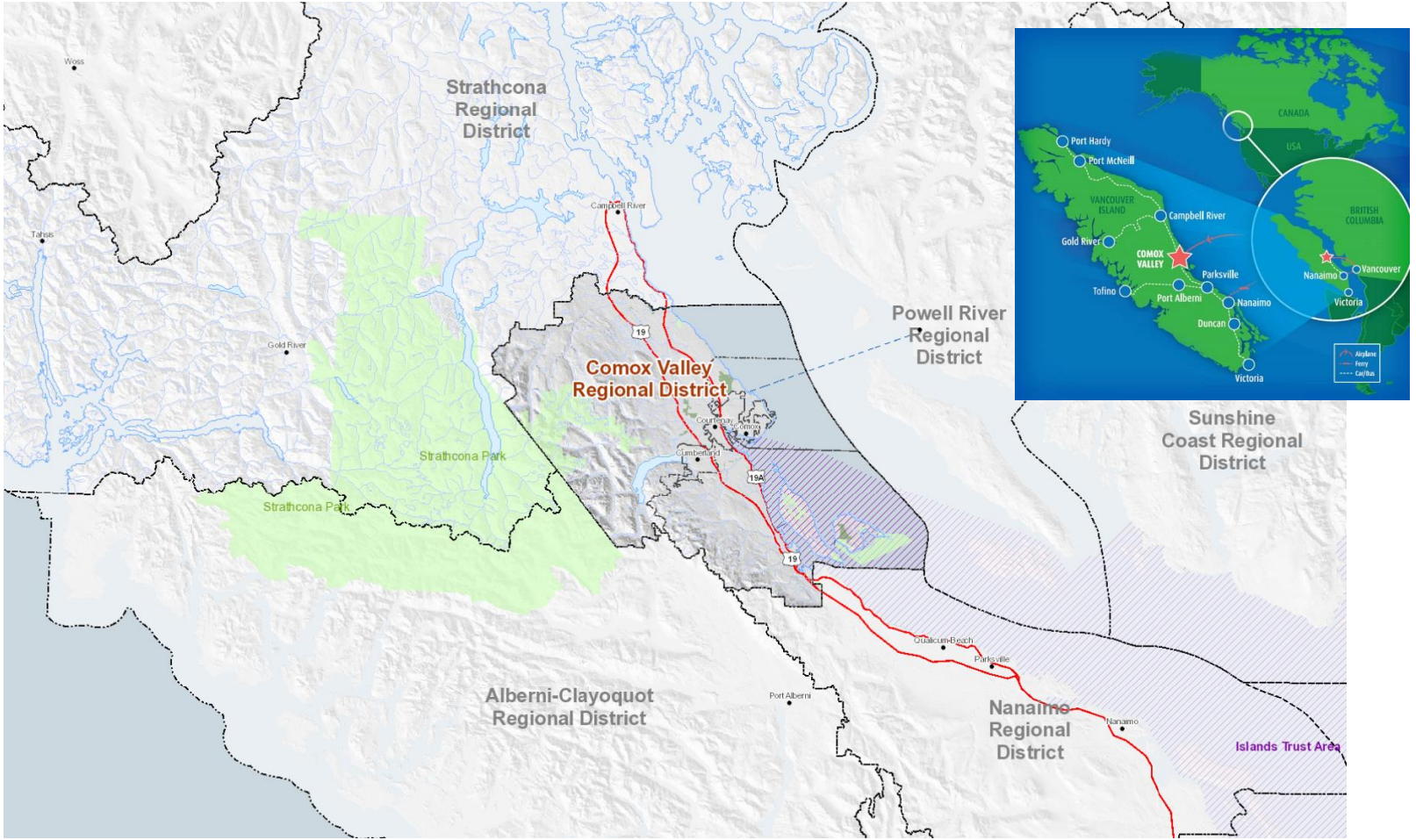
SCADA Data Across the Enterprise

Presented by **Brian Pearson**
Senior Manager of Information Systems & GIS

Comox Valley Regional District



Comox Valley Regional District

- Local regional government for 3 municipalities and 3 rural areas
- Manage major utilities – Water, Sewer, Solid Waste
- Population of 65,000
- 27 remote sites throughout the Comox Valley

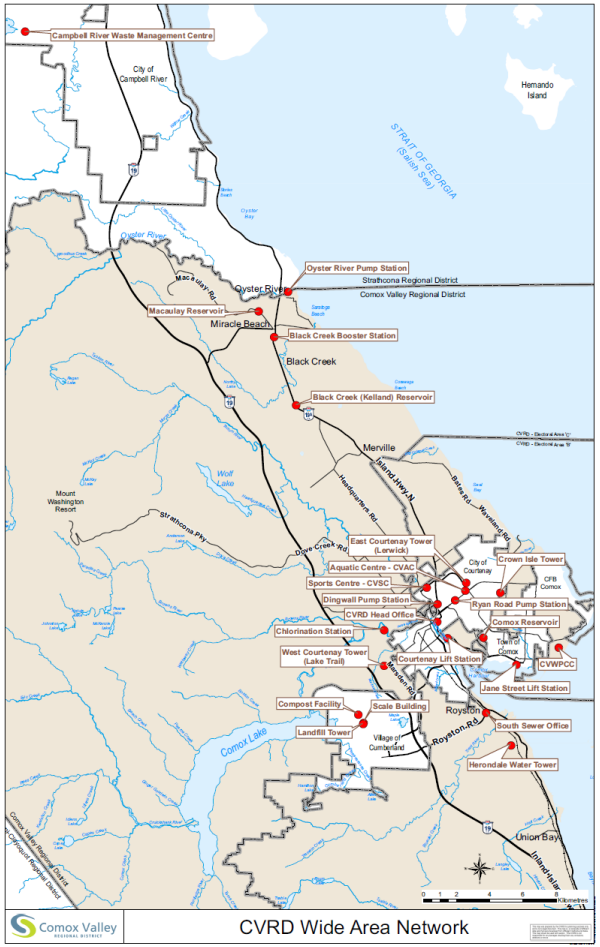
Overview

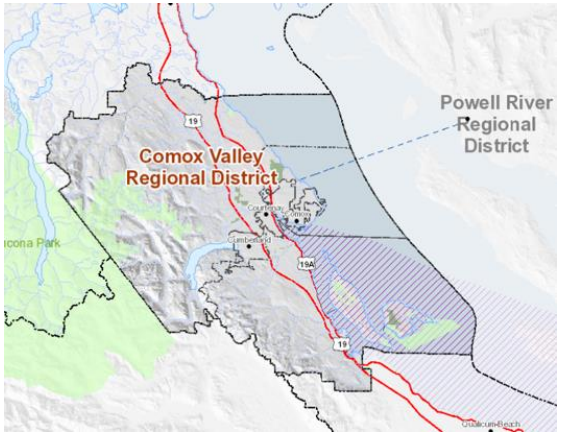
- Business Challenges
- Existing systems and how data collection worked in past
- Implementation of network and data connections
- Integration of the PI System®
- Integration of PI Coresight™ and PI ProcessBook®
- Changes to systems and how staff work
- Outcomes and future directions with data integration

Business Challenge

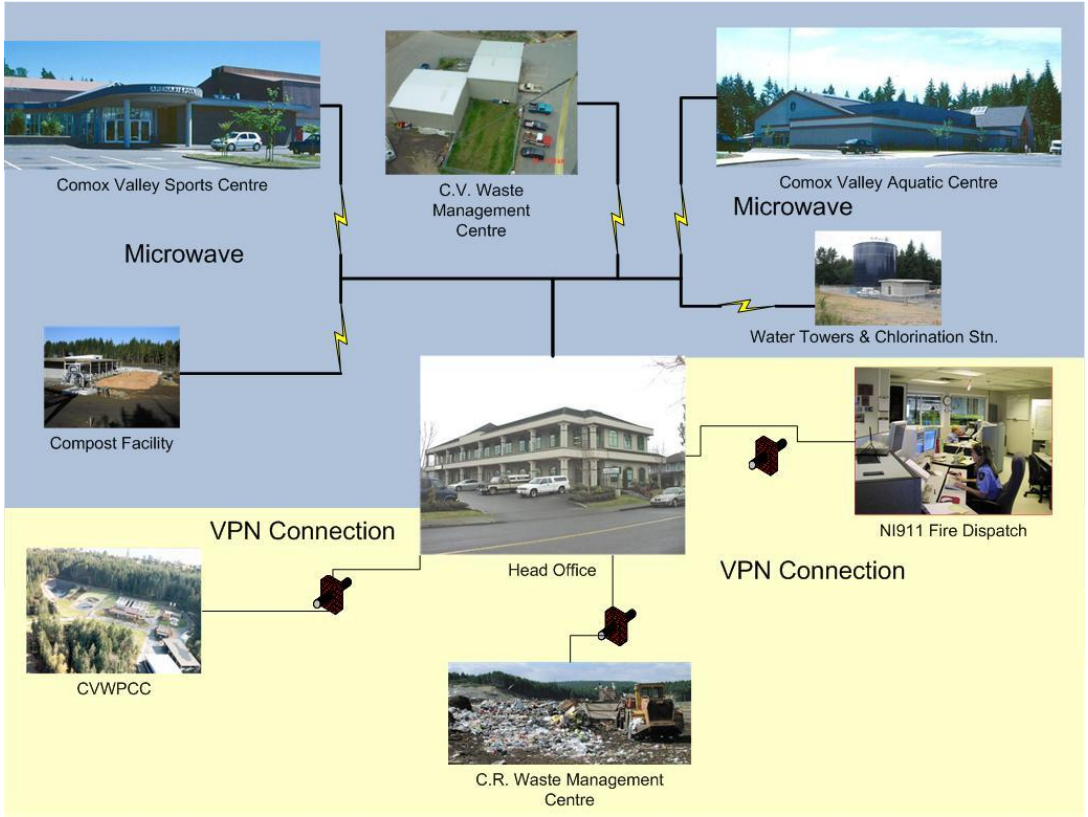
- Bring all data from remote water, sewer and Solid waste stations to central office
- Large distances between sites makes local data analysis impossible
- Need to centrally store and analyze data from remote sites in real time
- Many staff members in several departments need to view and monitor collected data and systems
- Increase efficiencies in time, labour and costs to access data and to control remote systems

27 remote sites throughout the Comox Valley





CVRD Wide Area Network



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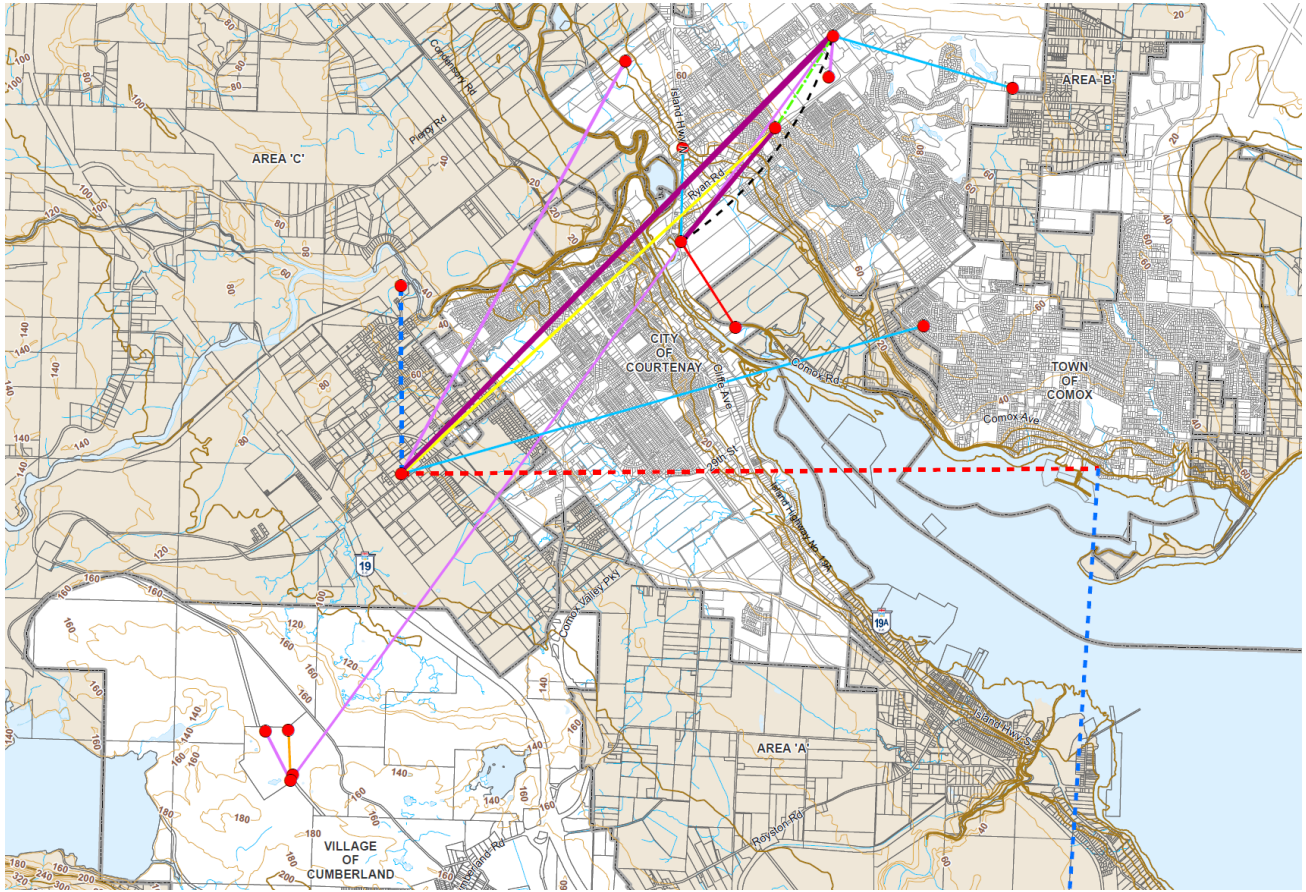

