955 Jefferson Avenue
Valley Forge Corporate Center
Norristown, PA 19403-2497

VIA FEDERAL EXPRESS
Confidential

July 29, 2009

Mr. Bruce Maillet
Charleston Clean Energy, LLC
12 Greenway Plaza, Suite 1100
Houston, TX 77046

Dear Bruce

CHEMICAL 138kV 2 MW (V1-023) FEASIBILITY STUDY

Attached is a report documenting the results of the Chemical 138kV (V1-023) Feasibility Study. The results of this Feasibility Study are predicated on a year 2013 transmission system based upon PJM's best assumptions at the present time for load growth and connection of proposed new generation additions. The project was evaluated for system normal conditions and single contingency outage conditions. In addition, tower line outages, which are anticipated to have a significant cost or timing impact on the interconnection of the project, were assessed. Short circuit analysis was performed and stability analysis was not performed.

Feasibility studies are performed to provide the generation developer with ballpark reinforcement cost and timing information concerning both direct connection facilities and potential transmission network upgrades. The analysis inherently has to include assumptions regarding existing uncertainties; therefore, the results should be used in this context.

Pursuant to Section 204 of the PJM Tariff, enclosed is a copy of an Impact Study Agreement for your consideration. The Agreement must be executed within thirty days **(by close of business on August 31, 2009)** to maintain the project's position in the queue. In order to expedite initiation of the Impact Study, please provide the information requested on this link, http://www.pjm.com/planning/form-impact-study-data.html, and submit it electronically. We will need this information by **August 31, 2009.**

Two interconnection options were described in the Feasibility Study report. You must provide PJM with your chosen interconnection option when the Impact Study Agreement is returned.

The cost for the Feasibility Study is being tabulated and you will receive an invoice in the near future.

The following information is provided for wire transfers: Bank: PNC Bank, NA, New Jersey; ABA Number: 031-207-607; Account Number: 8013589826. Please e-mail Jeannette Mittan at mittaj@pjm.com with the project name, queue number, date and amount of wire.

Sincerely,

John W. Fedorko
Sr. Consultant/Engineer
System Planning Department

JWF\nbm #551968
Attachments

cc: Via U.S. Mail (w/attachment):
Craig Lockwood – AEP

PJM Office of the Interconnection (w/attachment):
Rob Price - PJM

PJM Generator Interconnection Request
Queue #V1-023
Chemical 138kV
Feasibility Study

551914

July 2009

Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, may also contribute to the need for the same network reinforcement. The possibility of sharing the reinforcement costs with other projects may be identified in the feasibility study, but the actual allocation will be deferred until the impact study is performed.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners,

V1-023 Chemical 138kV Feasibility Study Report

General

Charleston Clean Energy, LLC is proposing to install 2 MW of generation at the City of Charleston Landfill with the capability of future expansion up to 3.3 MW. Methane gas from the landfill will be utilized as the generation fuel type. The equipment configuration will consist of 2 - G.E. Jenbacher JGS-320-CG-L.L engines with Stamford PE 734 B2 generators initially with a provision for 1 future G.E. Jenbacher JGS-420-GC-L.L engine with Stamford PE 734 B2 generator.

The proposed location of the generating facility is 741 South Park Road, Charleston, WV which is adjacent to two transmission lines and in proximity to a 12 kV distribution line. Both a 138 kV and a 46 kV circuit run approximately 500 feet from the proposed interconnection point (figure 1), but it was determined that only the 46 kV interconnection option will be investigated by transmission at this time due to the anticipated higher cost to connect at 138 kV as Option #1. Also, a 12 kV circuit which runs east of the Charleston landfill disposal area is being considered as a possible interconnection option which has been evaluated by AEP Distribution Planning as Option #2.

Attachment Facilities

Option #1 – Chestefield Ave-Ward Hollow 46kV circuit

The attachment facilities for the 46 kV transmission option consist of an in-line switching station at or near the Chesterfield Avenue-Ward Hollow 46 kV circuit approximately 1 mile from Chesterfield Avenue. The new in-line station will consist of three (3) breakers arranged in a ring bus configuration (figure 2).

