

Town of Georgina

Water and Wastewater SCADA



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SCADA INITIATIVE

- Reactive OR Proactive ?
- Static or Continuous improvement ?
- Does it meet todays and tomorrows needs?
- Does it support the Corporate Strategic Plan?

What is SCADA?

SCADA is an acronym for:

Supervisory – monitoring of plant process
(visualization/evaluation)

Control – controlling of plant process

And

Data **A**cquisition – collection of process data for
record purposes



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W & WS Overview

Town has the following Water and Wastewater Facilities with more on the horizon with future development

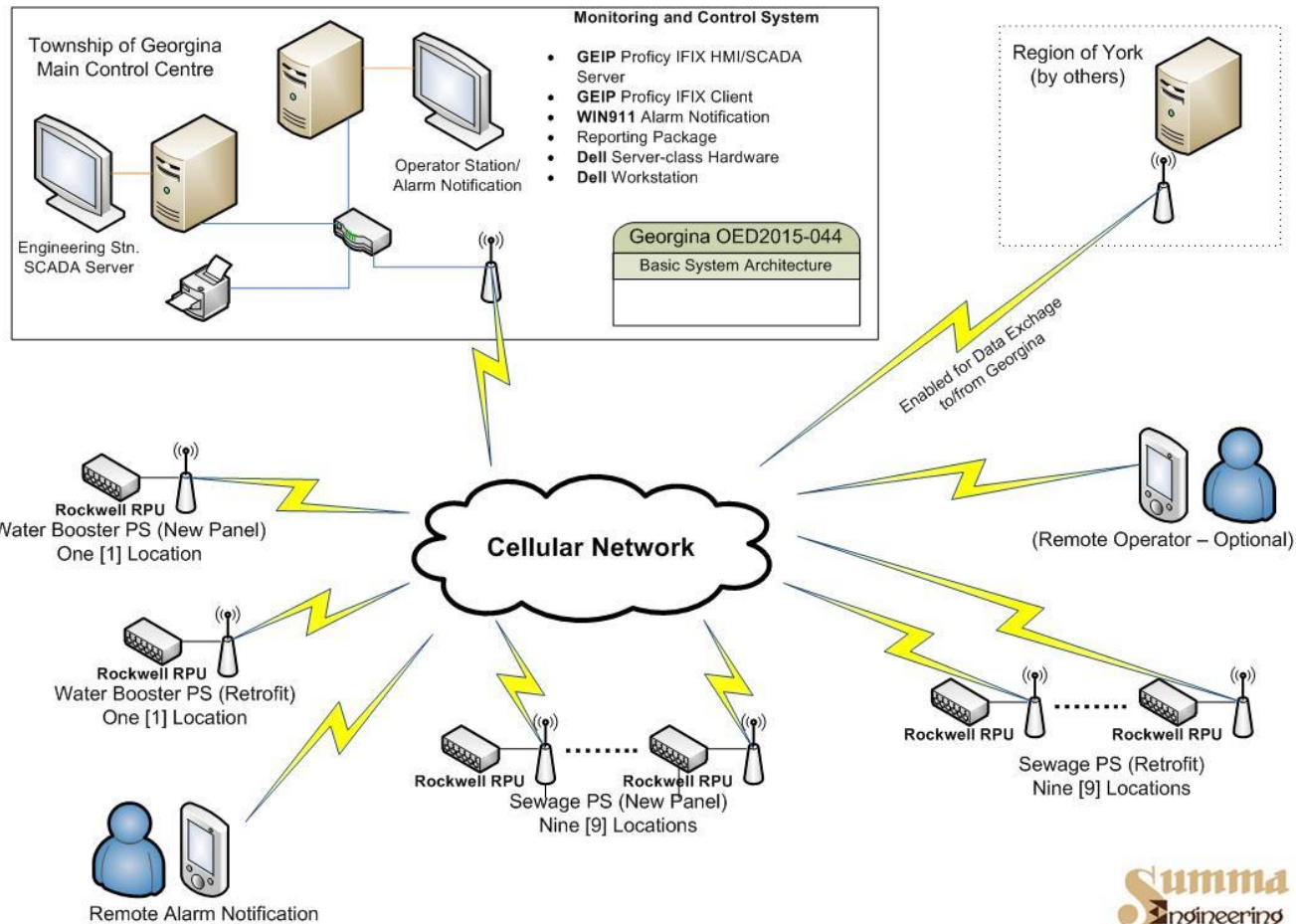
18 Sewage Pumping Stations

2 Water Booster Stations



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System Overview



Summa
Engineering
LIMITED



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Water and Wastewater SCADA

The Design/installation on the Water and Wastewater SCADA system for all the 20 facilities was started in October 2015 and was completed in a record time and was substantially completed in January 2017.