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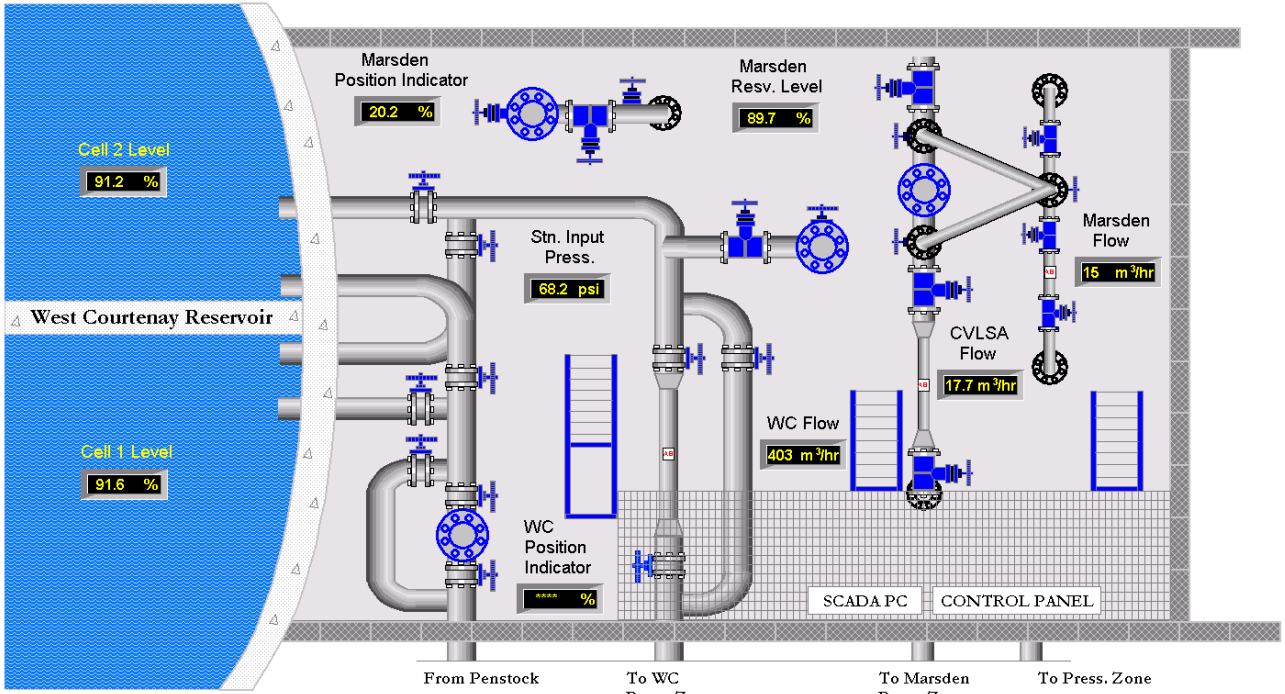


User Logged In : JAMES

SCADA Selection Screen

West Courtenay Trending

West Courtenay Alarm Summary

HELP !

Please Logout

West Courtenay Setpoints

West Courtenay Timers

Comox Valley Regional District

10 psi WC Low Input Pressure Alarm

5 m³/hr WC Low Flow Alarm

5 % WC Position Indicator Max. open before Alarm

5 % WC Position Indicator Min. open before Alarm

hold the alt valve position on marsden | 19.00 | Enter

98 % Cell 2 - Hi Level Alarm

95 % Cell 2 - Stop Fill

87 % Cell 2 - Start Fill

50 % Cell 2 - Low Level Alarm

98 % Cell 1 - Hi Level Alarm

95 % Cell 1 - Stop Fill

87 % Cell 1 - Start Fill

50 % Cell 1 - Low Level Alarm

96 % Alarm - Hi Reservoir Level

93 % Marsden Stop Fill

85 % Marsden Start Fill

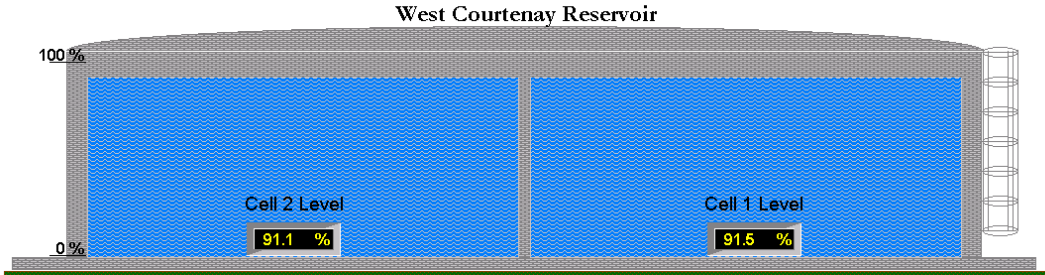
50 % Alarm - Low Reservoir Level

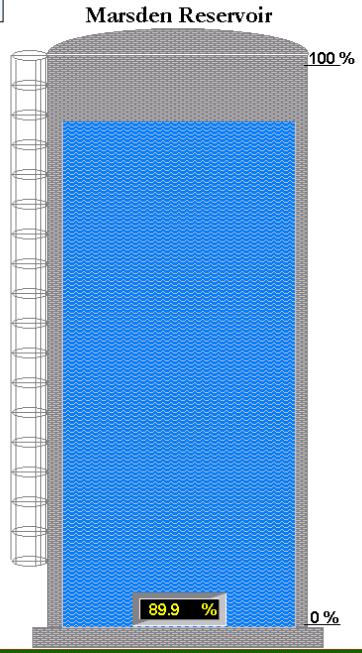
98 Marsden Hi Pressure Shutdown

50 Marsden Low Pressure Alarm

5 % Marsden Position Indicator Max. open before Alarm

6 % Marsden Position Indicator Min. open before Alarm



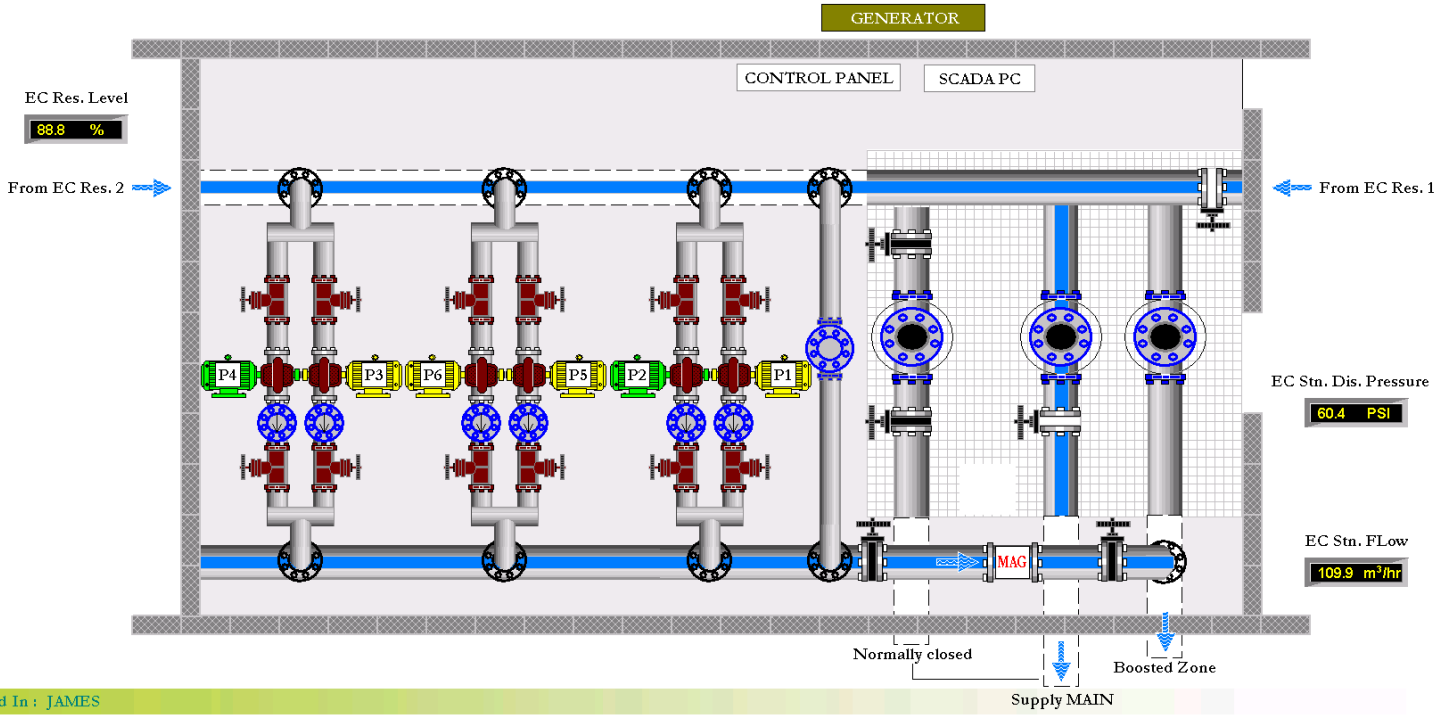


Close Setpoints

172.16.100.141

East Courtenay Station - Station Overview

Comox Valley Regional District



User Logged In : JAMES

SCADA Selection Screen | East Courtenay Trending | East Courtenay Alarm Summary | Please Logout | Idle in 9:56 | East Courtenay Pumps Data | East Courtenay Setpoints | East Courtenay Timer | HELP !

