-7730

SUB-CONSULTANT QUALIFICATIONS

For specific elements of this project, the City will be best served by GMB's collaboration with specialized consultants. We have included resumes and additional information on the following pages. We are confident that these firms will provide exceptional work for the City of Lewes Board of Public Works.

- **Preston Waller & Associates, Inc. (PWA)** is an electrical engineering firm located in Salisbury, MD. The firm, led by President S. Jay Waller, P.E., was established in 2002 and incorporated in 2008. The firm maintains Professional Engineering licensure in Maryland, Delaware and Pennsylvania. PWA's focus is on supporting the needs of municipal electrics and large industrial power systems.

- **Smart Utility Management, LLC (SUM)** was founded by Christopher S. Simms in December 2018 in order to continue providing retail rate, budgeting, and regulatory consulting services for municipal electric utilities when the partners at his former place of employment, Downes Associates, Inc., retired and ceased operations. Mr. Simms is currently the principal and sole proprietor of Smart Utility Management, LLC.

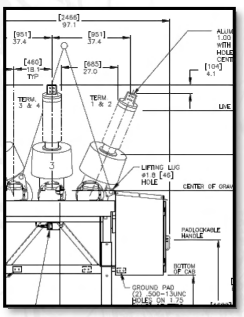
Preston Waller & Associates, Inc.

S. Jay Waller, PE President
4510 Coulbourn Mill Road
Salisbury, MD 21804
410-546-2861

- Located in Salisbury, MD.
- Established in 2002 and Incorporated in 2008.
- Professional Engineering licensure in Maryland, Delaware and Pennsylvania.
- Focus on supporting the needs of municipal electrics and large industrial power systems.
- Provide specialized support to other Engineering firms in need of our expertise.

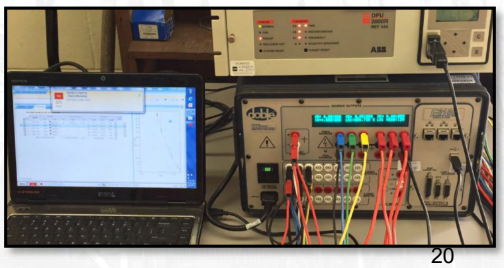
- Transmission and distribution power system studies
  - Power flow and short circuit
  - Protective relay coordination
  - Feasibility, contingency, and long range analyses

- Distribution engineering services
  - Distributed energy resource integration/microgrid
  - Volt/var/power factor analysis and management
  - Equipment specification and selection



- Transmission and substation engineering services
  - Equipment specification and selection
  - Modifications and upgrades
  - Construction inspection

- Automation and communications
  - Substation automation/SCADA
  - Distribution automation



- Equipment Maintenance Services

S. Jay Waller, P.E.

Experience

Senior Engineer September 2010 – Present
Preston Waller & Associates, Inc., Salisbury, MD

- Perform substation engineering with focus on equipment additions and replacements.
- Perform substation and generator protection, controls, and SCADA engineering activities.
- Perform engineering assessments of substation apparatus and prepare recommendations.
- Perform power system reliability assessments and provide recommendations.
- Provide operations support and process recommendations for industrial power systems.

Senior Engineer May 2007 – September 2010
Downes Associates Inc., Salisbury, MD

- Managed and levelize electrical staff workload
- Managed field technical support staff commitments and coordinate client needs with staff commitments.
- Performed NERC compliance activities for clients including procedure and process map development as well as preparation of compliance self certification information.
- Prepared fixed fee proposals and manage project cost, schedule, and scope.
- Performed T/D substation and generator protection, controls, and SCADA engineering activities.
- Performed engineering assessments of substation apparatus and prepare recommendations.

Senior Engineer June 2005 – May 2007
Progress Energy Carolinas – System Operations, Raleigh, NC

- Performed weekly system reliability studies to support NERC compliance during transmission maintenance activities.
- Performed semi-annual system reliability studies to determine system critical outages and recovery plans.
- Performed nuclear plant LOCA grid voltage studies.
- Wrote and updated system operations procedures.

Senior Engineer February 2004 – June 2005
Engineer June 2001 – February 2004
Progress Energy Carolinas – Transmission Maintenance, Oxford, NC

- Supported day-to-day engineering requests of substation and relay maintenance personnel.
- Identified and worked to resolve transmission customers' power quality issues.
- Wrote testing guidelines for generator and transmission line protective equipment.
- Engineered control and protection modification packages.
- Participated in on-call and storm-duty responsibilities.