On time/on budget



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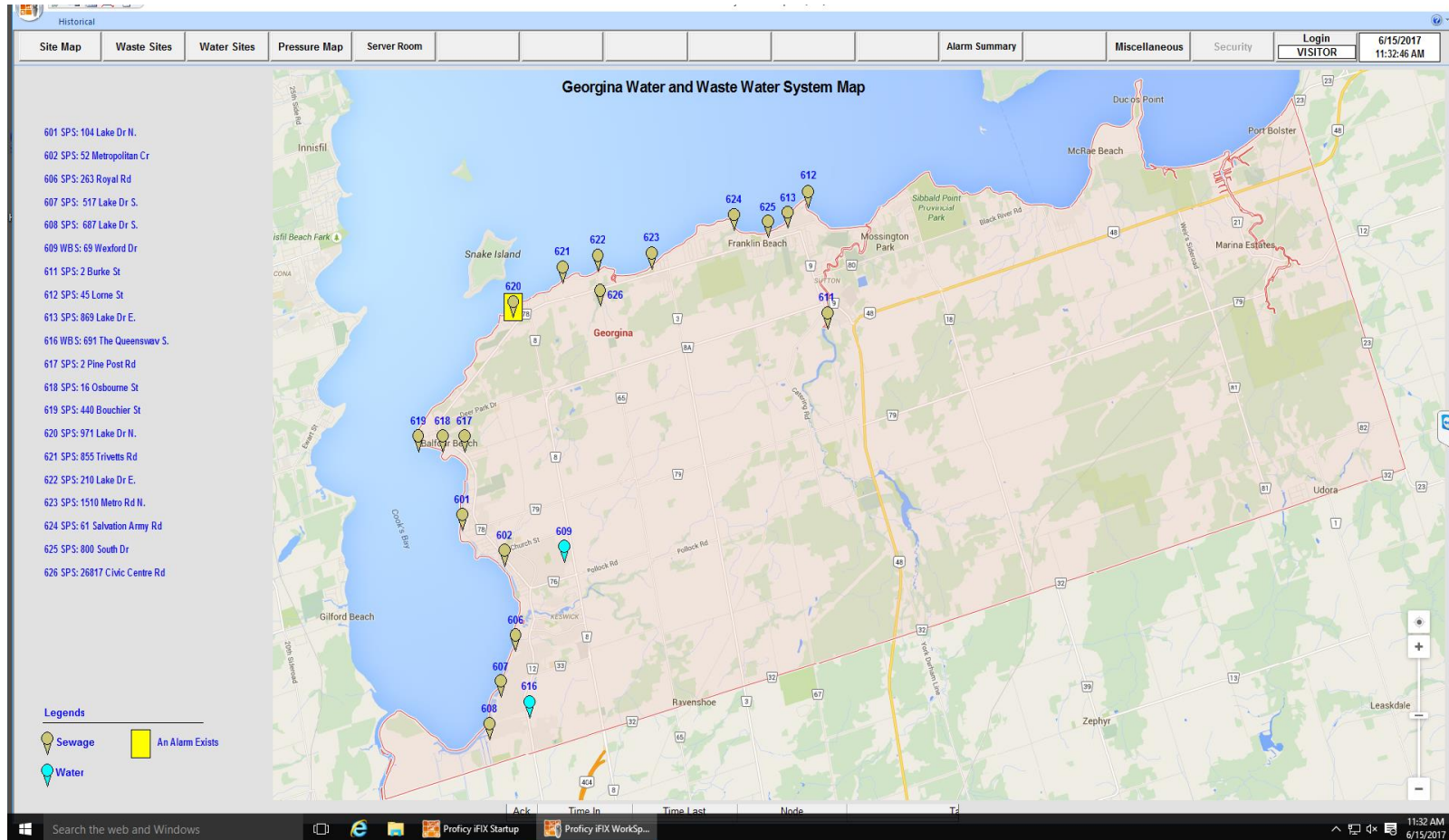
Water and Wastewater SCADA

This system now has given
Operations/Infrastructure the ability to
monitor and operate all remotes sites from
their laptop computers/ hand held devices.