Original
chart recorders for
data collection

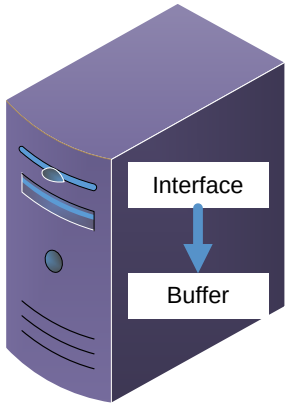
PI System® – PI Server™

Standard Configuration at Remote Sites

PLC – Allen Bradley
SLC 505 or
CompactLogix

Data

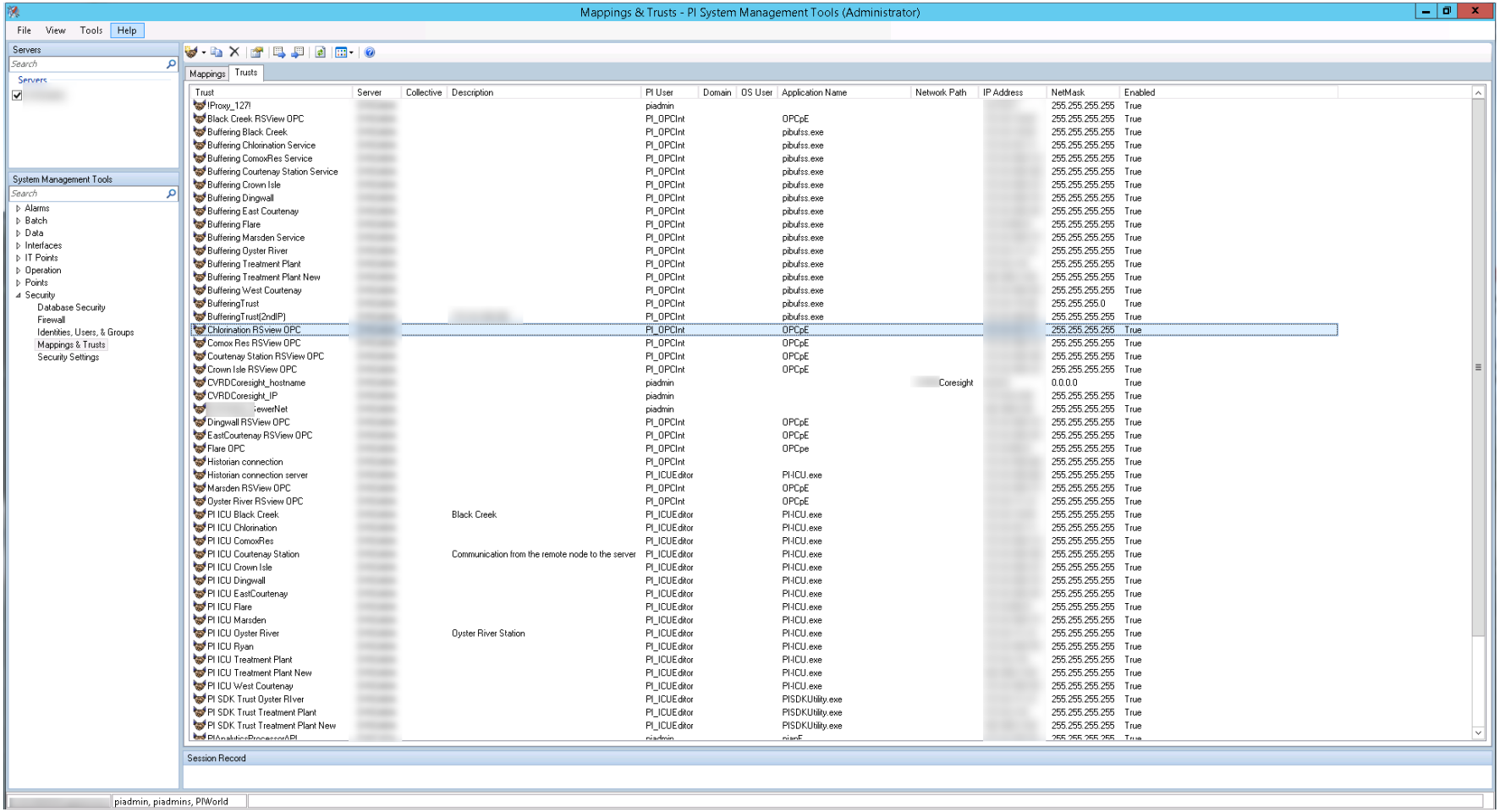
Interface Node



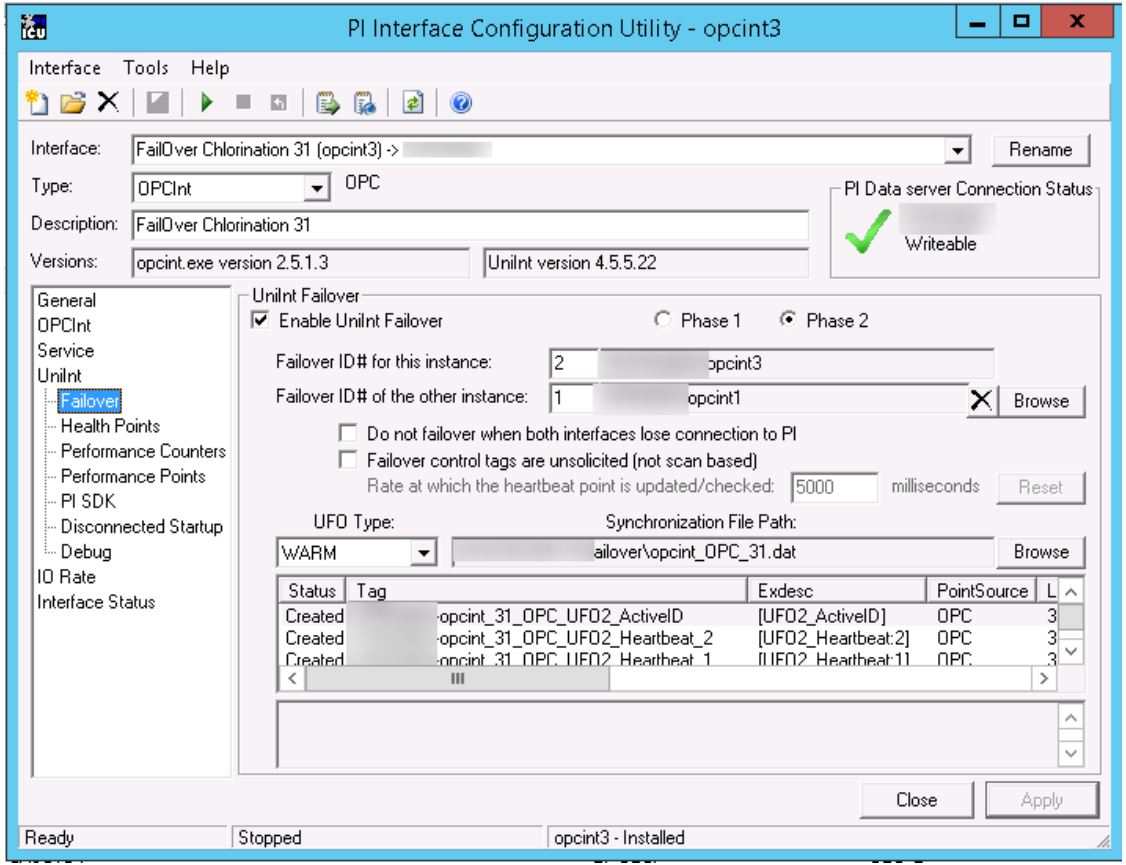
Rockwell – RS Logix/RSView 32
Factory Talk SE

