

# Using LIMS to improve water quality control in Argentina



Agua y Saneamientos Argentinos (AySA) is a water and wastewater company established by the National Government of Argentina to provide essential services and improve drinking water and sewage in the city of Buenos Aires and its suburban areas. AySA provides clean water for around 10 million people across a 1,700 square kilometer service area, consisting of 17,225 km of drinking water pipeline and 9,938 km of wastewater pipeline. This makes AySA one of the largest suppliers of drinking water and sewage sanitation in the world. The company has a number of water treatment laboratories, as well as a central plant that is in operation 24 hours a day, monitoring the physical, chemical and biological properties of the water and ensuring water quality from the time it enters the plant until it reaches Buenos Aires households for consumption.

AySA adopted a laboratory information management system (LIMS) to improve quality control processes in its Central and Plants laboratories and accommodate an increasing number of samples requiring accurate sample management. The company selected Thermo Scientific™ SampleManager™ LIMS software to improve laboratory efficiencies, productivity and sample integrity.



The company has been using SampleManager LIMS software for 10 years to manage quality control data; maintaining a complete record of sample data and history to ensure the safety of drinking water and facilitating compliance with industry regulations.



### Company background

AySA carries out more than 500,000 laboratory tests each year, analyzing in excess of 240,000 samples to ensure the quality of its drinking water and environmental compliance of treated wastewater. The company, together with the National Government of Argentina, is engaged in the task of updating and improving the treatment and distribution systems for both potable water and sanitation—basic pillars for the development and welfare of the community. AySA currently supplies 8,136,416 inhabitants of the city of Buenos Aires and its suburban areas with clean drinking water.

In order to perform this task, AySA has three water treatment plants for drinking water, General San Martín in Palermo, Buenos Aires, General Belgrano in the district of Quilmes, Buenos Aires Province and Dique Luján in Tigre, Buenos Aires Province. The company also has four wastewater treatment plants in the Province of Buenos Aires, including Southwest in La Matanza, North, the party of San Fernando, The Jagüel, the party of Esteban Echeverría and District One in the district of Ezeiza. In addition, water quality is continuously controlled through AySA's Command Center and Remote Service and Central Laboratory plant, which is equipped with the latest technology and is in 24-hour operation.

AySA supplies drinking water from surface water that comes from the Rio de la Plata, as well as water which comes from groundwater drilling through deep wells from the Puelche aquifer. The latter makes up 4.5% of the total water produced by the company, with surface water production at 4,442,065 m<sup>3</sup>/day and groundwater production at 231,416 m<sup>3</sup>/day. The production of surface

water comes from two large treatment plants: the General Belgrano and the General San Martín. The latter is one of the largest treatment plants in the world, covering 28.5 surface acres and with a production capacity of almost three million cubic meters per day.

AySA is using SampleManager LIMS software to help manage the quality control processes and data generated by the company's central laboratory and its six operating plants, ensuring potable water quality and sanitation system safety.

### LIMS and the water industry

Companies involved in water and wastewater processing have identified a need for a solution to automate current manual/paper processes. LIMS works by scheduling and holding sampling plans, which are then used to generate a collection run for each sampler. The collection run defines where samples must be taken from, what sample bottles must be collected and what onsite tests have to be performed. Samples are then analyzed in the laboratory and water quality data, as well as details of what has been carried out in the field, is entered into LIMS. This is important as water companies must collect and analyze their water samples in a closely regulated environment, maintaining complete quality control records in case of inspection or audits.

In Argentina, water processing companies must comply with regulations set out by The Ministry of Public Works, which includes recommended water quality levels. The National Agency for Water and Sanitation Works (ENOHSA), which is a decentralized agency under the

Ministry of Public Works, then provides financing and technical assistance to water processing service providers. The aim of ENOHTSA is to organize, manage and implement infrastructure programs in compliance with national policies on water and sanitation. For example, the Programme of Water and Sanitation for Communities of less than 50,000 inhabitants (PROAS)—Bank Credit 1895/OC-AR, diagnoses the demand for potable water and sewage in each province of Buenos Aires, influencing the way in which AySA must operate.

### **Business challenge**

Before implementing SampleManager LIMS software, AySA was experiencing an increase in the number of samples from diverse sources that needed to be processed in its laboratories. As the company did not have a LIMS in place, it decided to automate its processes with a LIMS capable of managing this diversity and sample increase with the necessary flexibility.

A further driving factor when selecting SampleManager LIMS software was that AySA required a single database to improve the process of managing quality control data and standardize across its many laboratories. The company also wanted a system that would eliminate errors that occur through the manual transcription of data. In addition, the LIMS system would allow AySA to produce accurate and detailed reports to meet the requirements of regulatory authorities. In today's regulatory environment, AySA is required to submit quality reports, including distribution and production plans and details of any abnormal results.

### **Vendor selection**

The company selected SampleManager LIMS software due to Thermo Fisher Scientific's reputation as a leading provider of LIMS solutions to the water industry. For more than 20 years, Thermo Fisher has effectively controlled the processes of large water companies worldwide with rigorous testing and real-time monitoring.

Alberto Chiari, technical and geographical systems manager at AySA, explains, "We selected SampleManager LIMS software because Thermo Fisher Scientific is a market leader in the field of LIMS, with systems already installed into a number of large water enterprises. We had confidence in the company's ability to improve our quality control processes, ensuring the efficient production of safe drinking water and environmentally compliant wastewater in our local and regional laboratories."

