CITY OF RIVIERA BEACH – MEMORANDUM

TO: UTILITY SPECIAL DISTRICT BOARD OF DIRECTORS

THROUGH: JONATHAN EVANS, CITY MANAGER, MPA, MBA, ICMA-CM

FROM: ARKIE CARABALLO, WATER PLANT SUPERINTENDANT

SUBJECT: SCADA SYSTEM UPGRADE

DATE: DECEMBER 18, 2019

CC: GENERAL PUBLIC

Background:

The City utilizes a Supervisory Control And Data Acquisition (SCADA) system to monitor the water plant chemical dosing and plant operations. The existing system was implemented and upgraded from 1987 through 1993. U.S. Homeland Security has mandated that the SCADA system be upgraded to meet current security requirements. This involves adding a Firewall for data security that is sole sourced, the Data Flow Telemetry System (DFS) (last upgraded in 1999) and IFIX (last updated in 2002). These upgrades are required to meet current Homeland Security mandates and to avoid fines for non-compliance.

The SCADA system used by the City of Rivera Beach was designed around the architecture of Windows NT 4.0; Windows 2000 Professional; Windows XP Professional and Windows 2003 server operating system.

Two Major components plus a physical layer comprise the system. The first part is software, iFIX, which is currently running 3.5. Most plants in the United States operate version 6.0 which meets all security standards for Homeland Security. The City is running at the Windows XP version which is no longer supported. The City's vendor has advised the City that it must upgrade to avoid penalties and meet continued board standards for water system safety.

The Second Part is a program called Data Flow Systems (DFS), which runs on UNIX environment running Java 1.3, which was end of life in May of 2000. Both components run a high risk of being compromised by outside sources. The system now requires a Firewall to prevent breaches.

Below a brief synopsis of the SCADA system.

Supervisory control and data acquisition (SCADA) is a system of software and hardware elements that allows industrial organizations to:

- Control industrial processes locally or at remote locations
- Monitor, gather, and process real-time data
- Directly interact with devices such as sensors, valves, pumps, motors, and more through human-machine interface (HMI) software
- Record events into a log file
- SCADA systems are crucial for industrial organizations since they help to maintain efficiency, process data for smarter decisions, and communicate system issues to help mitigate downtime.

The basic SCADA architecture begins with programmable logic controllers (PLCs) or remote terminal units (RTUs). PLCs and RTUs are microcomputers that communicate with an array of objects such as factory machines, HMIs, sensors, and end devices, and then route the information from those objects to computers with SCADA software. The SCADA software processes distributes, and displays the data, helping operators and other employees analyze the data and make important decisions.

For example, the SCADA system quickly notifies an operator that a batch of products is showing a high incidence of errors. The operator pauses the operation and views the SCADA system data via an HMI to determine the cause of the issue. The operator reviews the data and discovers that Machine 25 was malfunctioning. The SCADA system's ability to notify the operator of an issue helps him to resolve it and prevent further loss of product.

Citywide Goal:

It is the goal of the City to upgrade the SCADA system to monitor the City's water system utilizing current technology and meeting Homeland Security requirements.

Budget/Fiscal Impact:

The budget/fiscal impact for this computer protection product is $125,524 for the firewall from Check Point (sole source), $23,404.06 for Dell computers, and $7,814.00 for DFS and implementation.

Recommendation(s):

Staff recommends that the Board approves this system upgrade through Resolution Number 45-19UD.