Pi Server

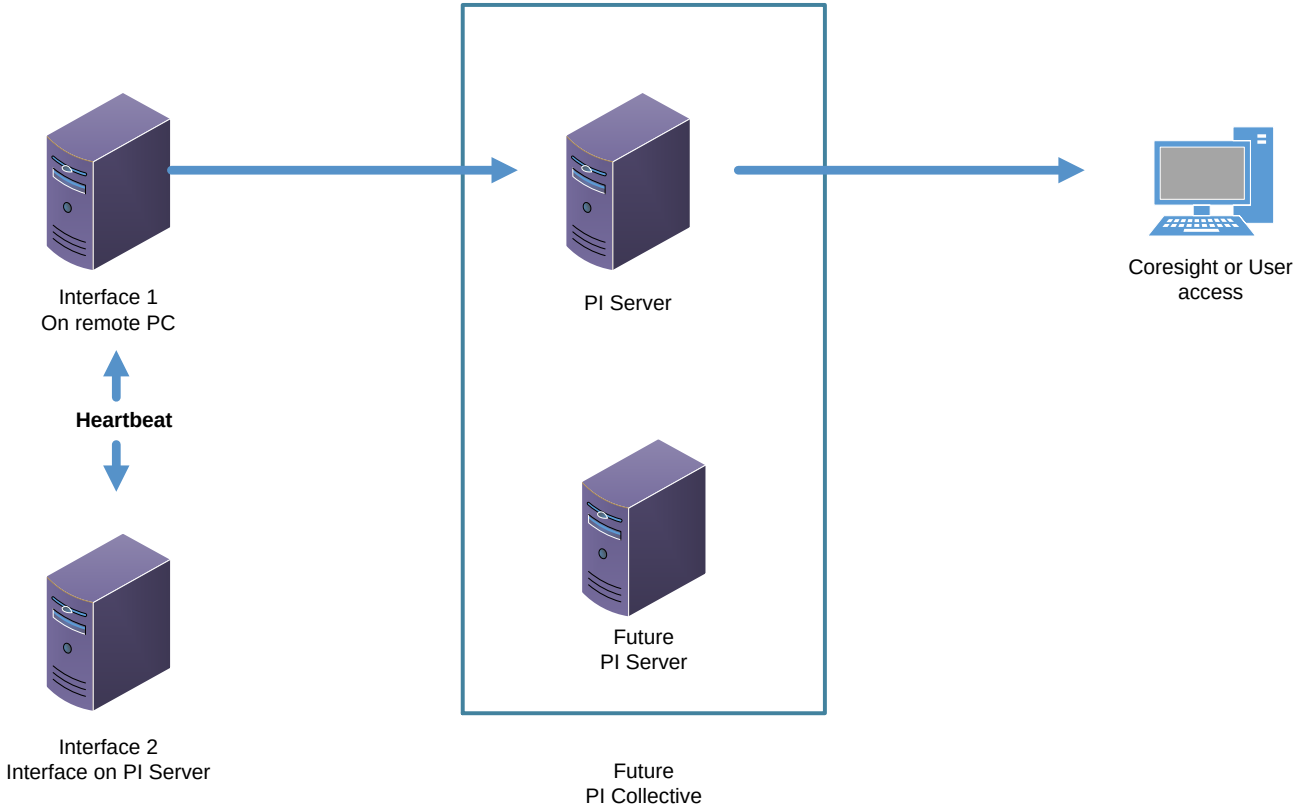
PI Server at Head Office



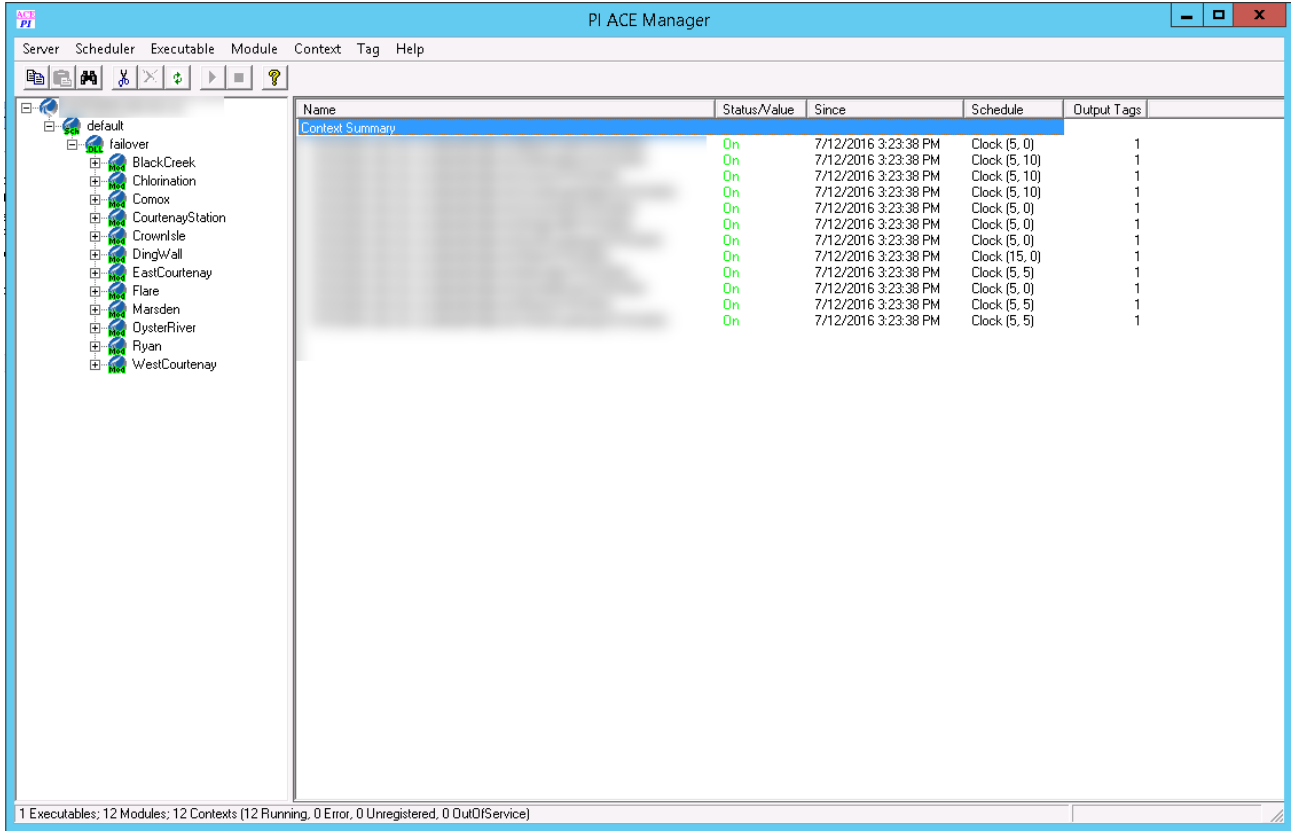
PI System Interface Failover



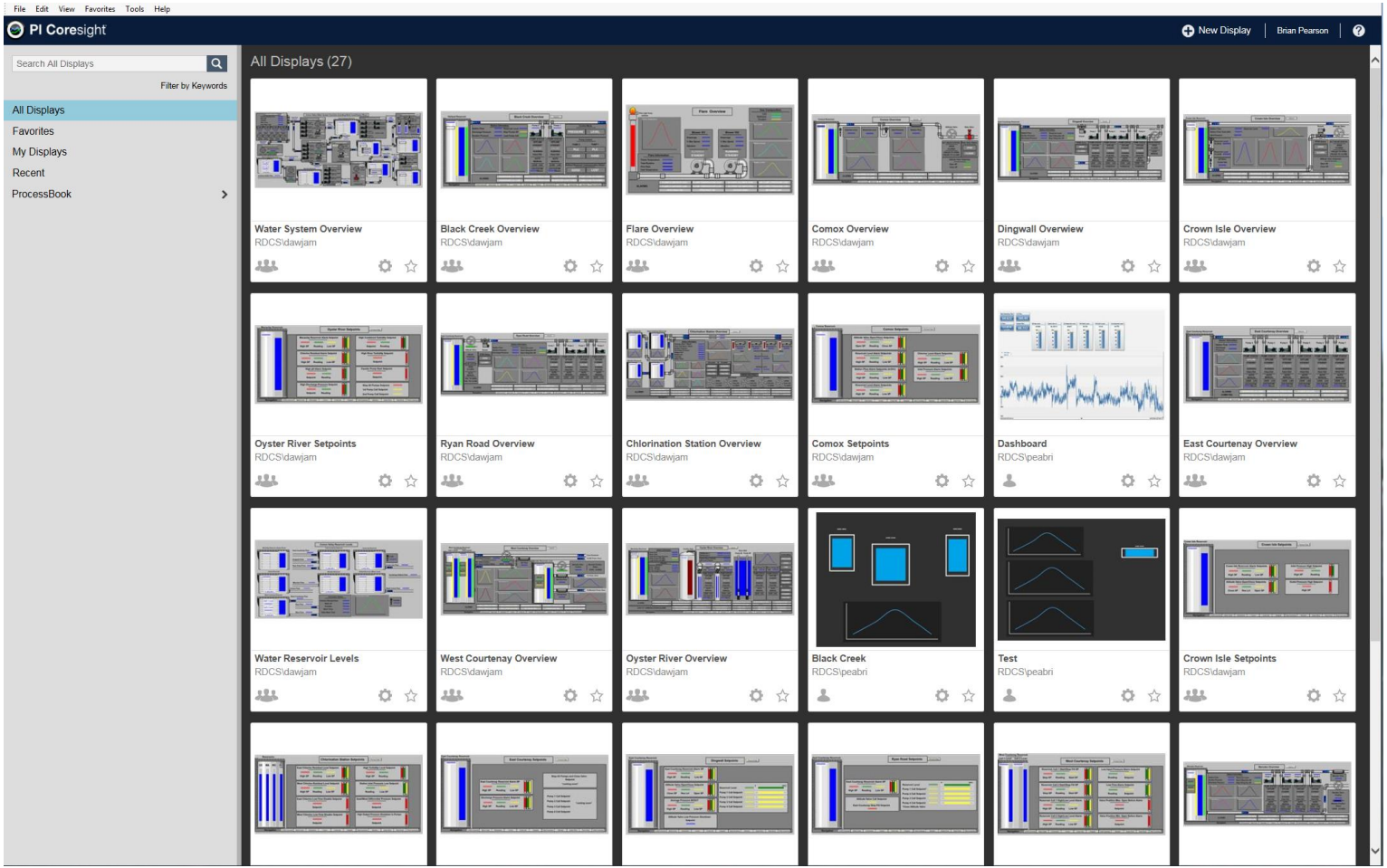
Failover and High Availability (HA)

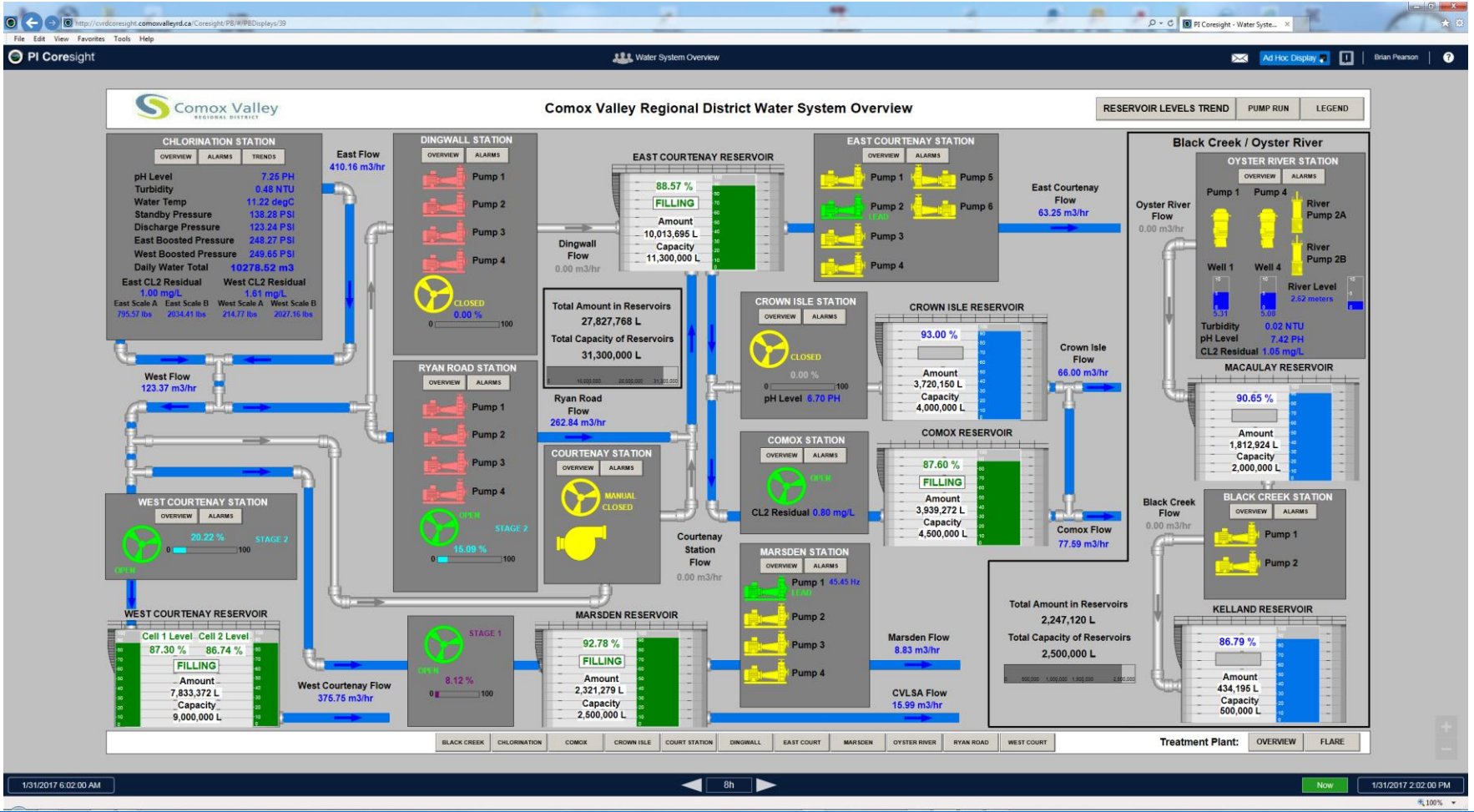


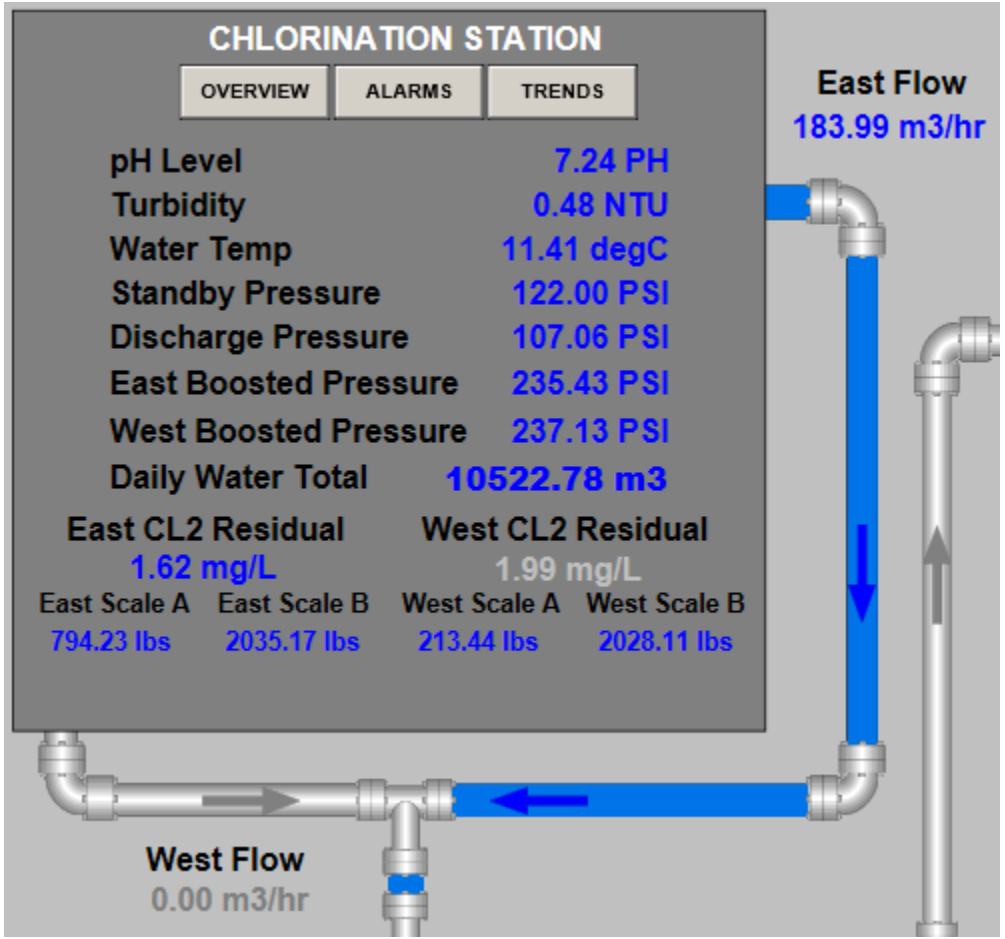
Advanced Computing Engine (ACE)

