

WESTERN WAKE PARTNERS

Report to the Policy Advisory Committee (PAC09-26)

Date: September 29, 2008
To: Western Wake Partners
From: Tim Bailey, P.E., Director of Engineering, Town of Cary
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Subject: Selection of Power Vendor for Beaver Creek Pump Station

Background:

In February 2007, the Town of Apex was selected as the electric power vendor for the Western Wake Water Reclamation Facility. Proposals were received from Progress Energy and the Town of Apex. After a thorough review process, the Town of Apex was selected. Factors considered in the selection included the following: Apex's willingness to install redundant transformers onsite, their ability to respond quickly to power outages, their support as a wastewater system operator, their emergency operations agreements with seventy-three other municipal electric utilities in NC, and their offering of cost option plans to reduce peak demand costs.

Following on the original proposal, Apex submitted a similar proposal for the extension of power to the Beaver Creek Pump Station. The proposal submitted by Apex follows on the same format and benefits that contributed to their selection as the power vendor for the Western Wake Water Reclamation Facility.

Hazen and Sawyer analyzed the proposal from the Town of Apex to provide electric service to the Beaver Creek Pump Station. An overview of the proposal and utility service recommendations are summarized below.

Proposed Facilities

The Town of Apex is proposing to supply electric power to the Beaver Creek Pump Station from a new substation (Southwest Apex Substation). This substation does not exist at the time of this report, however, it is anticipated to be in service by 2009. A new 23kV feeder will be installed from this new substation to the pump station site via approximately 1.5 miles of overhead conductors. The Town of Apex is proposing to deliver electric power to the pump station from two 1500KVA 23kV/480-277VAC, wye-wye pad mounted transformers on the pump station site in accordance with the project construction drawings. These transformers will be furnished and installed by the Town of Apex. Both transformers will be supplied from the single 23kV service from the anticipated Southwest Apex Substation. The Town of Apex stated in their proposal that they will monitor the pump station load and will increase the transformer capacity as needed to ensure the pump station can operate at full capacity from a single utility transformer. The Town of Apex will own and maintain both transformers and the 23kV primary conductors and terminations. The Western Wake Partners will be responsible for the installation and maintenance of the secondary conductors and terminations.

To increase pump station reliability, the pump station design requires two redundant utility transformers. The Town of Apex has agreed to install one of the utility transformers free of charge. The installation of the second transformer will cost the Western Wake Partners a one time fee of approximately \$30,000 to purchase the transformer.

The Town of Apex's proposal stated that the contracted delivery voltage will be within $\pm 10\%$ of 480VAC. The proposal also stated that it is unlikely the voltage will vary beyond $\pm 5\%$ of 480VAC.

Metering and Billing Rates

Since the Town of Apex will meter the energy and demand usage on the secondary side of the utility transformers, the Western Wake Partners will not pay for the transformer energy losses. In addition, the metered energy and demand usages will be identical whether the power consumption is metered through two transformers or one.

The Town of Apex's proposal included three (3) billing rate alternatives;

1. Large General Service (LGS) - This service charges a single energy charge and demand charge during each billing period. The time of day at which the maximum demand occurs does not have any impact on the demand charge.
2. Large General Service Time of Use (LGS-TOU) - This service is similar to the LGS service except that there are different demand charges depending on whether the maximum billing period demand falls during "on-peak" hours or "off-peak" hours. Since the demand charges are less during "off-peak" hours, there is the potential to reduce the demand charges if the user can defer their plant operations so that their maximum power demand occurs during "off-peak" hours.
3. Large General Service Coincident Peak (LGS-CP) - For this service, the user's demand charges are measured during the 60 minute interval when the Town of Apex's demand charges are being measured by the North Carolina Municipal Power Agency (NCEMPA) during each billing period. This rate schedule can be very beneficial for users who can significantly reduce their load during the time when the Town of Apex's demand charges are being measured by NCEMPA. Standby power generators can be used during this period to eliminate the demand charges during this time; however, the Town of Apex will require the standby power generation system to be in compliance with the Public Utility Regulatory Policies Act (PURPA).