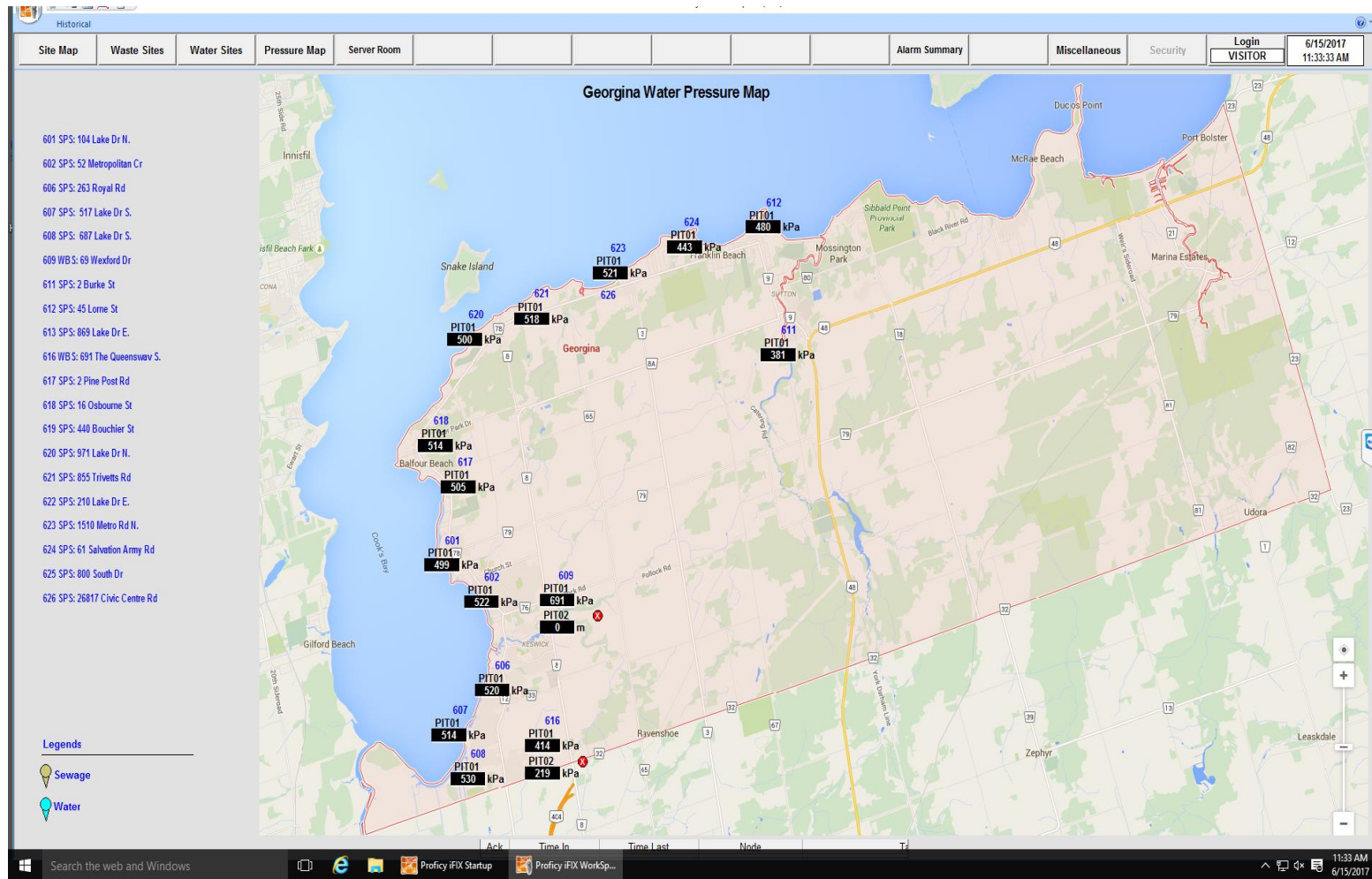
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SYSTEM MAP