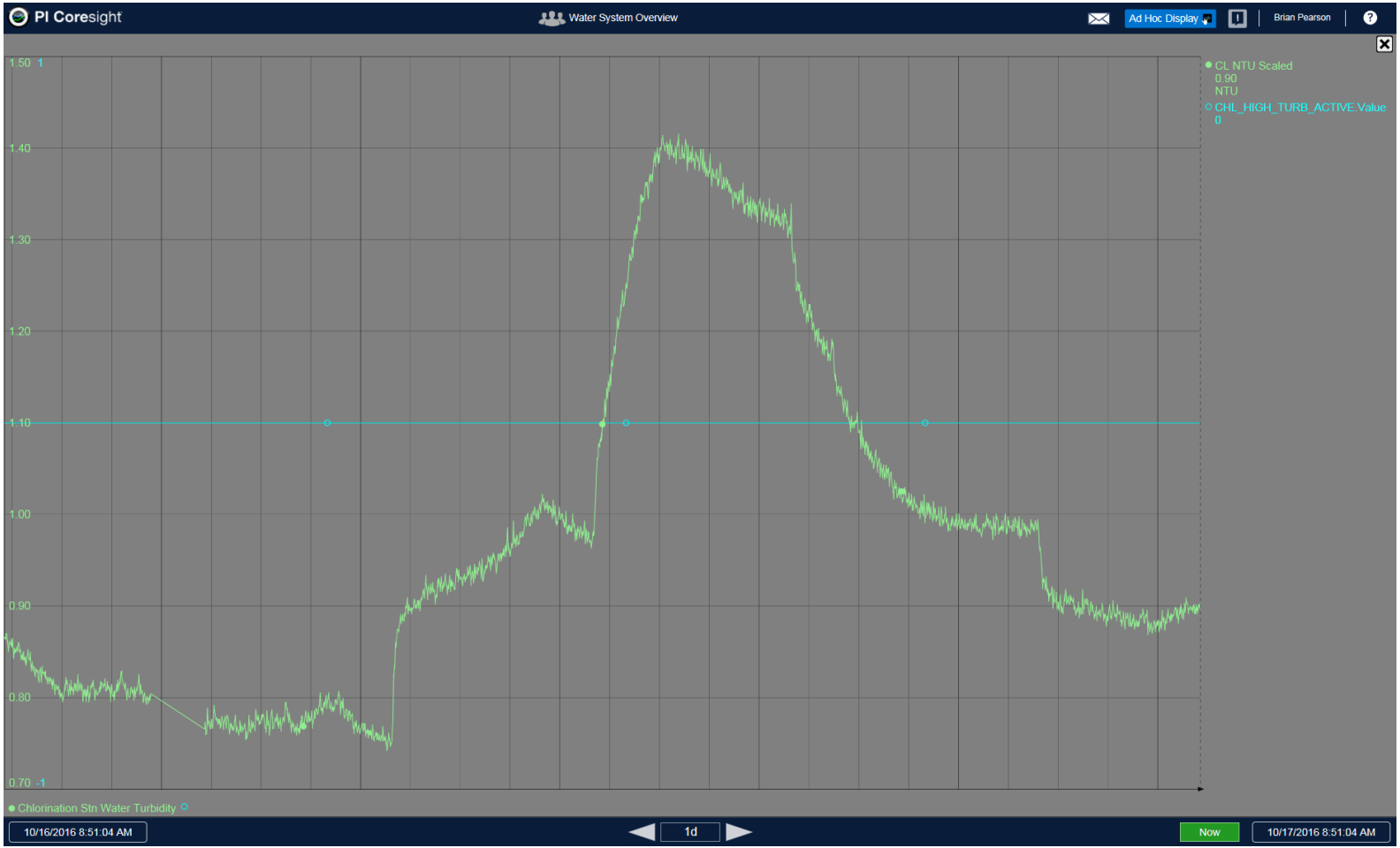


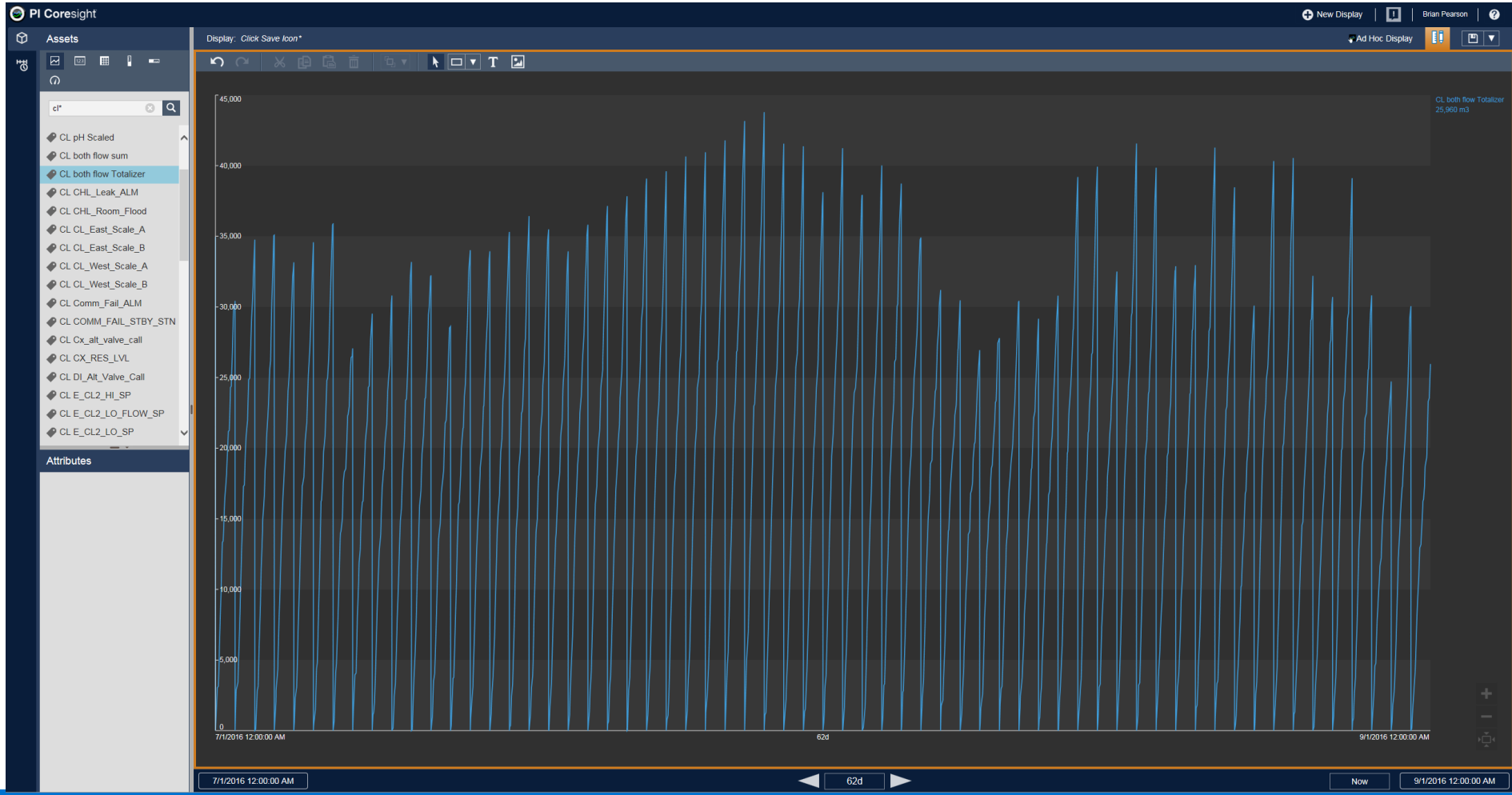
PI Coresight™
and
PI ProcessBook®
Visualization

