

# CASE STUDY

## Municipal Water Plant Realizes System Optimization, and Savings in Energy and Membrane Replacement



**STABILIZED  
SYSTEM  
OPERATION**



**\$12,295**

Annual Energy  
Savings



**\$60,000**

Membrane  
Replacement  
Savings

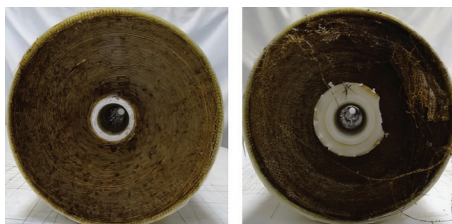
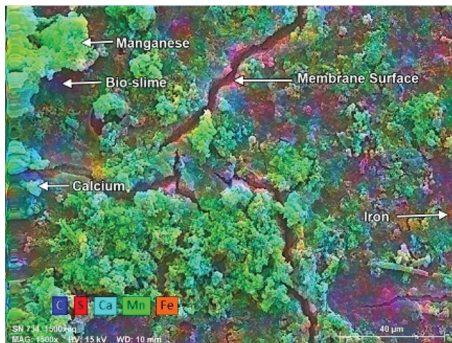
### 1 KEYWORDS

Cleaning, Nanofiltration, Municipality, RoClean™ P192, RoClean™ P903, Vitec™ 5100

### 2 BACKGROUND

A municipal drinking water plant in Ohio was equipped with two nanofiltration (NF) skids, each designed to produce a 260-275gpm permeate flow at 79% recovery. The customer faced a persistent loss in permeate flow despite regular cleanings using a generic cleaning chemical. Membranes from one of the NF skids were prematurely replaced due to severe chemical damage during a flux recovery attempt using the generic cleaning formulation. The membrane replacement was valued at approximately \$60,000.

### 3 APPROACH/ACTION

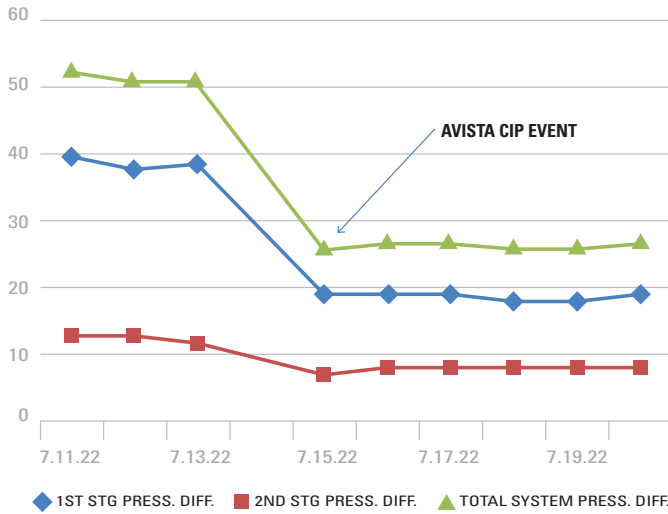


CEI imaging (top) and scroll ends (bottom) of the lead element autopsy results pictured below.

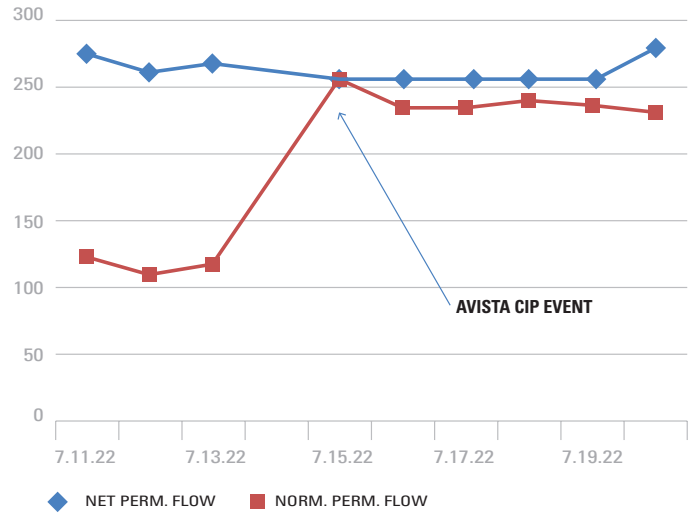
Autopsies on two membranes from the skid revealed iron and manganese. The lead element also showed severe, non-oxidative chemical damage. Based on these results, RoClean P192 and RoClean P903 were recommended. Both elements were successfully cleaned with 2% solutions of RoClean P192 (high pH) followed by a 2% solution of RoClean P903 (low pH), heated to 35°C. The tail element was full recovered, however, the lead element's rejection could not be fully recovered due to previous chemical damage.

The customer continued to see success after switching to RoClean P192 and RoClean P903 on the 2nd NF skid cleaning trial. The city also transitioned from a competitor's antiscalant to Vitec™ 5100 to ensure better dispersion of metals and scale prevention.

## DIFFERENTIAL PRESSURE



## NORMALIZED VS. NET PERMEATE FLOW



Graphs above show a drop in differential pressure (left) and normalized permeate flow increase (right) once the recommended cleaning procedure was implemented.

## 5 CONCLUSION

- The customer saved approximately \$60,000 by recovering the membrane system performance after cleaning with RoClean P192 and RoClean P903.
- An annual average energy savings of \$12,295 was achieved with the lower net driving pressure profile.
- An annual power savings of 111.8 MWhr per year was achieved.
- Stabilized system operation was achieved due to the addition of the Vitec 5100 antiscalant.

### GLOBAL HEADQUARTERS

Avista | Center of Excellence  
 Avista Technologies, Inc.  
 140 Bosstick Boulevard  
 San Marcos, California 92069  
 info@avistatech.com  
 ☎ +1 760 744 0536



AvistaMembraneSolutions.com

