



Long Beach Water and Its Journey to a New LIMS

Result is a dramatic increase in lab productivity and data quality while eliminating manual tasks and operating costs.

Company Profile

The Long Beach Water Department (LBWD), formed in 1911, maintains a state of the art water quality laboratory and performs over 60,000 tests annually, testing for over 100 drinking water contaminants. Scheduled testing to monitor the drinking water quality is conducted at the 10,000 sq. ft. Water Quality Laboratory located in LBWD's Groundwater Treatment Plant and additional testing is conducted at designated field testing stations throughout the city. The laboratory has a staff of 8 full-time employees and the laboratory is organized into sections; Sample Management, Organics, General Physical Chemistry, Microbiology, and Metals & Minerals.

Their Challenge

In 2014, LBWD went through an RFP process to replace their existing Labworks® Laboratory Information Management System (LIMS). They had developed a list of requirements that their existing LIMS could not meet as their business rules are dynamic and the organization has evolved. This included the ability to import and export testing data to and from contract laboratories and have a proven method for validating the accuracy of the data. The laboratory wanted to use barcode and scanning technology not only for sample management but to further automate lab operations and increase efficiency. In addition to barcoding, the ability to integrate with existing instruments was extremely important. The team realized that this was a significant area in which automation could reduce costs, eliminate transcription errors, and accelerate turnaround time.

The team required the ability to have field technicians conduct testing at sample testing locations, input test data into a mobile device like a smartphone or tablet, and transmit the data in real-time back to the laboratory. Having this capability is very important as the field technicians cover a significant number of sampling locations on a daily basis and were using mostly manual methods for managing the sample data. The manual methods included filling data on paper clipboards while in the field and then re-entering data into the LIMS upon returning to the laboratory. This delayed analysts from getting the samples and led to transcription errors and wasted time. A focus of the LIMS replacement project was to eliminate numerous data re-entry events. In addition to the aforementioned field sampling paper forms, it also included re-entering data from their numerous instruments into the LIMS for reporting. A major focus of the new LIMS would be integration with the following instruments so that the data could automatically be imported, thus eliminating transcription errors.



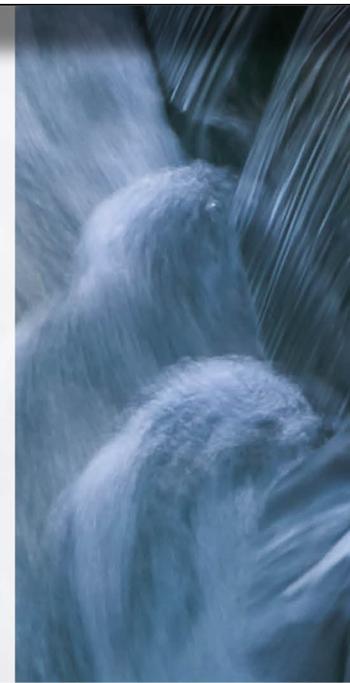
Long Beach Water
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Long Beach Water Department
Long Beach, California
www.lbwater.org

The Long Beach Water Department (LBWD), provides potable water, recycled water and sewer collections services to a population of close to 500,000 within a 52 square mile area in the City of Long Beach. The Department's primary responsibilities are to provide its citizens with safe and affordable drinking water while managing resources and facilities to ensure reliable water quality. The Groundwater Treatment Plant, one of the largest in the nation, can produce 62 MG of water on a daily basis for the City of Long Beach.

“*TITAN® LIMS has provided Long Beach Water Quality Laboratory with the ability to increase productivity while maintaining high quality data.*”

- Cynthia Andrews-Tate, Water Quality Manager, LBWD Water Quality Laboratory



Instruments interfaced with the LIMS

Varian 4000 GC/MS	Dionex ICS 3000
Varian 2000 GC/MS	Agilent ICP-MS 7500
Varian 450 GC/ECD Galaxy	QuickChem 8500 series 2
OI Analytical Aurora TOC	HACH DR 6000
PE AA3300	Mettler Toledo T50 Alkalinity
Dionex ICS 2000	

Along with the instrument integration, the laboratory also required a method to automatically import work that was subcontracted, such that the data from these vendors could automatically be imported into TITAN® so that there would be no need to re-enter any data. For any laboratory, the final product is data in the form of reports. A critical aspect of the new LIMS was the ability to generate all of the reports that were needed to meet state and federal reporting requirements, along with electronic data deliverables (EDD). The team had over two dozen required reports; these included management reports, internal routine monitoring reports (reservoirs, wells, lakes, distribution, wastewater), regulatory reports, THM, HAA, VOC, Lead and Copper, and Metals. In addition, they were also able to leverage 50+ canned reports in the LIMS designed to help manage daily laboratory operations; these reports included backlog, production, turnaround time, worklist, and QA.

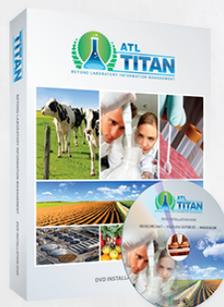
“
The lab has finally moved into the 21st century using cutting-edge technology.”