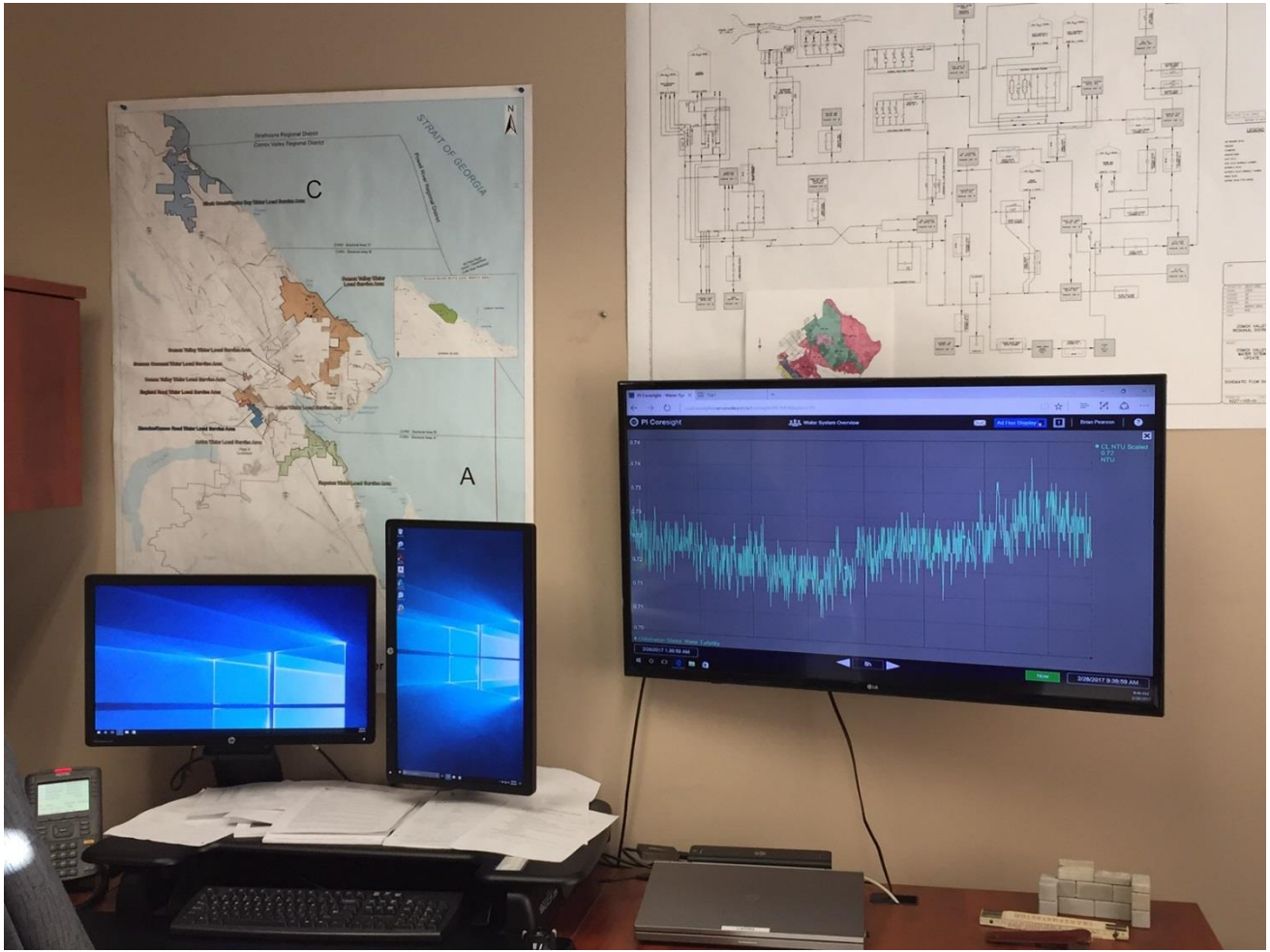


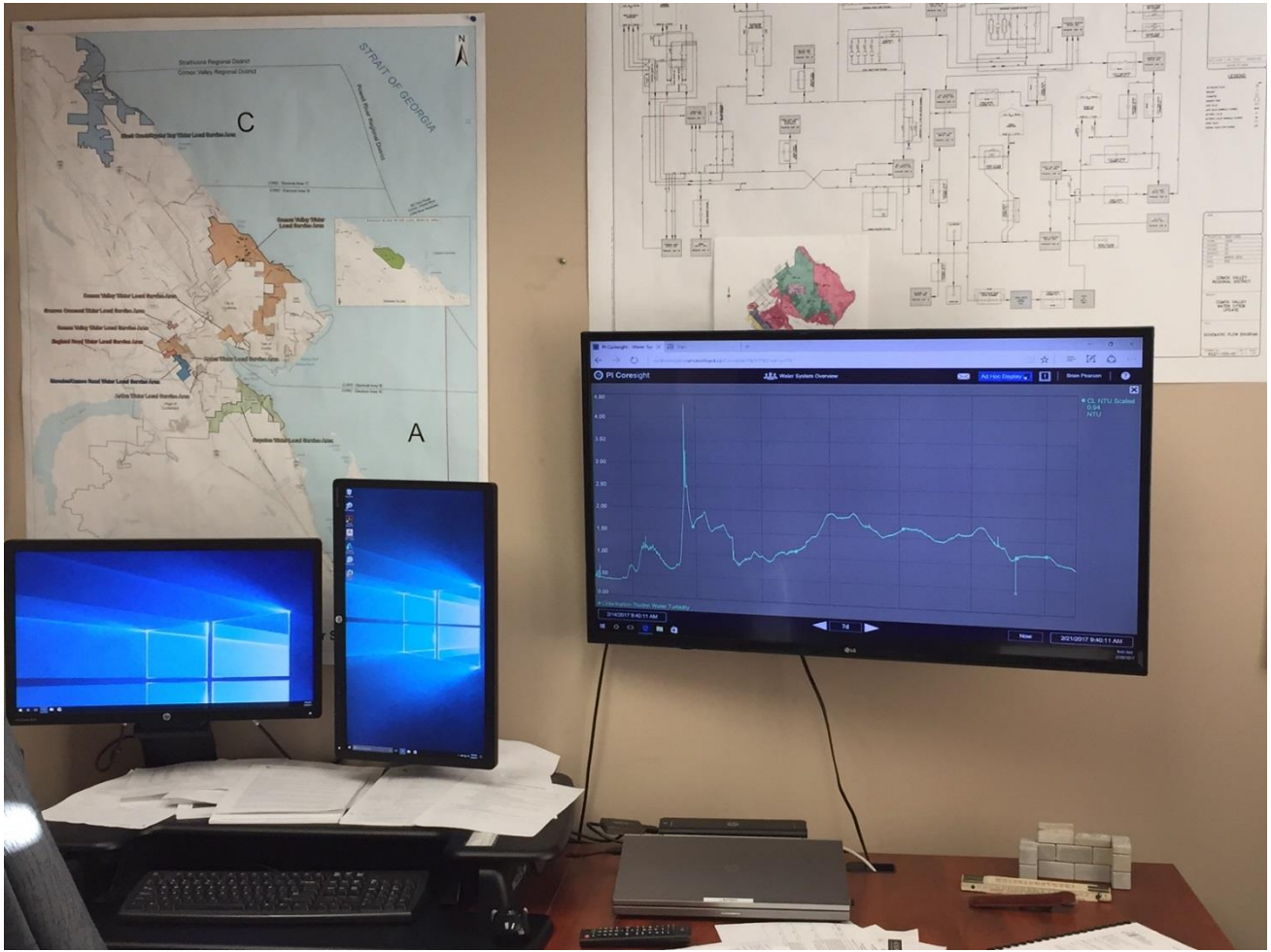


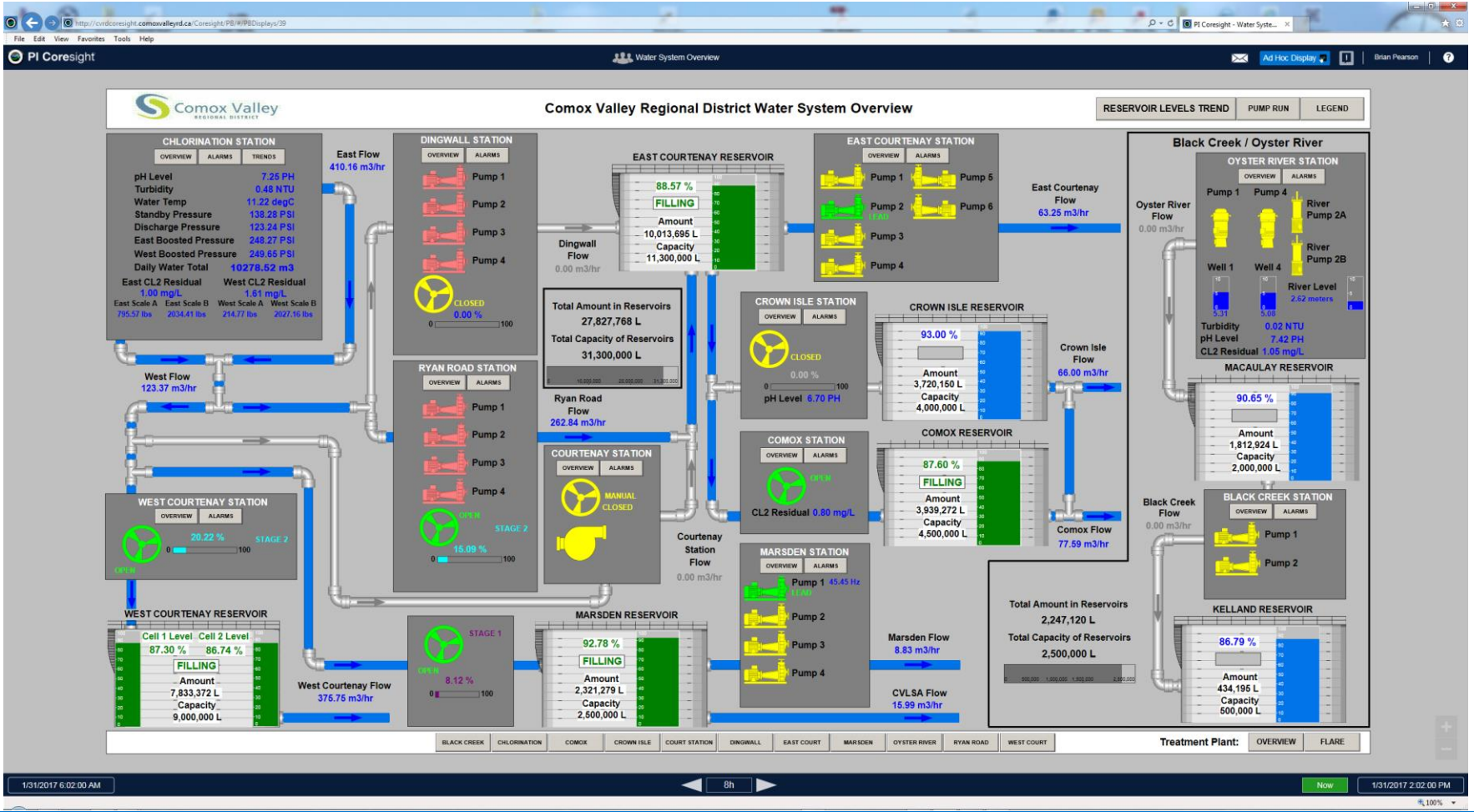


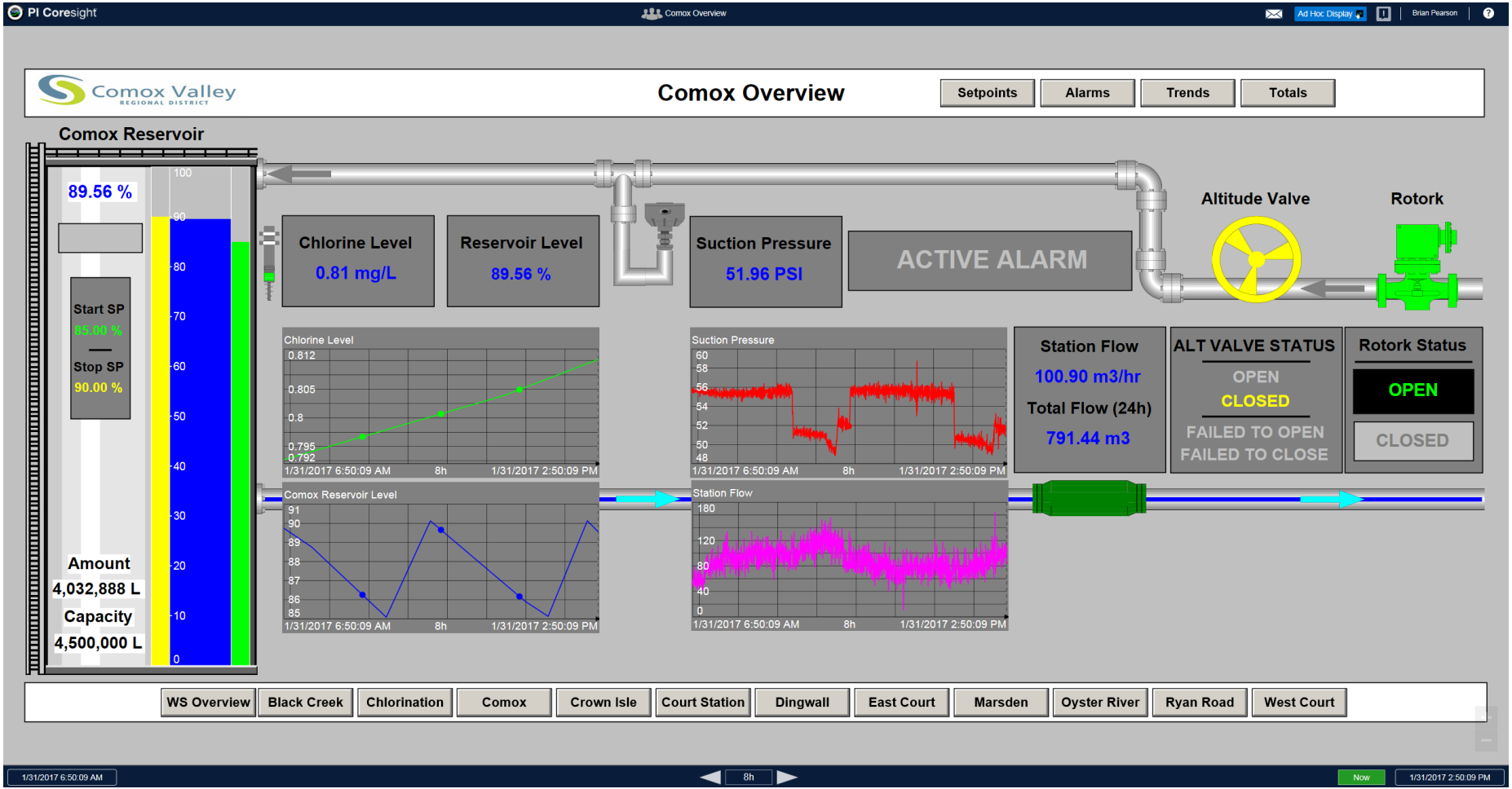


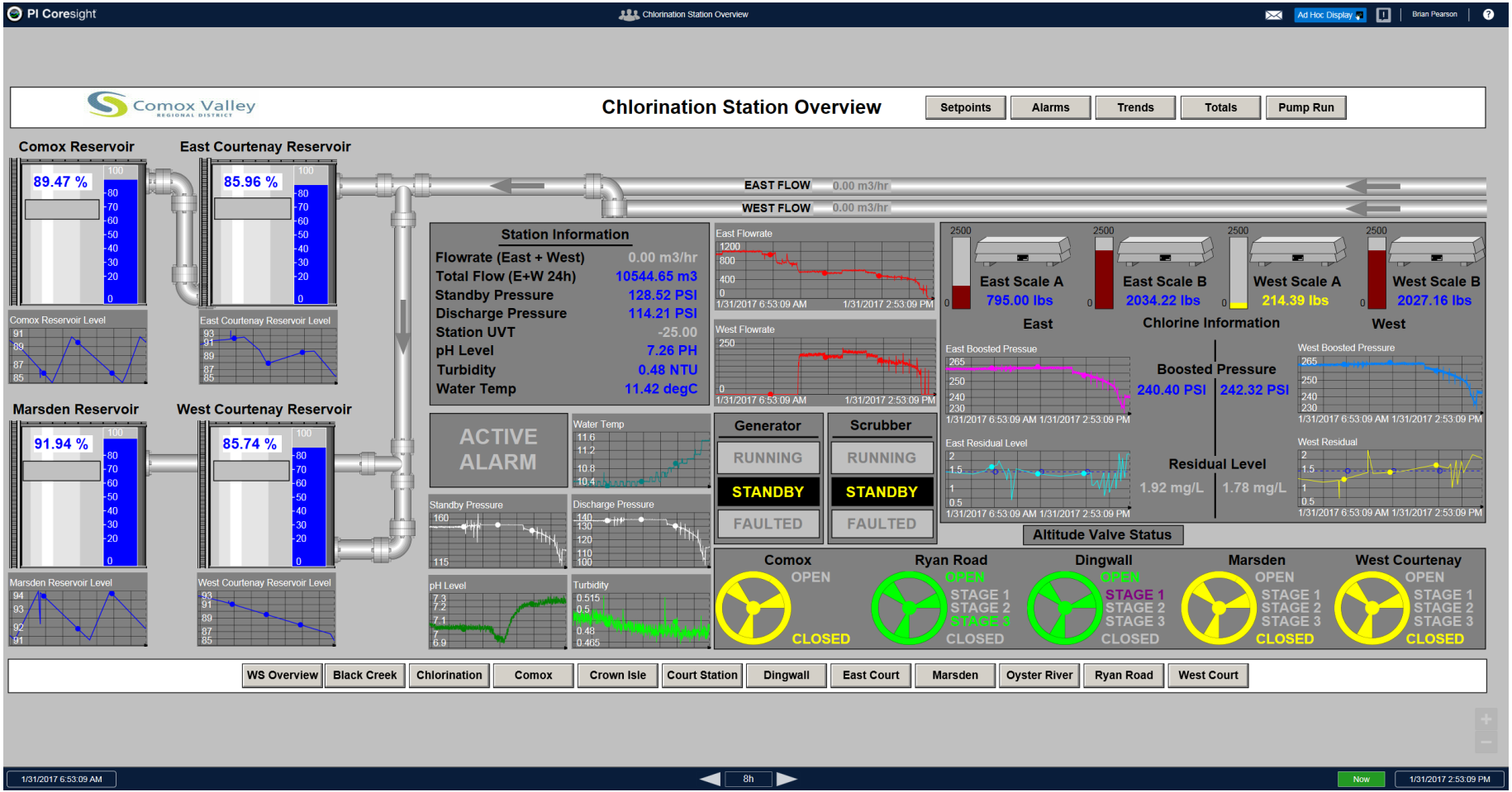










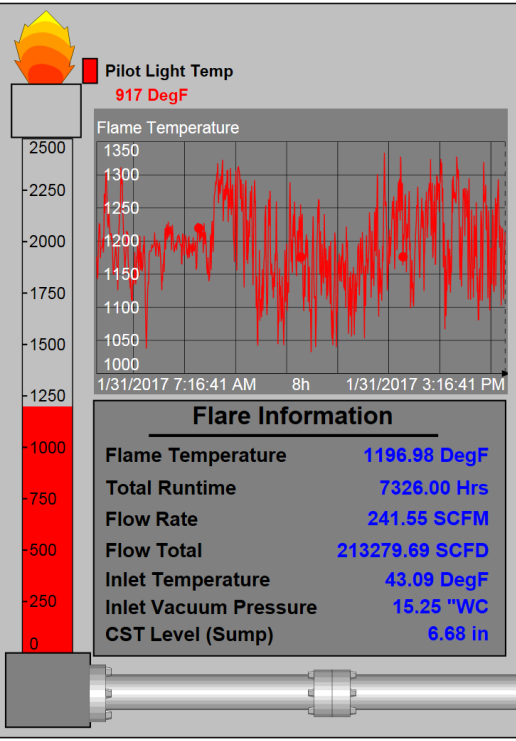


Comox Valley Regional District

Flare Overview

Alarms

Pilot Light Temp
917 DegF



Flare Information

Flame Temperature	1196.98 DegF
Total Runtime	7326.00 Hrs
Flow Rate	241.55 SCFM
Flow Total	213279.69 SCFD
Inlet Temperature	43.09 DegF
Inlet Vacuum Pressure	15.25 "WC
CST Level (Sump)	6.68 in

