BUSINESS CASE ANALYSIS

Project: Purchasing a PRAMP Owned Data Acquisition System

1. EXECUTIVE SUMMARY

This document prepares the preliminary business case for the option of purchasing a PRAMP owned data acquisition system. This business case includes background information, a brief description of the data acquisition system, purpose, costs, benefits, and potential challenges.

PRAMP staff reviewed the current data management system after a missed canister event occurred on July 21. It was noted that due to a lack of control on the data system, PRAMP is limited in how it can provide proactive actions to prevent the issue from re-occurring, nor can PRAMP provide prompt support on the field service Maxxam provides. In this business case, a recommendation of purchasing an Envista ARM data acquisition system is assessed with the intention to improve the reliability of the PRAMP canister program.

2. THE PROJECT

a. Background Information

A Non-Methane Hydrocarbon canister was triggered on July 21 at the PRAMP Reno Station and the canister was filled. This event was not captured by Maxxam staff during the manual daily data review. In addition, both the automatic alarm notification functions setup on the Maxxam server and SiteAnalyst failed to generate the notification for this event. The triggered canister was discovered during a Maxxam site visit on August 9. Maxxam PM contacted PRAMP Technical Program Manager (TPM) and reported this incident on August 11. PRAMP TPM requested to send the canister to the sub-contract lab for analysis on August ??. The hold time for the canister was past as a result of delayed shipping (canister was shipped to the sub-contract lab on August 15).

The PRAMP TPM relies on Maxxam to provide station status through daily emails. As the current data acquisition system (DAS) belongs to Maxxam, PRAMP TPM does not have access to view data or operate the system. PRAMP TPM can only rely on Maxxam to be aware of immediate problems. If errors happen, PRMAP has no control of it and may be 'in the know' too late. Having access to the DAS would allow PRAMP TPM to gain the control of the data and data system, and over the real-time monitoring of events and possible exceedances.

b. Data Acquisition System (DAS)

Data Acquisition *is the process of sampling signals that measure real world physical conditions and converting the resulting samples into digital numeric values that can be manipulated by a computer.** After a pollutant is measured by an analyzer, it is converted to an electrical signal. The signal is transformed into a unified form which can be sampled by a DAS. Currently, Maxxam uses Envista ARM DAS to poll data, perform data review, generate reports, perform QA/QC procedures, submit real-time data to PRAMP website, upload data to Alberta's Ambient Air Quality Data Warehouse and so on.

* Source: https://en.wikipedia.org/wiki/Data_acquisition

Envista ARM is a US company, but their system has been widely adapted in Canada, such as by Fort Air Partnership, EC NAPS in Ottawa, EC Regional Meteorological offices and Montreal and Vancouver networks.

Below are the keys functions Envista ARM provides:

- to offer a variety of dynamic displays to support easy observation of system status and monitored values from the air quality monitoring stations;
- to perform data analysis and reporting;
- to collect data from air monitoring stations at scheduled times or upon request;
- to send alerts to allow for the selective transmission of alerts to users by email, SMS or even voice calls;
- FTP Import Export that provides mechanisms of transferring data to the PRAMP websites as well as to AEP;
- the ability to generate xml data file for data submission to Alberta's Air Quality Data Warehouse.

c. Purpose

The purpose of this Business Case is to seek PRAMP Committee's support for purchasing the Envista ARM data acquisition system that would allow PRAMP to gain the control of the data, the data system and over the real-time monitoring of events and possible exceedances.

d. Benefits

- <u>To gain control of the data, the data system and over the real-time monitoring of events and possible exceedances.</u>

If the system were purchased, all the AQM data would be polled back from each PRAMP AQM station and stored in the PRAMP server through DAS. When receiving concerns or complaints from industries or residents, PRAMP would have direct access to the data system to view the data and perform data analysis. Different dynamic display settings could be setup to closely monitor real-time data during plant upsets,as well as known local events and influencers which may have an effect on monitoring results.

- <u>To claim data ownership</u>

According to the AMD, PRAMP airshed is required to kept the raw data and final data for 3 years and 10 years, respectively. As all the data would be kept in the PRAMP server, data will be kept as long as PRAMP desires. Maxxma will remotely log in to the server to perform QA/QC on data. The records of all the data verification and validation activities would be recorded and kept in the PRAMP server for future use, and data in the system would remain up-to-date all the time. Whenever PRAMP requires to view the data and is asked for data/report for audit purpose, data would be available in the system.

- <u>To customize alert functions to meet different needs</u>

There are various alert functions that can be added to closely monitor changes inside the AQM stations and ambient air around the AQM stations, such as hourly concentrations recorded above a certain level or above the AAAQOs, shelter temperatures recorded above or below certain degrees, wind data recorded no change for more than so many hours, etc. Alert notifications could be generated as soon as hourly data is retrieved from the AQM stations and can be received by e-mail, SMS or voice calls.

- To be able to analysis data in more detail using comparison functions with multiple stations and parameters

Envista ARM has various built-in report functions that give the ability to generate station data reports in standard tabular or graphical reports with multiple stations and parameters. For example, the Group report function can be used which reflects a user defined group of monitors related to one or more station. The histogram function can be used to show the frequency of occurrence of various ranges of a monitor's value. The traditional procedure of performing data analysis is to download the data from a DAS and put into the system, like Microsoft Excel. Then, work would be done on the data format so it can be used to generate charts/tables. These built-in functions from Envista ARM would help to analyze data in more detail, more quickly and more accurately.

e. Potential Challenges

- System would need to be maintained by PRAMP personnel, not Maxxam. Thus, PRAMP will need to assign or contract with personnel who are trained to manage the DAS.
- Strong communication would need to be in place between PRAMP PM and Maxxam. Maxxam will need to inform PRAMP personnel of any changes they are planning to make directly on the datalogger or instrument prior to a change so the configurations on the server matches the settings in the field's logger.
- Extra time might be needed when performing data verification and validation. Maxxam will need to remotely log in to the PRMAP server when performing QA/QC on data. The system might respond slower than normal when working remotely.

3. ESTIMATED COSTS FOR ENVISTA ARM LICENSE

Desciption	**Cost - US$**	**Cost - CDN$**
YEAR 1		
Licence for Envista ARM for 4 stations with support for 2 users	$10,900	$14,279
Initial installation and maintenance (18 months)	$1,965	$2,574
Shippng	$100	$131
Computer hardware and software		$3,000
TOTAL ESTIMATE FOR YEAR 1		**$19,984**
YEAR 2		
Annual maintenance (pay for 6 months)	$2,100	$2,751
TOTAL ESTIMATE FOR YEAR 2		
YEAR 3		

Annual maintenance	$4,200	$5,502
Possible future costs:		
Licence expanded for additional user	$1,600	$2,096
Licence expanded to support 5 stations	$1,800	$2,358

4. LEARNING FROM LAKELAND INDUSTRY AND COMMUNITY ASSOCIATION (LICA)

LICA purchased an Envista ARM system in 2014 and has found that response time to contraventions has been greatly reduced (LICA is immediately aware of network issues). LICA is in direct control of its data management system and therefore LICA is able to develop and implement procedures related to the data it owns. All raw and corrected data are stored on a LICA-owned pollable database on LICA-owned hardware; special requests for data aggregation by stakeholders are more easily and quickly accommodated. LICA is in a better position to change network operators (if needed) without loss of data and minimal downtime related to the handover of network operations; the data acquisition and control system is tied to the network, not the contractor operating it.