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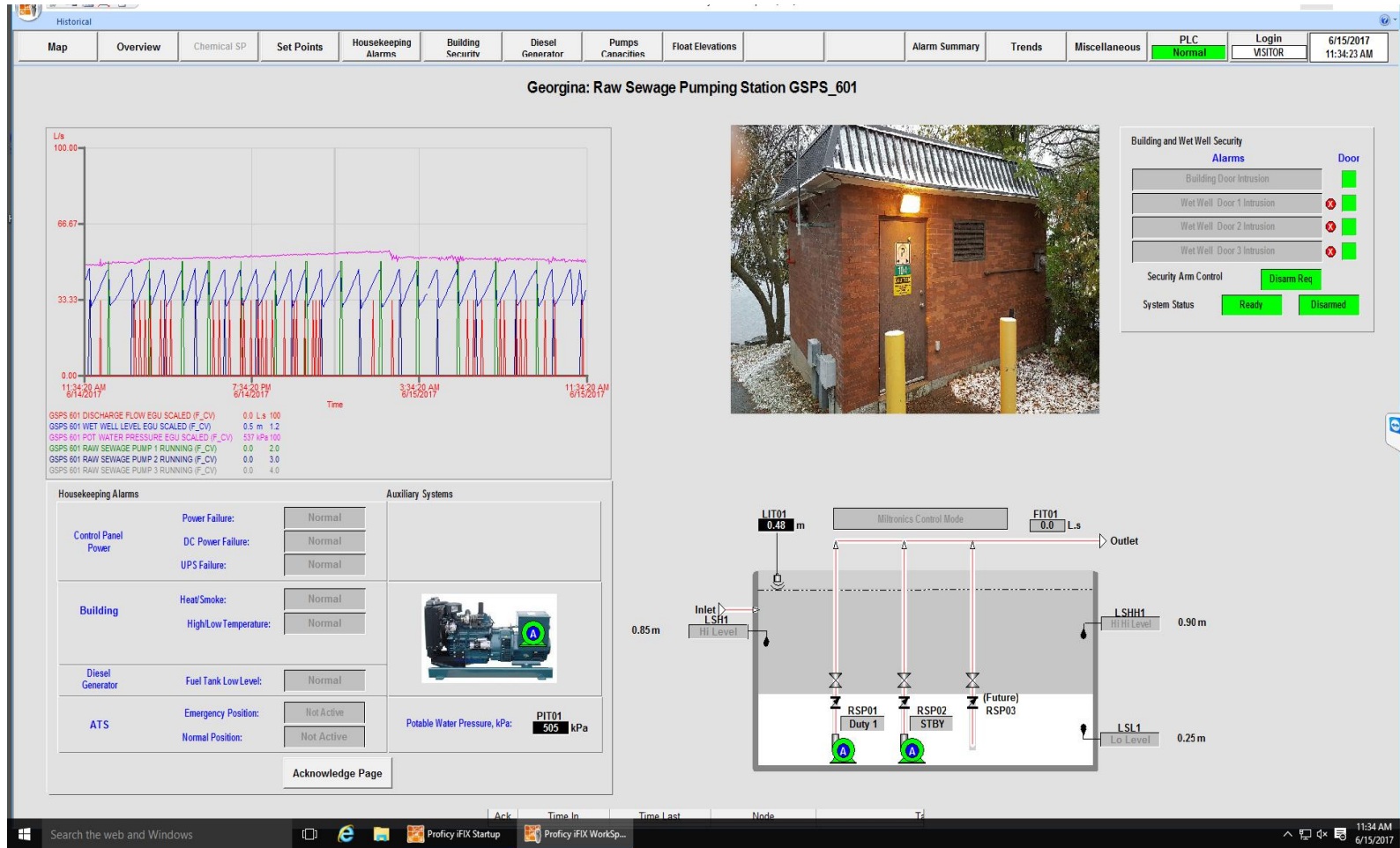
WATER PRESSURE MAP