Blower 301

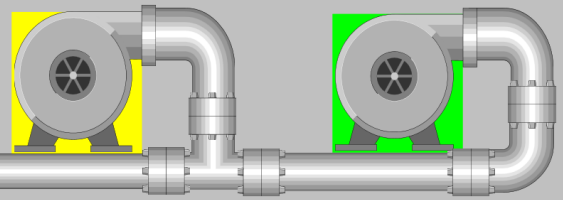
Amperage	0.00 A
% Max Speed	0.00 %
Vibration	0.01 In/S

RUNNING
STANDBY

Blower 302

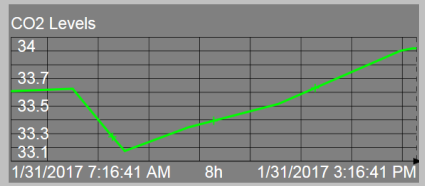
Amperage	8.41 A
% Max Speed	41.12 %
Vibration	0.14 In/S

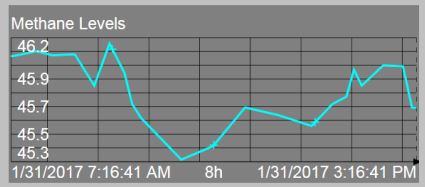
RUNNING
STANDBY

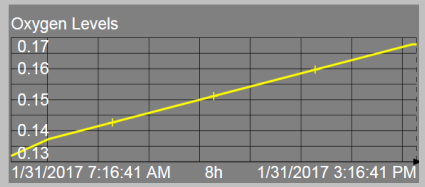


Gas Composition

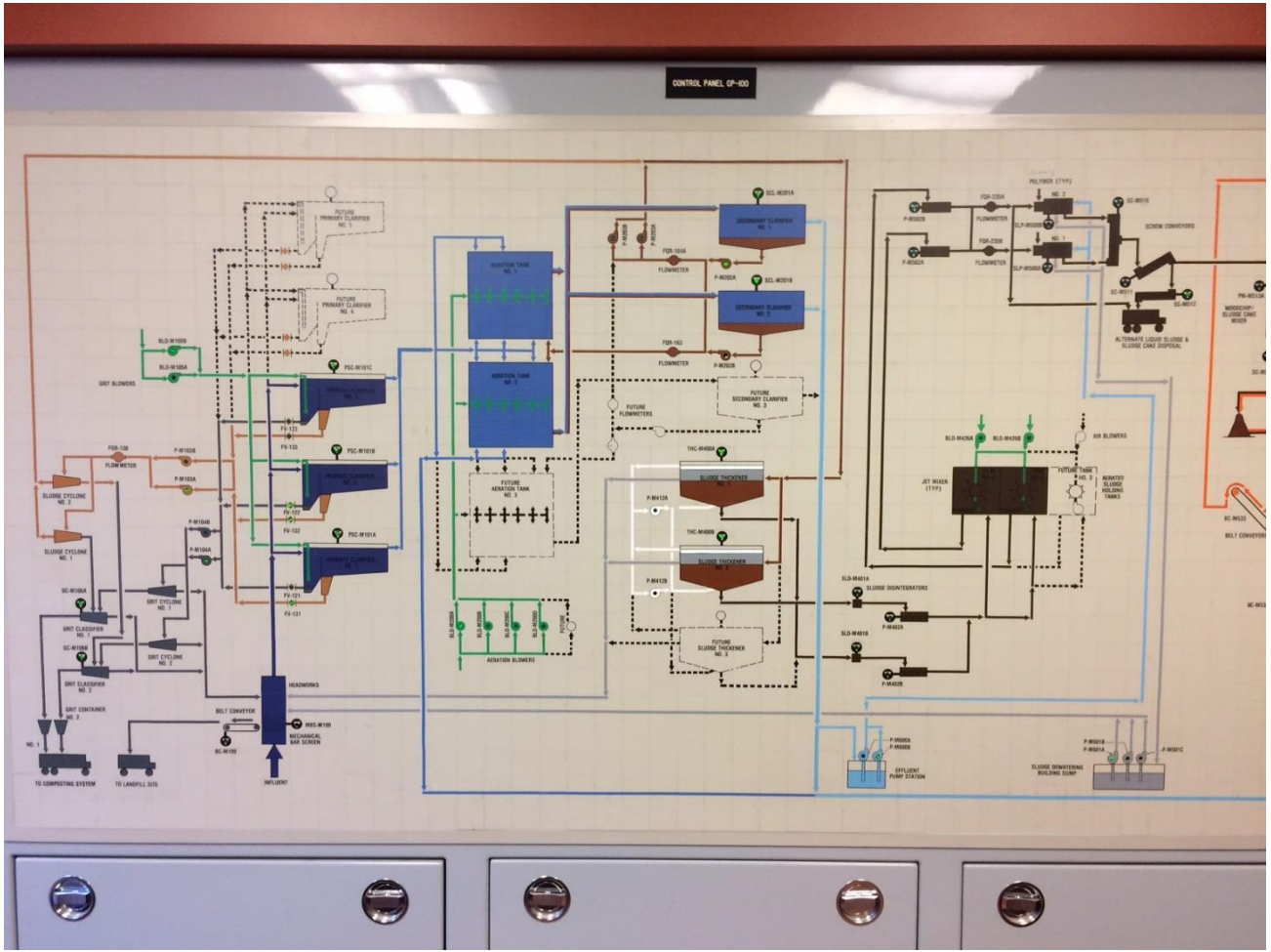
C02	33.92 %
Methane	45.69 %
Oxygen	0.17 %