Engineer March 2001 – June 2001
Associate Engineer August 1999 – February 2001
Carolina Power and Light, Roxboro Steam Electric Plant, Semora, NC

- Managed balance-of-plant substation installations.
- Supported environmental compliance project electrical system modifications.
- Requested capital funding for balance of plant improvement projects.
- Served as plant liaison to transmission department.

Education

Drexel University, Philadelphia, Pa
Bachelor of Science, Electrical Engineering, June 1999

Reference List for Preston Waller and Associates, Inc.

as requested by Lewes, DE RFI Request Issued March 11, 2019

Client: Borough of Chambersburg, PA

Contact: Jeff Heverley, Assistance Electric Superintendent; 717-251-2418

Services Performed:

- Analysis of transmission/distribution network for load flow/capacity
- Transformer/breaker sizing
- Protective relay coordination studies
- Integration of renewable energy resources
- Integration of distributed generation
- Upgrading of substation/transmission systems to improve reliability

Client: Town of Thurmont, MD

Contact: Jim Humerick, Chief Administrative Officer; 301-271-7313

Services Performed:

- Analysis of transmission/distribution network

Services Performed for Downes Associates, Inc.:

- Analysis of transmission/distribution network for load flow/capacity
- Transformer/breaker sizing
- Protective relay coordination studies
- Upgrading of substation/transmission systems to improve reliability

Client: City of Seaford, DE

Contact: Bill Bennett, Director of Electric; 302-629-9841

Services Performed:

- Protective relay assessment/NERC compliance activities
- SCADA integration services

Services Performed for Downes Associates, Inc.:

- Analysis of transmission/distribution network for load flow/capacity
- Transformer/breaker sizing
- Protective relay coordination studies
- Upgrading of substation/transmission systems to improve reliability

Client: City of Smyrna, DE

Contact: Bill Evans, Electric Director; 302-653-3493

Services Performed for Downes Associates, Inc.:

- Analysis of transmission/distribution network for load flow/capacity
- Protective relay coordination studies

PROFESSIONAL QUALIFICATIONS

Christopher S. Simms
Principal

Educational Experience

Mr. Simms obtained a Bachelors Degree in Business Administration, Economics, and Mathematics from McDaniel College (formerly Western Maryland College) in 2006. Mr. Simms graduated with the distinction of high honors and is a member of the Phi Beta Kappa Honors Society.

Mr. Simms obtained a Master of Business Administration from the AACSB accredited Perdue School of Business at Salisbury University in 2013. Mr. Simms is a member of the Beta Gamma Sigma international scholastic honor society recognizing outstanding performance in business.

Mr. Simms has attended professional educational seminars for Cost of Service & Retail Rate Design training.

Work Experience

Mr. Simms started Smart Utility Management, LLC in December 2018 in order to continue to provide retail rate, budgeting, and regulatory consulting services for municipal electric utilities when the partners at his former place of employment, Downes Associates, Inc., retired and ceased operations. Mr. Simms is currently the principal and sole proprietor of Smart Utility Management, LLC.

Mr. Simms worked for Downes Associates, Inc. from 2006 to 2018 and served in the capacity of Financial Analyst, Senior Financial Analyst, and Supervisor of Power & Financial Services. Mr. Simms performed numerous highly complex, qualitative/quantitative analyses, power market business rules, regulatory, & legislative research, and load survey data acquisition and management services. Mr. Simms also testified as an expert witness on many occasions before the Maryland Public Service Commission.

Mr. Simms performed analyses in power supply costs, power plant economics, electrical generation cost, power supply planning, power supply negotiations, transmission access, transmission tariff analyses, third party supply, and power supply risk analyses. Mr. Simms performed numerous retail rate studies, retail rate design, revenue requirement analyses, cost of service studies, and provided testimony regarding retail rates to the Maryland Public Service Commission referenced above.

Mr. Simms was responsible for analysis and development of forecasts, estimates, and projections regarding costs, revenues, and margins associated with various power supply, generation, and financial proposals affecting the benefit/advancement of municipal electric power departments. Mr. Simms studied multiple complexities within PJM Interconnection business rules, tariffs, and agreements in order to preserve all available wholesale power supply value for municipal utilities.

Prior to his work with Downes Associates, Inc., Mr. Simms worked for Booz Allen & Hamilton where he updated, tracked, and monitored the budgets for several multi-million dollar contracts. Mr. Simms also worked and managed alongside his father in the family automobile business.

