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Meeting Date: September 26, 2019
File No.:



To: Chair and Members
Lambton Area Water Supply System Joint Board of Management

From: Clinton Harper
General Manager

Subject: Radio / PLC Upgrade Project Update

Recommendation

It is recommended that the Board Approve the SD-WAN communication solution as outlined in Experteer's "Network Upgrade Solution Final Proposal for LAWSS" dated September 12, 2019.

Background:

In November 2015, LAWSS hired Megacomm to complete a "Radio Communication Feasibility Study" to review the existing system and provide a radio system upgrade recommendation based on current technologies.

Based on the 2015 study, a project for a new 400MHz SCADA Wireless IP Radio Network was developed. The new project listed all equipment needed and outlined a scope of work. In August 2016, the project was split into material and engineering components. In November and December of 2016, all Radio and PLC equipment were purchased by LAWSS.

In May 2017, WSP was awarded the engineering portion of the work, which included design, and tender preparation. At that time WSP was provided a set of PLCs to develop the program code. In September 2018, the construction portion of the project was award to Experteers.

On Wednesday, November 14th 2018, LAWSS and OCWA staff attended a factory acceptance test (FAT) for the project at WSP headquarters in Toronto. The test was intended to demonstrate, or prove, the PLC coding of the project had been successfully completed. Once accepted, the next step would have been to hand over all of LAWSS radio/PLC equipment to Experteers so they could be built into new panels, etc.

During the FAT, WSP was able to successfully demonstrate that the PLC coding of the project was complete. However, the FAT identified an unexpected issue with the radio equipment. According to the radio specialist, equipment that has been identified in 2016

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had not been performing as per manufacturer specifications and could not be used to complete the project.

In January 2019 the Board agreed to a modified plan proposed by Megacomm that increase the project cost by \$159,800 and involved the purchase of 5 new radios that would allow us to salvage a majority of the pre-purchased equipment. The final system was still planned to be a licences radio communication network. Experteers was permitted to proceed with the installation of antenna and ELPS tower foundation while preparation was made to complete a FAT on the modified system.

By May 2019 Megacomm had still been unsuccessful in their efforts to configure the radio communication system design. Due to this, Megacomm was removed from the project. Experteers, the company LAWSS has hired to complete the construction of the system, was asked to develop a solution that utilizes as much of the existing system as possible.

Comments:

The recommended solution proposed by Experteers involves the construction of a Software Defined Wide Area Network (SD WAN). The SD-WAN network is a cloud-based network that offers substantial advantages over a conventional radio system. Key advantages over conventional radio system are:

- Long-term solution network for years to come of multiple levels of services.
- Integrated intruder detection and protection. Greatly improved security
- Data collection, reporting, and handling is vastly superior.
- Interference, weather, and other circumstances will not affect links.

The primary disadvantage of cloud-based versus a conventional radio network is in the annual licensing fees which are outlined below. Another disadvantage of the cloud-based solution, that is arguably a non-issue, is the systems dependence on North America's existing communication network. Redundant service providers are built into the fees outlined and provide for the necessary system redundancy.

The construction of the cloud-based system is the best option available for communication LAWSS going forward. The solution will utilize as much as the current project as possible.

Consultation:

This report was prepared in consolation with OCWA Operational Staff and Experteers.

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Financial Implications:

The construction of as SD-WAN for communication at LAWSS is expected to put the project approx. \$101,330 below the approved budget.

Total Project Budget:		\$512,000
Actual Spent (as of September 2019)	-	\$347,474
Additional Engineering for SD-WAN	-	\$10,500
Additional Construction for SD-WAN	-	\$52,696
Saving from Pre-approved Budget	=	\$101,330

Due to the managed nature of the communication network under SD-WAN configuration licensing costs will be increased. A summary of the increase is provided below:

	Existing Radio System	SD-WAN
Licencing:	\$544	\$4,555
Service Provider:	+0	+\$480
Total Annual Fees:	\$544	\$5,035

This report was prepared by Clinton Harper, LAWSS General Manager

Attachment(s): none.