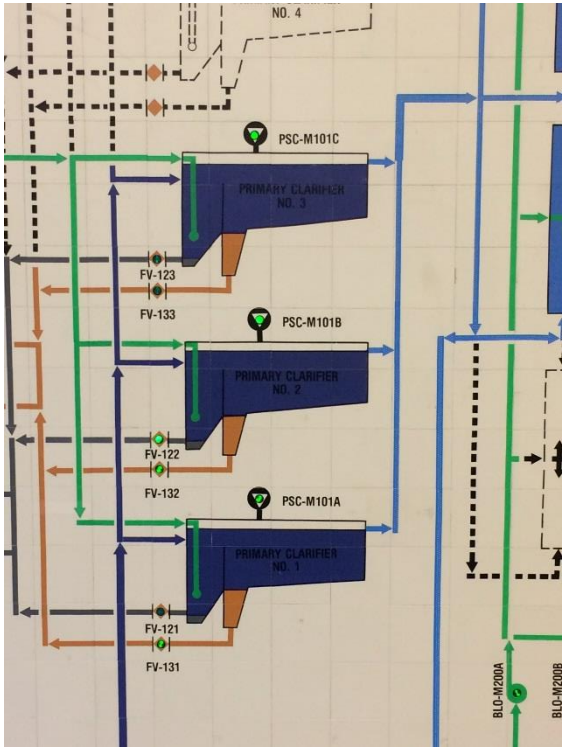


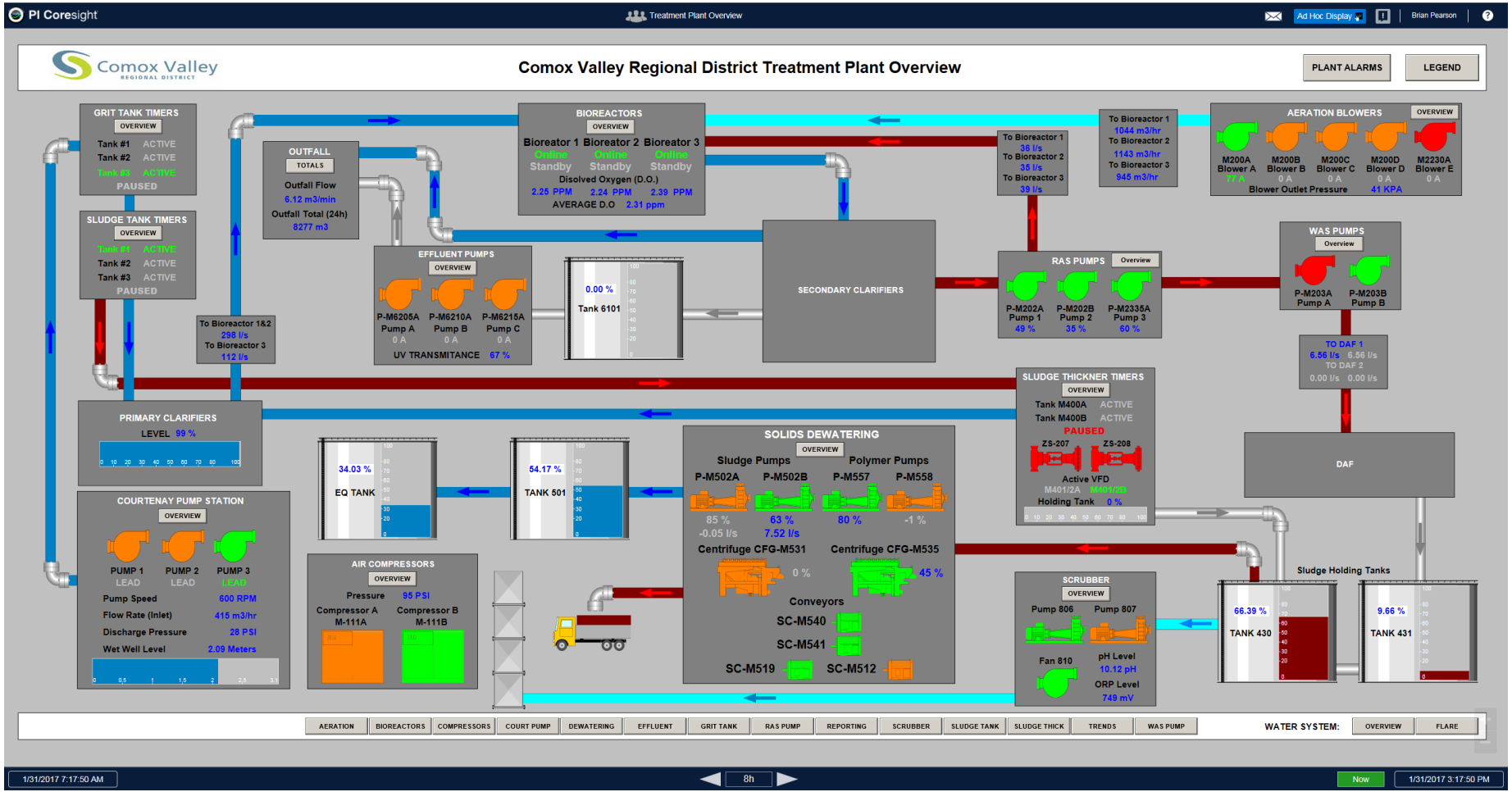


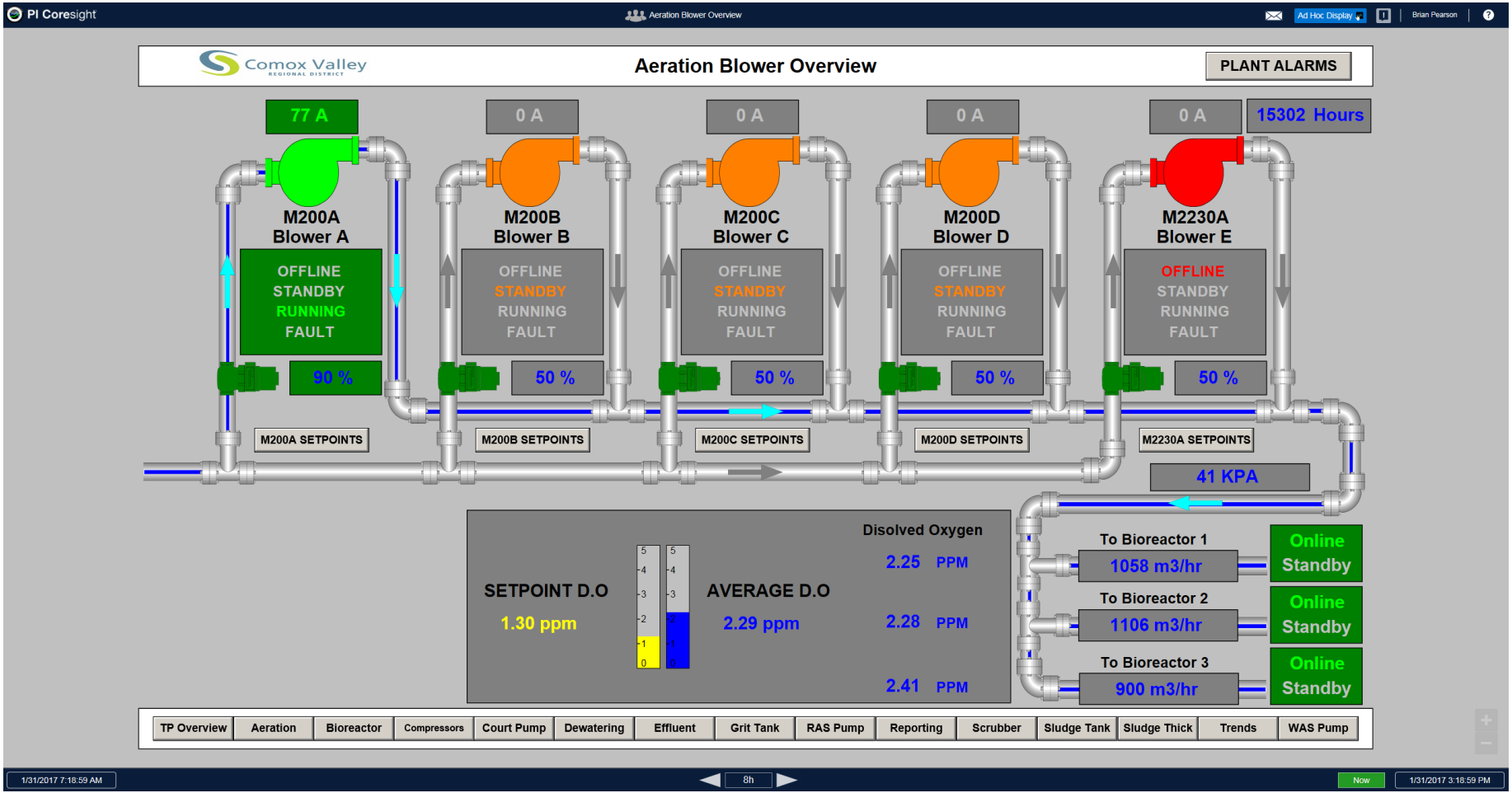


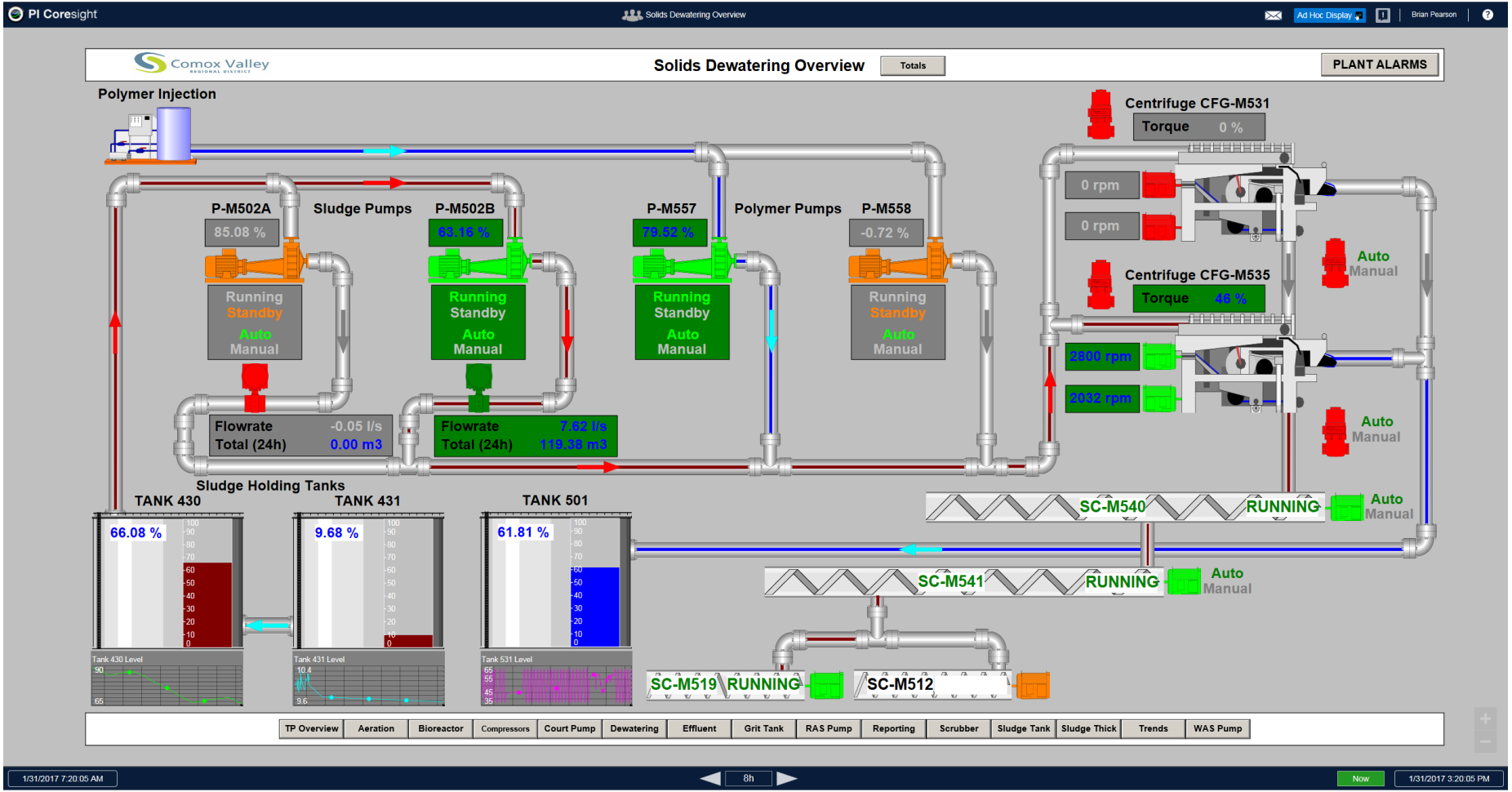
Water System Overview | Treatment Plant Overview

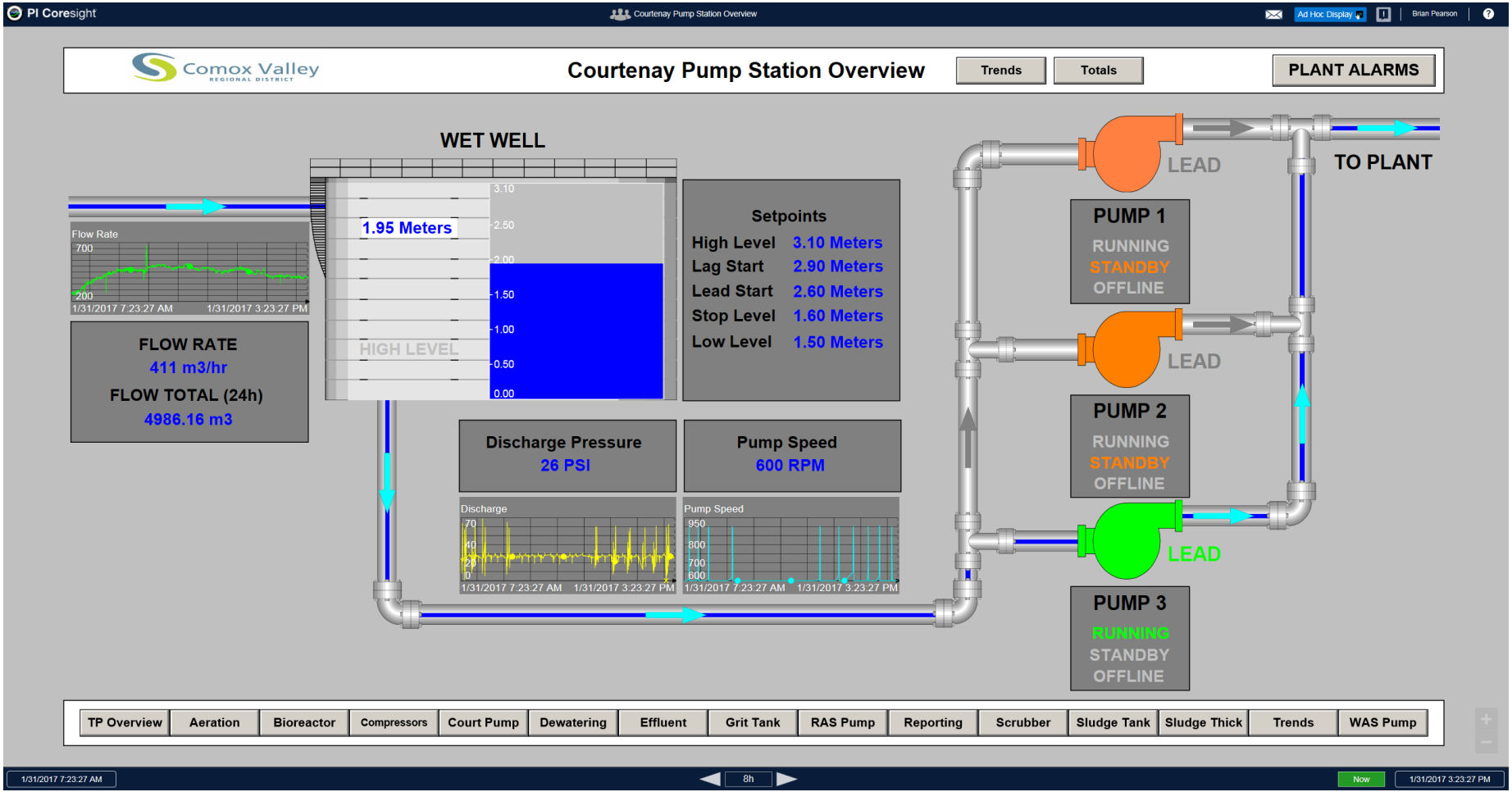












Meeting our Business needs

- **PI System®** allows us to bring all data from remote water, sewer and Solid waste stations to central office, and to all points on the WAN
- **PI System®** allows for collection through many methods as well as providing failover for the many different network connections between remote sites
- **PI System®** centrally stores and archives data from remote sites and allows for data analysis and monitoring in real time, anywhere
- **PI Coresight™** allows staff members in several different departments, at many remote sites to view, monitor and analyze collected data quickly and easily.

PI Server™ - Metrics

- **Data Archive** and **PI Interface™** have created a redundant, easily accessible data system
- **PI Server™** has centralized data collection for 27 remote sites
- Removed the need for sneaker net – staff going to remote sites to fetch data
- Extensive savings in record management, staff time, and time required to maintain historic data. (some sites were still using chart recorders)
  - 4 hours a week saved to collect scan and store chart records – Approx savings $8K/year

PI ProcessBook® - Metrics

- **PI ProcessBook®** has given the ability to create graphic rich HMIs for all PLC controlled sites.

- Has quickly become the standard viewing HMI for all sites, local site control is still RSView and Factory Talk

- **PI ProcessBook®** has allowed single point control of set points for reservoir filling, water control and pumping
  - Savings of 3 man hours per set point change – this can happened several times a week, or day. Savings : $8K /year

PI Coresight™ - Metrics

Water

- **PI Coresight™** has allowed the water department to monitor in real time the effects of changes to our water system that enable the CVRD to develop a more dynamic water delivery system
  - Reducing water pumping
  - Electricity use
  - Wear and tear on all aspects of water system
  - Real time monitoring allows for prioritization of site visits
  - Increased safety for operators – less late night traveling to sites
  - Savings in late night call outs per year: Approx $10K/year

PI Coresight™ - Metrics

Sewer

- **PI Coresight™** has allowed the sewer department to monitor in real time remote sites that are 25+ kilometers away
  - Reducing staff travel time and efficiencies during the day
  - Allows for prioritization of site visits for the day/week
  - Electricity use through real time monitoring and adjustments
  - Reductions in wear and tear on all aspects of the treatment plant systems and pumping systems

PI Coresight™ - Metrics

Engineering and management staff

- **PI Coresight™** allows staff to easily access data and generate needed analytics on data.
  - Saving many hours a week of SCADA tech time using PI Datalink®: Savings of approx. $5k – 8k/yr
  - Managers and Staff generate their own graphs, analytics or data downloads that they need through the course of a day.
  - All data is accessible, exportable and usable in many applications

Next Steps with data and PI system

Incorporating really remote Field Data

- Two rivers affecting water turbidity in Comox Lake, regional source of drinking water
- Need to collect turbidity data from remote data recorders
- No access to power, microwave connections or cellular data
- Satellite data connection through NOAA satellite
- Data to be incorporated into the PI System® using PI UFL Connector
- Compare turbidity from source to entry to water system

- **Brian Pearson**
- bpearson@comoxvalleyrd.ca
- Senior Manager of Information Systems & GIS
- Comox Valley Regional District

Questions

Please wait for the **microphone** before asking your questions

State your **name & company**

Please remember to…

Complete the Online Survey for this session

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