

# USING HACH WIMS™ HELPS COLORADO WWTP REDUCE ANNUAL OPERATING EXPENSES BY ALMOST \$300,000

The Littleton/Englewood Wastewater Treatment Plant (LEWWTP) is the third largest Publically Owned Treatment Works (POTW) in the state of Colorado. LEWWTP is rated at nearly 50 million gallons per day (MGD) and currently runs around 22 MGD.

## Situation



The large plant, located along the South Platte River near Denver, is required to exceed secondary treatment requirements by removing ammonia and nitrate from water. In 2003, Littleton/Englewood was managing all of its plant data with a manual process. Technicians at five different locations would fill data into paper reports which were compiled into a larger reporting spreadsheet. Those larger sheets were then compiled by analysts and entered into a database through custom-developed Excel sheets. The process resulted in inconsistent and inaccurate data that

couldn't be graphed for analysis over time. Automated data collection was limited to lab-generated data and did not include operations or field data such as flow indications or pump status.

Collecting data manually was a critical time drain and it didn't yield any useful data. The data was only used to generate regulatory reports, and little time was given to interrogating the data for excursions.

As a result, during the nineties, LEWWTP averaged two permit violations per year. The manual system didn't help troubleshoot the causes of the violations or provide information to help prevent them. Greg Farmer, process control administrator for LEWWTP admitted, "If we could make permit we were happy...it didn't matter what it cost."

## Solution

A collaborative team consisting of the database analyst, process specialist, IT Department, technology consultant, and SCADA, LIMS and business service administrators selected Hach WIMS to manage the data flow. Information is transferred from the SCADA system, portable solutions in the field, and LIMS, and is stored in a central database designed specifically for water and wastewater facilities. The simple-to-use dashboard allows a single user to quickly access information whenever it is needed. With WIMS,

data is automatically transferred from existing systems or it is entered manually just one time. The utility was able to change the way it operated because WIMS gave it easy access to accurate data.

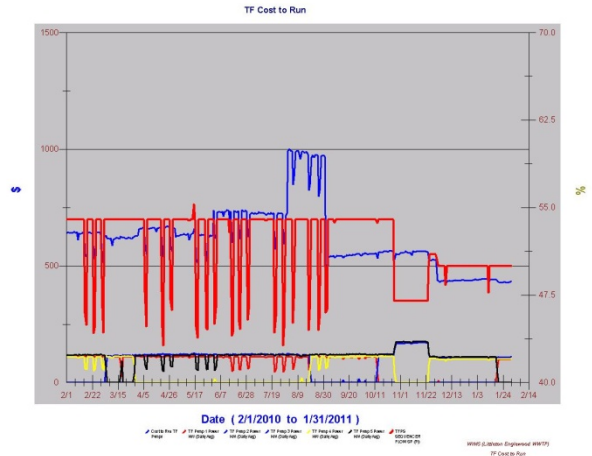
LEWWTP purchased WIMS because it provides a single location for all their data and consistency across the operation. Fast, automated data capture eliminated data inaccuracies and alleviated the critical time drain of the manual process. Hach's WIMS system was a cost effective solution that helped save both time and money.

## Results

### INFORMATION ACCURACY AND ACCESSIBILITY

Using WIMS, Littleton/Englewood can quickly check the accuracy of their data by pulling up correlation information to compare data relationships. This allows the user to determine the impact of one process over another. For example, examining the effect of energy usage on pump usage. The incoming data check can also help recognize data points that are outside of the specified limits, identifying a potential issue.

During a plant expansion project it was discovered that erroneous flow data was inflating the flow rate. Hach WIMS data helped identify the problem and save significantly on construction cost. The most difficult part of the process was simply identifying which variables to compare in order to clarify. The entire process took only 30 minutes compared to two to three days using the old process.

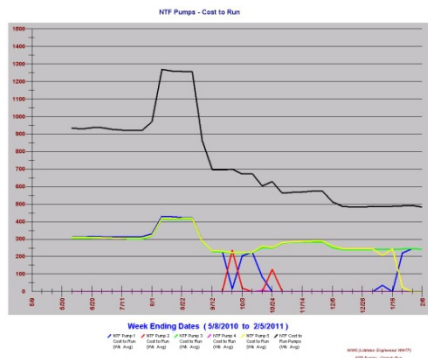


Engineering firms typically ask for 10 years' worth of data. "Before, I don't even think we could have done that. Now we just click a few buttons and email it off to them," said Farmer.

### REFOCUSING RESOURCES

WIMS quickly reduced data entry time among several employees by 32 hours a week allowing LEWWTP to refocus those employees on more strategic initiatives. A plant expansion to increase flow capacity and denitrification generated 10 times more data. WIMS' automated data entry made it possible to gather and analyze the additional data without increasing resources.

