

CASE STUDY

CITY OF MILPITAS

City of Milpitas Tames Nitrification While Reducing Energy Costs with Automated Disinfectant Residual Control System



OVERVIEW

Located in the southern-most region of the San Francisco Bay Area, the City of Milpitas hosts a widely diverse, ever-growing population of over 70,000 residents. With nearly 15 square miles of land nestled just alongside San Jose, another massive city in the Bay Area, the need for readily-available, clean water is always present for the thousands of families living there.

Milpitas grapples with water quality challenges derived from multiple water sources, a warm climate, and periods of water conservation. In the past, the City operations staff, would toggle between pumping and filling water from the North Tank (5 MG of water from Santa Clara Valley) and the South Tank (5 MG of water from San Francisco) to meet system needs. They utilized an aggressive fill and drain cycle to ensure that nitrification risk was minimized, and disinfectant residual concentration was maintained.

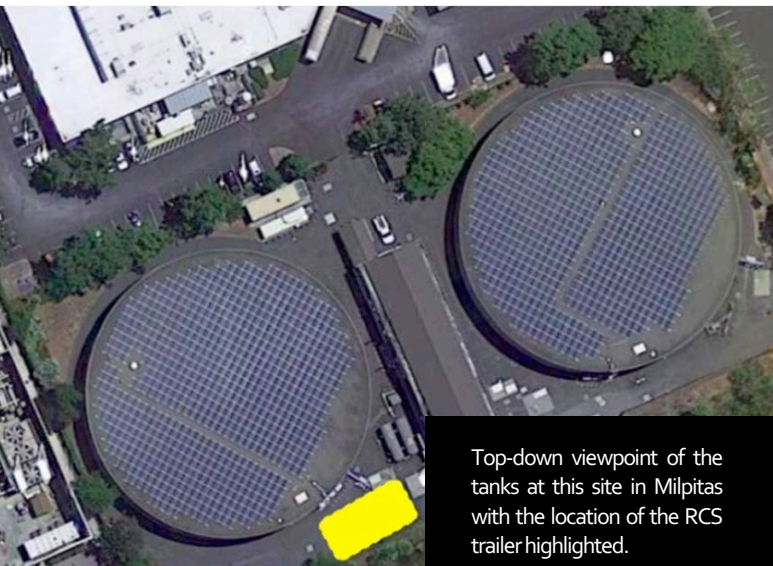
The City of Milpitas' water system utilizes over 11 million gallons of water per day through roughly 205 miles of underground water pipes constructed throughout the city.

SITUATION

The City operations staff had settled into a routine of frequent testing, manual boosting of residual and an energy intensive process of tank cycling (~4 MGD of turnover) to ensure that water age was minimized. In the past, Glen Campi, Public Works Maintenance Manager, had directed an engineering firm to specify and install an automated residual management system that used traditional ammonia and chlorine analyzers to identify degrading water chemistry on a real-time basis.

Unfortunately, the system was not able to actively manage the dynamic nature of water quality changes in the Milpitas tanks because they lacked an algorithm that could instantaneously match testing data with conditions in the tanks.

The team set forth to find a solution that would meet all their needs.



Top-down viewpoint of the tanks at this site in Milpitas with the location of the RCS trailer highlighted.

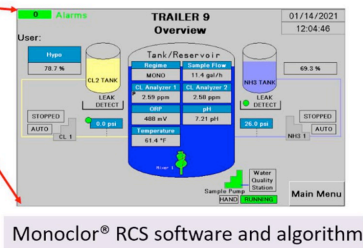
APPROACH

In their search for a more robust solution, City staff became aware of the Monoclor® RCS chloramine management system that were currently in use at other Bay Area water utilities. To test it out, the City installed a Monoclor® RCS pilot trailer at the Gibraltar booster pump station. They set-up the pilot so that the system could treat water in both tanks - one supplied with water from SFPUC, the other with water from Valley Water.

The pilot trailer was equipped with a Microclor® On-Site Sodium Hypochlorite generator that can generate 60 pounds-per-day of chlorine equivalent for system boosting as needed. Ammonia was supplied in the form of LAS (liquid ammonium sulfate – a safe form of ammonia salt) to allow for the generation of monochloramine in the tanks.



Above is the RCS trailer on site and connected to the tank



Monoclor® RCS software and algorithm

CONCLUSION

The Monoclor® RCS system was able to efficiently and automatically analyze and adjust the residual levels to the desired set point chosen by the City operator, which in turn helped Milpitas achieve their desired water quality standard goals. In comparison to their previous tools, the Monoclor® RCS system was able to not only save the team in energy costs, but also precious time and money. The team saw a 70-80% reduction in energy use in addition to meeting their water quality goals as a result of the new system.

To ensure that clean water could consistently be achieved, the City team invested in four permanent Monoclor® RCS systems throughout the city.

RESULTS

70-80%

REDUCTION
In Energy Use

- A third-party energy management firm calculated that the site enjoyed a 70-80% energy use reduction due to the phasing-out of the energy intensive tank cycling.
- The Monoclor® RCS system was reliable and predictable. Once the City team set a nominal residual level in the PLC, the RCS system automatically kept the residual level between the control limits automatically.
- The new system also reduced the labor required to manage the tanks. Frequent visits, manual analysis, manual residual level adjustments and tank cycling were reduced dramatically.

"The Monoclor® RCS has given us control over our residual levels, eliminated nitrification and the need for manual boosting in our system and is saving us a lot in energy costs. The project has been a huge success and we are excited to move to a permanent system in the future."

-Glen Campi, Public Works Maintenance Manager for Utilities, City of Milpitas

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