Construction scope for the attachment facilities:

- Line estimates include installation of two (2) dead end structures between structures 374-8 and 374-9 on the Chesterfield Avenue-Ward Hollow 46 kV circuit.
    - Note: This estimate is to facilitate an “in-line” station. Any movement of the proposed station off of the existing centerline would require additional structures and therefore add to the cost.
        - Estimated Cost: **$320,000**
- Station estimates include three (3) 69 kV breakers, 69 kV bus work, fiber optic termination, line relaying, control house, land improvement (assuming significant

grading), station service, station battery, shield poles, RTU, metering, control cable, engineering and labor.

- Note: This estimate does NOT account for any land purchases. Station design has requested at least a 200' x 200' parcel will be needed from Charleston Clean Energy.

  - Estimated cost: **$2,980,000**

  - Total (preliminary) estimated cost: **$3,300,000**

Option #2 – Interconnect to the South Park 12kVcircuit

The project will be connected to the Bridge-South Park 12kV circuit that is connected to the 69-12 kV, Bridge Station which is served from the Capitol Hill-Chesterfield 69 kV line.

The proposed interconnection will require the following improvements:

- Reconductor approximately 8,000 feet of the existing 12kV distribution circuit with 4/0 AA primary and 1/0 AA neutral.
- Upgrade 3-100T fuses at the tap the Charleston Landfill with a 400Amp. Viper Recloser and SEL 651R control.
- Install 12kV primary metering.
- Install 2.2 miles of fiberoptic cable for communication purposes.
- Reprogram the CL-6A controls on the station bus regulators for bi-directional regulation.

The total (preliminary) estimated cost of the improvements is **$521,200**.

If the project is connected to the distribution system, AEP expects there will be a distribution wheeling charge, however, it needs to be calculated on an individual case based upon the distribution facilities used. This cost will be calculated and included in the Impact Study report.

Local Network Upgrades

The impact of the proposed generating facility on the AEP System was assessed for adherence with applicable reliability criteria. AEP planning criteria require that the transmission system meet single contingency performance criteria in accordance with the AEP FERC Form 715. Therefore, this set of criteria was used to assess the impact of the proposed facility on the AEP System. This project was studied as a 2.0 MW net energy injection consistent with the interconnection application. The interconnection project was studied at full capacity. The results are summarized below.

The Charleston Clean Energy project (queue V1-023) was evaluated at capacity of 2.0 MW. The generation was modeled in-between Chesterfield Avenue and Loudendale 46 kV stations on the

Chesterfield Avenue-Ward Hollow 46 kV circuit for the transmission option. A 2013 summer study case was used to determine if any violations were caused by the additional generation.

The local network impacts are the same for either interconnection option.

Normal System (2013 Summer Conditions)

- No problems identified.

Single Contingency (2013 Summer Conditions)

- No problems identified.

Double Contingency (2013 Summer Conditions)

- No problems identified.

Short Circuit Analysis

- No problems identified.

Local Network Upgrades

- No Local Network Upgrades are needed.

Network Impacts

The queue V1-023 project was studied as a 2.0 MW (capacity) injection at the Chesterfield Ave 138kV substation. Project V1-023 was evaluated for compliance with reliability criteria for summer peak conditions in 2013. Potential network impacts were as follows:

Generator Deliverability
(Single or N-1 contingencies for the Capacity portion only of the interconnection)

No problems identified.

Multiple Facility Contingency
(Double Circuit Tower Line, Line with Failed Breaker and Bus Fault contingencies for the full energy output)

No problems identified

Short Circuit

No problems identified.

Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

No problems identified.