SUM SMART UTILITY MANAGEMENT / LLC
Rates / Budgeting Σ Regulatory Consulting

Chris Simms

Principal

Experience

2006 - 2018 with Downes Associates

Education

MBA, Business Administration, 2013
Perdue School of Business
Salisbury University, Salisbury MD

BA, Business Administration, Economics, and Mathematics, 2006
McDaniel College, Westminster MD

Additional training includes:
Seminars for Cost of Service and Retail Rate Design

Phone

(410) 251-0526

E-Mail

chris@smartutilitymgmt.com

Address

5 71st Street Suite 301
Ocean City, MD. 21842

Summary of 12 Years Work Experience with City of Seaford

1. **PCAC Levelization & Monitoring**
   a. Preparation of PCAC Monitoring worksheet to track over and/or under collection of power supply costs
   b. Levelized the PCAC in accordance with the City's Ordinance

2. **Fiscal Year Electric Budget Forecasting**
   a. Estimate the Fiscal Year Gross Operating Margin ("GOM") for the City's electric department
   b. Normalize retail sales and revenues as well as wholesale purchases
   c. Includes rate design when desired

3. **Retail Rate Design and/or Maintenance**
   a. Modernize retail rates to parallel current standards and practices
   b. Quantify retail rate impacts to both limit individual customer impacts and maintain or improve the City's competitive posture with other utilities via retail rate comparisons
   c. Design rates to protect the City's GOM from disruptive technologies (i.e. - solar and other renewable resources)
   d. Verify retail rate reclassifications
   e. Update the City's Schedule of Fees and Rates

4. **Electrical Rules and Regulations Development**
   a. Maintain Rules and Regulations to be compliant with DE laws
      - Assisted with City's Net Metering and Demand Response policies

Additional services provided for other Municipalities

5. **Cost of Service Studies**

6. **EIA-861 and other Required Regulatory Reporting**

7. **PJM Participation**
   a. CAM Administration of PJM accounts
   b. CSP assistance for Demand Response participants
   c. Participation in PJM Stakeholder Process
   d. RPM Auction and ARR Auction assistance

8. **Wholesale Power Supply RFP's & Procurement**

PROFESSIONAL QUALIFICATIONS

David V. Downes, P.E.
Consultant

Educational Experience

Mr. Downes received a Bachelor of Science degree in Electrical Engineering from the University of Maryland. He also received a Bachelor of Arts degree in Biology from Western Maryland College. Mr. Downes has subsequently completed post graduate work in accounting, business system design, assessment of technology, energy conservation, and cost analysis plus numerous seminars and professional development courses in project risk analysis, cogeneration, energy management, electrical testing, high speed broad band telecommunications, and energy conservation.

Work Experience

Mr. Downes was CEO and Principal of Downes Associates, Inc. with more than 40 years of work experience consulting for municipal electric utility companies. Mr. Downes has testified as an expert witness on many occasions before the Delaware Public Service Commission, Maryland Public Service Commission, Pennsylvania Public Utility Commission, Federal Energy Regulatory Commission, and Federal Communications Commission. Mr. Downes has analyzed and negotiated interchange, wheeling, standby maintenance, and avoided costs rates and participated in P.U.R.P.A. and deregulation proceedings. Mr. Downes has performed analyses in power supply costs, power plant economics, electrical generation cost, alternate fuels, power supply planning, power supply negotiations, transmission access, transmission tariff analyses, third party supply, and power supply risk analyses. Mr. Downes has performed numerous retail rate studies, retail rate design, revenue requirement analyses, cost of service studies, and provided testimony regarding retail rates to numerous bodies as referenced above.

Previous experience as a design and project engineer includes various system designs and management projects. Project areas have included energy conservation analysis, energy system designs, and electric tariff cost analysis and design of cost of service studies for electric utilities.

Mr. Downes has also spoken at numerous energy seminars and consults with many local industries, utilities, and non-profit groups on a variety of energy matters.

Mr. Downes is a member of the Institute of Electrical and Electronics Engineers (IEEE), Maryland Society of Professional Engineers (MSPE), the National Society of Professional Engineers (NSPE), and the American Public Power Association (APPA). Mr. Downes is also a charter member of the local American Institute of Plant Engineers (AIPE) chapter and a member of the Association of Energy Services Professionals (AESP).

Mr. Downes is a registered Professional Engineer in the states of Maryland and Delaware.

Mr. Downes is Board Member of the Salisbury Christian Shelter, Chesapeake Housing Mission, and past Chairman of the Wor-Wic Community College Foundation.