• E.M., LIMS Administrator

LBWD required a new LIMS that would be easier to learn and deploy. This was especially important in onboarding new lab staff. Being able to quickly find data with a query tool and having easy access to SOPs and other lab documentation were additional capabilities lacking in the existing LIMS. The laboratory also knew that having a broad range of technical training options would ensure that they would be able to get the most value from the new LIMS. They also required that the twelve years of data from their old system be migrated to the new LIMS so that they would not lose any valuable data when looking at historical trends.

Our Solution

Long Beach Water Department completed their competitive RFP process and chose ATL TITAN LIMS based on several factors in addition to its ability to meet the functional requirements of the RFP including modern program tools and ATL's 20+ years of expertise in the water/wastewater industry. LBWD was impressed with TITAN's rich feature set that had strengths in all stages of their testing process beginning with a modern, intuitive interface and user-friendly query tool that users find easier to use than the previous LIMS. A powerful sample scheduler was also essential, as the majority of the work is pre-scheduled. TITAN is designed to be highly configurable and allow users to define and manage workflows and create user-definable graphical dashboards.



TITAN allows for the transfer of testing data between the LBWD and contract laboratories - this has

proven very beneficial in terms of improving data quality and reducing turnaround time. TITAN has also made it easy for the laboratory staff to access essential documentation like SOPs, instrument calibration, and employee training records. TITAN provides LBWD the ability to create a wide variety of management reports as well as EDD files that can be automatically uploaded to the state of California for submitting water quality data to the state's water quality monitoring (WQM) database.

Instrument Integration

ATL engineers created a requirements document for each instrument that was shared with the team to review and approve, prior to beginning development. Some instruments support the ability to receive a worklist from the LIMS, then run the samples and insert the results before the worklist is sent back to the LIMS. This process significantly reduces human interaction and enhances data quality as there is no need for cutting and pasting to Excel or re-entering data. Some instruments do not support the ability to import worklists.



Instrument integration accelerates data management with TITAN LIMS

For those instruments, ATL engineers created tools to import that data that is exported from the LIMS, including the date and time stamps of the import and the instrument information that created the file. In addition, ATL provided an auditor-friendly requirements document so anyone can see what data is generated and where it is being placed in the LIMS, along with any additional information such as dilutions, calculations, etc. The instrument data can be imported on-demand or it can be scheduled to be imported on a timed basis.

Field Data Collection

One area of significant cost savings and impact which TITAN has made to the organization relates to their field sample testing process. Prior to implementing TITAN, the field technicians at LBWD would visit 56 field testing sites every week, not including the 33 reservoir tanks and 28 source water wells sampled on a monthly basis.



At each site, the technicians would enter field data on a paper worksheet, return to the lab and manually transfer the field data to a Chain of Custody (COC) form. Then the data would be entered manually into the LIMS. The COC and samples would then be transferred to a lab analyst in Microbiology, who would then re-enter field data into a worksheet in the LIMS. This step would be especially time consuming since they would need to input additional details like chlorine residual and pH measurements. In addition to being a very costly and time-consuming process, there were numerous opportunities for data transcription errors that would result in data quality issues.

Once TITAN was implemented, things improved dramatically. TITAN iMobile is a mobile solution,

“
I love iMobile. It was taking me a long time to enter data before but I have so much more time now!
”

• J.T., Water Sampler

integrated with TITAN, which allowed the field technicians to enter field data into a tablet at a field testing site. Since the tablet is connected to the Internet via cellular connection, iMobile is able to sync to TITAN at the lab and upload the field data into the LIMS. iMobile is also able to generate an electronic Chain of Custody and both the COC and the field data can be transferred to the analysts in the lab before the samples are even physically logged in. The benefits that TITAN and iMobile have brought to LBWD are compelling. This solution has eliminated manual entry and re-entry of data and reams of paper. The time saved by eliminating these manual activities was enormous. LBWD estimated that implementing TITAN with iMobile is saving 60 minutes a day per technician. The savings basically paid for the hardware (tablets for the field staff) and iMobile software in less than 12 months. Turnaround time on sample testing has been greatly reduced as has the number of transcription errors.

Executive Summary



Although there was a significant amount of effort that went into the LIMS project, from the selection of the new LIMS through deploying many new enhancements and customizations (reports and EDDs), it was a sound investment. The TITAN system has dramatically increased the laboratory's ability to meet the demands for the rapid delivery of high quality data while reducing waste and maximizing the efficiency of the laboratory team. By eliminating a significant amount of paper, along with many manual and mundane tasks, the laboratory team can focus on the chemistry and microbiology analysis. The new LIMS, along with instrument integration, iMobile for field data collection, and

electronic reports has not only saved time and money, but increased the confidence in generating high quality data in the state of the art Long Beach laboratory.



Groundwater Treatment Plant and Laboratory

Accelerated Technology Laboratories (ATL), headquartered in West End, NC, provides laboratory automation solutions to a variety of industries from analytical, environmental, food & beverage, water and wastewater, chemical, government, public health, clinical testing and manufacturing. ATL's LIMS products are installed in over 575 laboratories around the world, and supported by a steadfast commitment to excellence in product quality, support, and training. ATL is one of the few LIMS providers that is ISO 9001:2015 certified. For additional information, visit: www.atlab.com.