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RAW SEWAGE PUMPING STATION 601

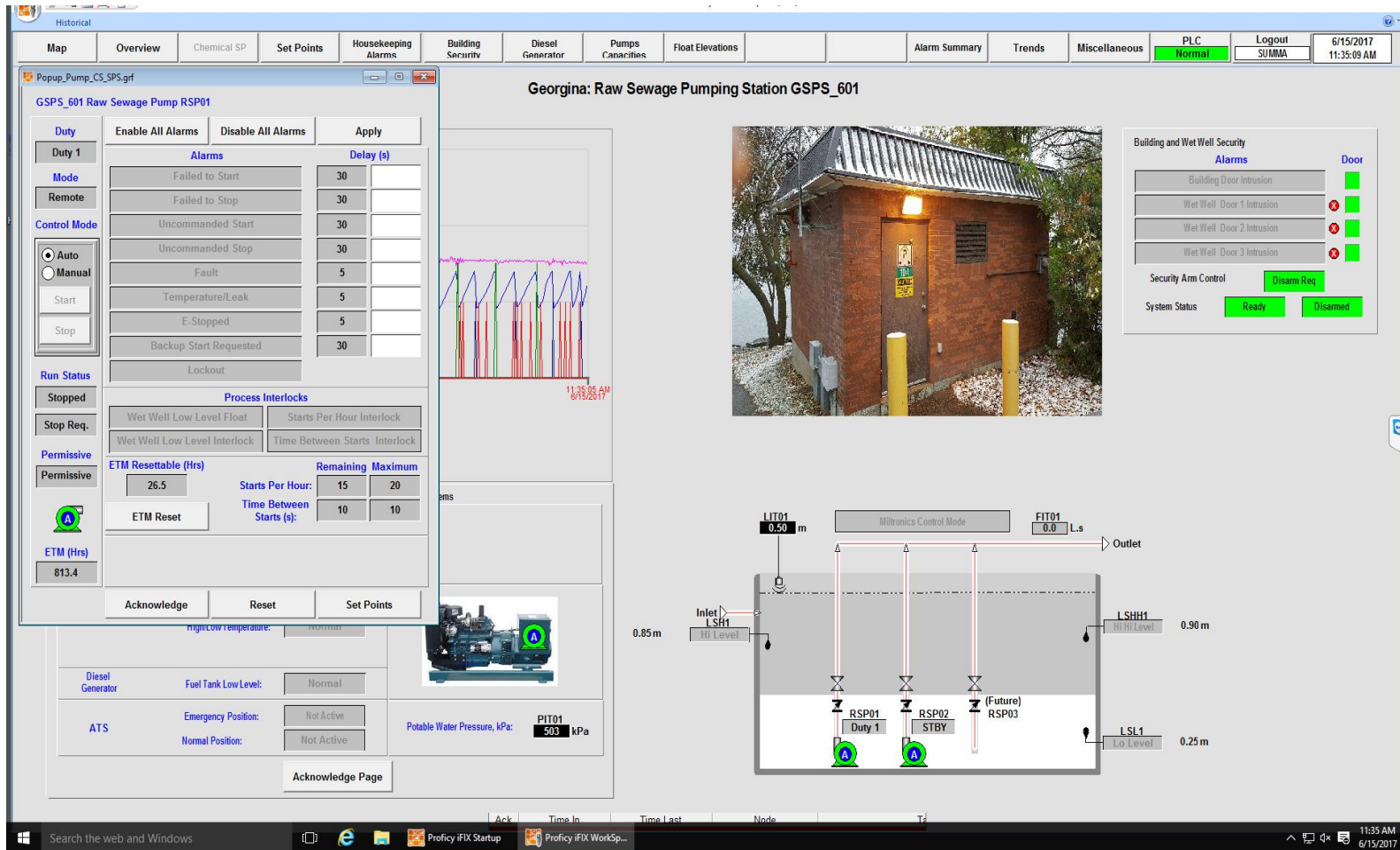
OVERVIEW SCREEN



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RAW SEWAGE PUMPING STATION 601

