City of Needles, California
Request for Council Action

☐ CITY COUNCIL ☒ NPUA ☐ BOARD OF PUBLIC UTILITIES
☒ Regular ☐ Special

Meeting Date: December 15, 2020

Title: Electrical Engineering Services

Background: On October 13, 2020 the Board of Public Utilities accepted a formal bid from Brooks Consulting LLC as a licensed professional engineer (PE). Brooks Consulting LLC has a three-year term with the NPUA. The following two project(s) have the highest priority to be completed;

Project 1 – 69kV System Model Project

Objective – To develop an electrical model of the Needles 69kV system, which will have all the existing known details of the lines, switching points, and substation connections to observe the existing flows, fault levels, and voltage quality. The model can also be used to examine options on how to plan future extensions and/or upgrades.

Tasks –

1. Developing a solid geographically correct layout of the 69kV system.
2. Develop a one-line diagram of the lines and its interconnections with each other and the substations. Establishing line lengths and obtaining all the electrical details including wire sizes, substation power transformer sizes and their electrical parameters.
3. Assemble all this information into an electrical system modeling package called ETAP.
4. Run the package to observe fault levels, power flow and voltages. The results of the fault levels will be needed for the Arc Flash project.

Results – The creation of a 69kV electrical system model that will be needed for current and future evaluations of operational activity and future planning of the system.

Cost estimate provided by Brooks Consulting LLC $7,000

Project 2 – Arc Flash Project

Objective – To assess the arc flash (cal/cm^2) levels on the Needles electrical system from the 69kV to the 120V/240V and define adequate PPE protection from the arc flash electrical hazard. It will follow the directions from OSHA on the expectations of such an assessment study and use the IEEE 1584-2018 calculation method for equipment and locations under 15kV, and ARCPRO for those over 15kV. It will not use the NFPA 70E directly, but may take advantage of some of its knowledge. The reason NFPA 70E is not used is because it applies to industrial sites. The study will not provide any

mitigation strategies to address any arc flash deficiency issues. Mitigation strategies are a subsequent effort that will follow this assessment study.

Tasks –

1. Obtaining all substation details, including all relay and protective equipment details.
2. Obtaining all distribution transformer sizes and the standard fusing for each size, both overhead and padmounted.
3. Obtaining complete substation details.
4. Obtaining the fault levels around the system at both the 69kV and 12kV levels and requires the results of Project 1 above.
5. Develop the arc flash TCC curves, which includes the relay and fuse protection curves.
6. This model can be used to estimate arc flash levels.
7. Write a report summarizing the arc flash results on the 69kV, 12kV, distribution transformers, and the services for 277V/480V and 120V/240V.

Cost estimate provided by Brooks Consulting LLC $17,000

The Board of Public Utilities approved the recommended action on December 1, 2020.

Fiscal Impact: To be funded by the Electric departments FY21 budget with Engineering Services

Recommended Action: Authorize Brooks Consulting to complete a 69kV model not to exceed $7,000 and an Arc Flash study not to exceed $17,000

Submitted By: Rainie Torrance, Assistant Utility Manager

City Management Review: _____ **Date:** _____

Approved:☐	Not Approved:☐	Tabled:☐	Other:☐
			Agenda Item: _____