Alberto Chiari continues, "We also required a system that would integrate and connect easily with other applications and instruments in and out of our laboratory, providing one standard user-interface and helping enforce process standardization across multiple laboratories. This is particularly important as we have a number of laboratories that must be able to work together to ensure water safety, including those that focus on the production of drinking water, laboratories for the treatment of wastewater and our central laboratory, which controls the quality of the water we distribute to the Buenos Aires population."



### **Implementation**

Following the initial implementation, AySA continually upgrades their system according to the needs of the organization. Alberto Chiari comments, "As long standing customers of Thermo Fisher, having experienced the benefits of the company's LIMS system for almost 10 years, we were extremely happy to upgrade to a new version of SampleManager LIMS software."

The LIMS is scalable for a large user base and currently has 110 users at AySA. Alberto explains that the LIMS offered the flexibility needed to handle the growing quantity and diversity of samples that AySA is required to process in its laboratories. SampleManager LIMS software is flexible and configurable to accommodate various workflows, lab types and user communities across the enterprise.





At AySA, the LIMS is connected to a geographic information system (GIS), which gives an accurate location fix for each sample as it is collected. GIS ensures that water samples are collected in the correct supply zone as each address is checked against an on-board database. The system also allows AySA's sample manager to move workloads between sample collectors as required and also to add extra ad hoc samples. The ability to connect LIMS to GIS in order to record sample history and location enables AySA to be accountable to regulatory authorities.

The LIMS system is also being used in connection with AySA's enterprise business intelligence (SAP BusinessObjects). For AySA, a coherent strategy that integrates data between the LIMS, Business Intelligence (BI) and GIS systems across the enterprise was extremely important. As LIMS can be easily integrated with BI and GIS, this was a key factor influencing the company's upgrade decision.

### **Benefits**

Since deployment of SampleManager LIMS software, the system has helped AySA to improve its processes and methodologies for providing clean water and sanitation to the population of greater Buenos Aires. SampleManager LIMS software has automated and accelerated processes within the company's laboratories from sample collection to results and report generation, saving time and reducing costs through improved production efficiencies. Furthermore, secure access to the LIMS data is available for laboratory staff and remote users enabling all system users to view the same information and ensuring consistency and clarity across a number of laboratories.

Alberto Chiari explains, "SampleManager LIMS software has been able to deliver real-time feedback on sample deviations to increase efficiencies and has enabled faster decision-making, integrated systems and standardized processes across our multiple laboratories."

SampleManager LIMS software has also been instrumental in assembling the critical data generated in AySA's laboratories into a variety of report formats, ensuring water supplied to its customers complies with strict government regulations and reporting requirements for the water industry. Furthermore, the use of GIS in connection with the LIMS enables samplers to report on the acceptability of sampling points and the safety of sampling sites. This can go through to the management report for remedial action. GIS identifies the exact location and site of samples being scanned and provides proof that samplers are using the right sampling point.

The LIMS has also increased data accuracy by reducing paper and manual work, eliminating transcription errors. The addition of SampleManager LIMS software to AySA's laboratories has not only ensured timely delivery of quality results, but has also improved the internal operational efficiency of the company. Alberto Chiari comments, "Since introducing the system into our laboratories, SampleManager LIMS software has improved productivity and increased accuracy, enhancing efficiency and the quality of service provided by AySA. The LIMS is a critical tool in our laboratory infrastructure that enables us to efficiently manage a wide variety of results and provides for the consistent and reliable delivery of data that is required to ensure the quality of drinking water."

## Future

Currently in the area that is serviced by AySA, 8,136,435 inhabitants are supplied with drinking water while 5,682,174 people benefit from the company's wastewater treatment service. In the coming years, one of the most important tasks for AySA, together with the Argentinean authorities, is to expand this service to incorporate those people who do not yet receive these essential services.

Eventually, AySA hopes to achieve a fully integrated solution, with all instruments connected. Alberto Chiari comments, "We plan to ensure the smooth flow of information between our different company areas and laboratories, connecting instruments and quality control processes with the use of LIMS and SAP BusinessObjects. An integrated workflow will become even more important as we plan to extend the number of laboratories using a LIMS within AySA. The fact that LIMS creates a single database and user-interface for the management of samples across multiple laboratories shows that we have already taken a significant step towards achieving this goal of a connected solution. It is a great advantage that SampleManager LIMS software is able to connect with other software solutions and equipment and enterprise systems."

SampleManager LIMS software enables customers to extend the business of the laboratory throughout the enterprise, providing both the integration of instruments and systems and the interoperability necessary to transform data into relevant business drivers.

## Conclusion

With an increasing number of samples to analyze and subsequent need to improve quality control processes, AySA has equipped its laboratories with the technology and infrastructure needed to ensure the quality of its drinking water, as well as compliant wastewater treatment. SampleManager LIMS software has enabled the company to supply the population of Buenos Aires and the surrounding suburban areas with safe drinking water and sanitation services.

SampleManager LIMS software has been used at AySA for over 15 years. The LIMS has simplified compliance with industry regulations by providing easy access to sample history, results and GIS information.

Alberto Chiari concludes, "SampleManager LIMS software, which can be integrated with SAP BusinessObjects, has made our goal of a connected workflow across multiple laboratories possible. The LIMS has also improved data accuracy and sample integrity at AySA by providing all system users with easy access to quality data and eliminating the need for manual data transcription. Using SampleManager LIMS software, we have significantly improved our quality control processes, enabling us to provide the population of Buenos Aires and its suburban areas with high quality potable water and sewage sanitation."