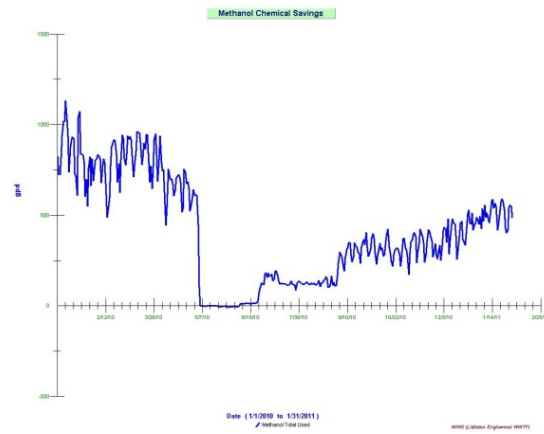
Today, the plant is able to spend 25 percent of its time on strategic analysis looking for opportunities to increase cost savings, which is something it did not have the time to do with the manual process.



### OPTIMIZING PLANT OPERATIONS

Diving into the electrical usage through the WIMS dashboard, Farmer started turning pumps on and off and monitoring the kilowatt draw. By systematically testing the operations and configurations, he was able to optimize the equipment's performance and immediately wrote these new processes into the plant's standard operation procedures. "In just the last three-four months we've made changes that save \$70,000 annually.

In a power optimization project, LEWWTP found tweaking the pumps on the nitrifying trickle filters and turning one pump off reduced the plant area electrical pull from 10,500 kW h (kilowatt hour) to 8500 kW h in that section of the plant, saving approximately 2,000 kW h per day—a savings of \$142 per day. This adds up to an annual savings of \$52,000 while maintaining the same level of treatment.



Littleton/Englewood now includes a denitrification process in its plant that uses methanol. The plant had been using nearly 900 gallons of methanol a day in order to perform the task. By monitoring the results with WIMS, they found the plant could operate on only 500 gallons a day with the same output results, providing \$176,000 in annual savings.

### STREAMLINED REPORTING

For a large wastewater treatment plant like LEWWTP, discharge monitoring reports (DMRs) are vital. With WIMS, the task of generating the reports was reduced from 2-3 days to about 30 minutes. Operators can spend just a few minutes looking over the numbers, and if any concerns arise, they can immediately dive into the WIMS audit trail. The audit trail identifies the origin of the data and provides a track all the way back to the supervisor who approved it.

During the 90s, the plant averaged two permit violations a year. When asked how often they deal with compliance issues today, Data Analyst Durkin responded, “It just doesn’t happen.”

### CONFIDENCE IN REPORTING

WIMS offers easy sharing of reports and business information, which keeps employees informed about critical data within the plant. LEWWTP now has increased confidence in the accuracy of their reported information and more efficient and effective internal communications.

#### Dewatering / Centrate Return Calculator

2011		Gallons Dewatered		Gallons to Dewater Remaining for Week	Maximum Daily Dewatering Volume*	Daily Dewatering Target	Target Centrate Return Setpoint	7-Day Average Centrate Returned	Truckloads Hauled		Gallons pumped to Digesters	
		Projected	Actual						Projected	Actual		
Sun, Dec 26,	to Sun, Jan 02,	707,200	648,718	58,482	142,800	134,700	115,000	91,251	17	18	563,410	58,504
Sun, Jan 02,	to Sun, Jan 09,	725,000	725,156	-156	145,600	138,100	118,000	97,437	18	21	559,484	-194
Sun, Jan 09,	to Sun, Jan 16,	689,400	689,587	-187	139,900	131,300	112,000	100,067	17	20	550,709	-208
Sun, Jan 16,	to Sun, Jan 23,	665,300	665,380	-80	136,000	126,700	108,000	92,680	17	19	542,288	-83
Sun, Jan 23,	to Sun, Jan 30,	645,800	645,847	-47	132,900	123,000	105,000	85,601	16	18	530,596	-52
Sun, Jan 30,	to Sun, Feb 06,	683,300	683,443	-143	138,900	130,200	111,000	99,090	17	3		-124
This report generated on		Mon, Feb 07, '11							102	99		

**To use this calculator**

To determine dewatering requirements:  
 The value in Column E is the total number of gallons to dewater for the given week  
 The value in Column F is the total number of gallons dewatered for the given week

To determine centrate return setpoint:  
 The value in Column L is the centrate return setpoint to be entered into SCADA  
 \*Not exceeding this volume ensures that centrate tank doesn't fill up before end of week

For report period			
01/01/2011	to	01/31/2011	2,731,926 Gallons to Digesters
01/01/2011	to	01/31/2011	3,374,688 Gallons dewatered

#### Projected vs Actual Dewatering

The chart shows projected (green bars) and actual (blue bars) dewatering volumes. For week 1, both are around 800,000 gallons. For week 3, both are around 900,000 gallons. For week 5, the projected volume is around 200,000 gallons, while the actual volume is around 900,000 gallons.

## Summary

Hach WIMS provided LEWWTP with the ability to greatly improve operations while saving time, energy and money. WIMS provides the tools to monitor and analyze the overall system.

- Zero permit violations
- ~240 hours freed from data capture and reporting activities
- Energy savings: \$122,000/year
- Methanol savings: \$176,000/year
- Data entry savings: At least 32 hours/week
- Tighter construction specifications saves "over-building" costs
- Refocused time spend from data entry to strategic analysis to improve operations and costs

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