Billing Rate Analysis

The energy usage and demand rates for each billing rate alternative offered in the proposal were analyzed. Agreements for power would be structured on a recurring 4-year basis. In order to estimate projected average and peak flows at the Beaver Creek Pump Station during the first term, 2014 projected flows were used as follows to determine monthly billing: Average Daily Flow of 9.58-MGD and Peak Flow of 29.7-MGD). Based on first term flow projections, it is estimated that the average monthly energy usage and the average monthly demand will be approximately 255,000 kilowatt-

hours and 700kW respectively. The maximum utility bill for each billing period is shown in Table 1. These calculations assume the pump station maximum demand occurs during “on-peak” periods for the LGS-TOU billing rate and during the time when the Town of Apex’s demand charges are being measured by NCEMPA for the LGS-CP billing rate.

The LGS-CP billing rate is the least expensive of the three alternatives primarily due to the lower energy charge. This billing estimate for the LGS-CP rate does not include any peak shaving operations to reduce the demand charges. As stated above, the Western Wake Partners can not take advantage of using the standby power generators to reduce the demand charges by peak shaving unless the standby power generation system is PURPA compliant. In order to be PURPA compliant, the heat from standby power generators must be utilized so that the overall generator efficiency meets PURPA standards. Since there is no effective use for the heat generated by the generators at the Beaver Creek Pump Station, it is unlikely the standby power generation system at the Beaver Creek Pump Station can meet the PURPA standards. Therefore, the standby generators can not be used for peak shaving unless the Town of Apex changes their PURPA compliance requirements.

Conclusions

The LGS-CP is the recommended billing rate for this pump station. It should be noted that available billing rates should be re-analyzed based on actual utility data after the pump station is in operation.

It is also recommended that the electric utility contract with the Town of Apex include delivery voltage regulation of $\pm 5\%$ of 480VAC. Any voltage variation beyond $\pm 5\%$ of 480VAC will cause under/over voltage nuisance tripping of the pump station variable frequency drives.

The proposal submitted by the Town of Apex has demonstrated that the benefits evaluated in the initial selection have also been incorporated with the current proposal for the Beaver Creek Pump Station. To briefly recount, those benefits are as follows:

- 1) Apex will install a redundant transformer onsite.
- 2) Apex maintains the ability to respond quickly to power outages.
- 3) Apex is a wastewater system operator and understands the level of response required for emergency power outages.
- 4) Apex maintains emergency operations agreements with seventy-three other municipal electric utilities in NC to reinforce their response capability.
- 5) Apex has provided cost option plans that could reduce long term operating costs.
- 6) Apex had lower life cycle power costs than its competitor in the previous evaluation for the Western Wake Water Reclamation Facility.
- 7) Apex’s proposed future cost increases are less than its competitors.

Requested Action It is recommended that the Policy Advisory Committee select Apex as the electrical power vendor for the Beaver Creek Pump Station. It is further recommended that the PAC authorize the Lead Agency to proceed with execution of a comprehensive power services agreement with Apex for both the Western Wake Water Reclamation Facility and the Beaver Creek Pump Station.

Table 1 - Electric Billing Estimates

Large General Service (LGS)	
Facility Charge per Month	\$21.00
Energy Charge per kWh	\$0.0660
Demand per kW	\$8.55
Facility Charge	\$21.00
Energy Charge	\$16,853.76
Demand Charge	\$5,985.00
3% NC Sales Tax	\$685.79
Billing Period Total	\$23,545.55

Large General Service Time Of Use (LGS-TOU)	
Facility Charge per Month	\$31.00
Energy Charge per kWh	\$0.0614
Demand-On Peak per kW	\$10.26
Facility Charge	\$31.00
Energy Charge	\$15,679.10
Demand Charge	\$7,182.00
3% NC Sales Tax	\$686.76
Billing Period Total	\$23,578.87

Large Service General Coincident Billing (LGS-CP)	
Facility Charge per Month	\$76.00
Energy Charge per kWh	\$0.0444
Demand-On Peak per kW	\$14.00
Facility Charge	\$76.00
Energy Charge	\$11,337.98
Demand Charge	\$9,800.00
3% NC Sales Tax	\$636.42
Billing Period Total	\$21,850.40