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)

None

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)
(Summary form of Cost allocation for transmission lines and transformers will be inserted here if any)

None

Figure 1

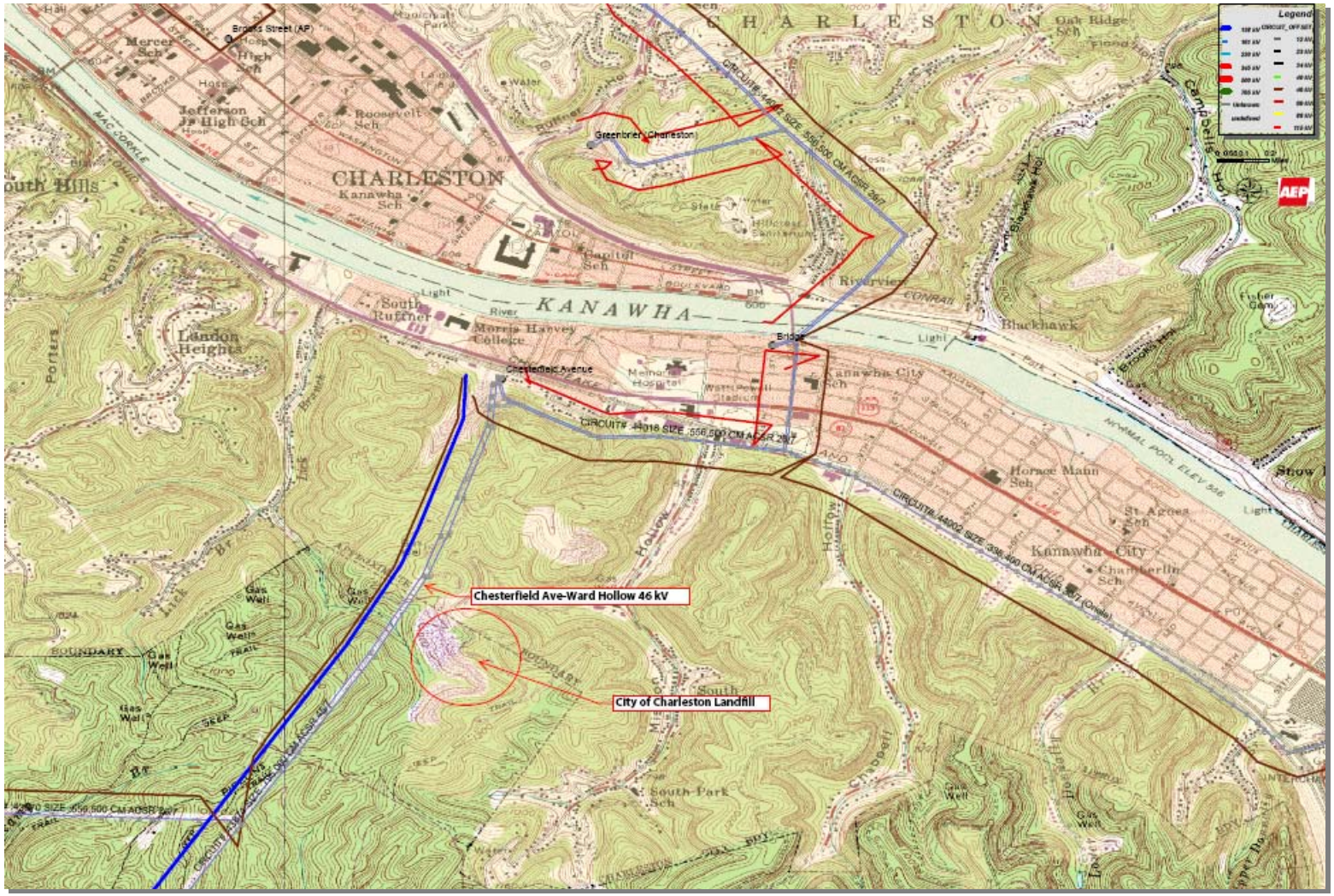
Chesterfield Ave-Ward Hollow 46 kV
City of Charleston Landfill
CHARLESTON
KANAWHA
Legend

Figure 2