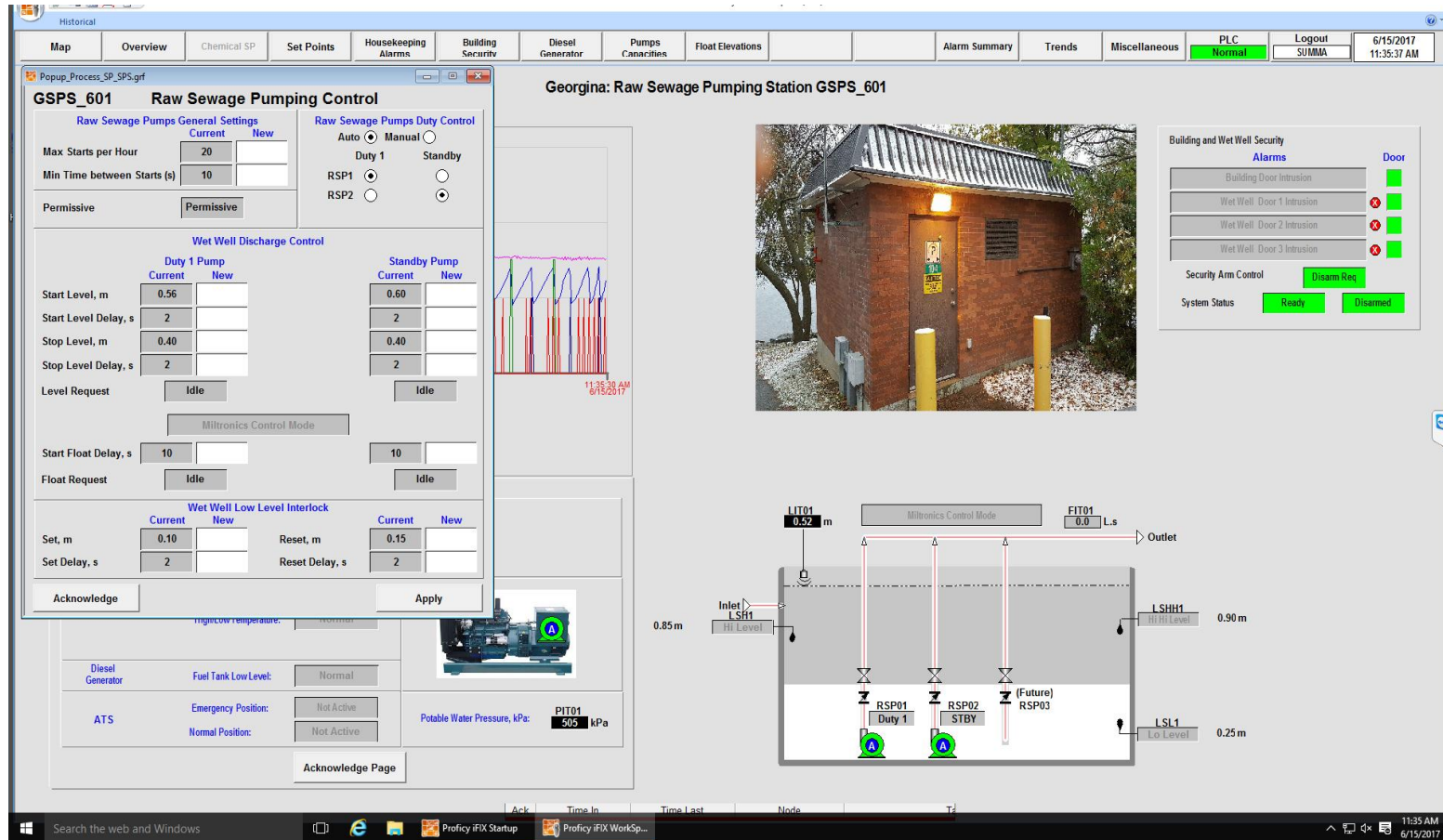
PUMP SCREEN



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RAW SEWAGE PUMPING STATION 601

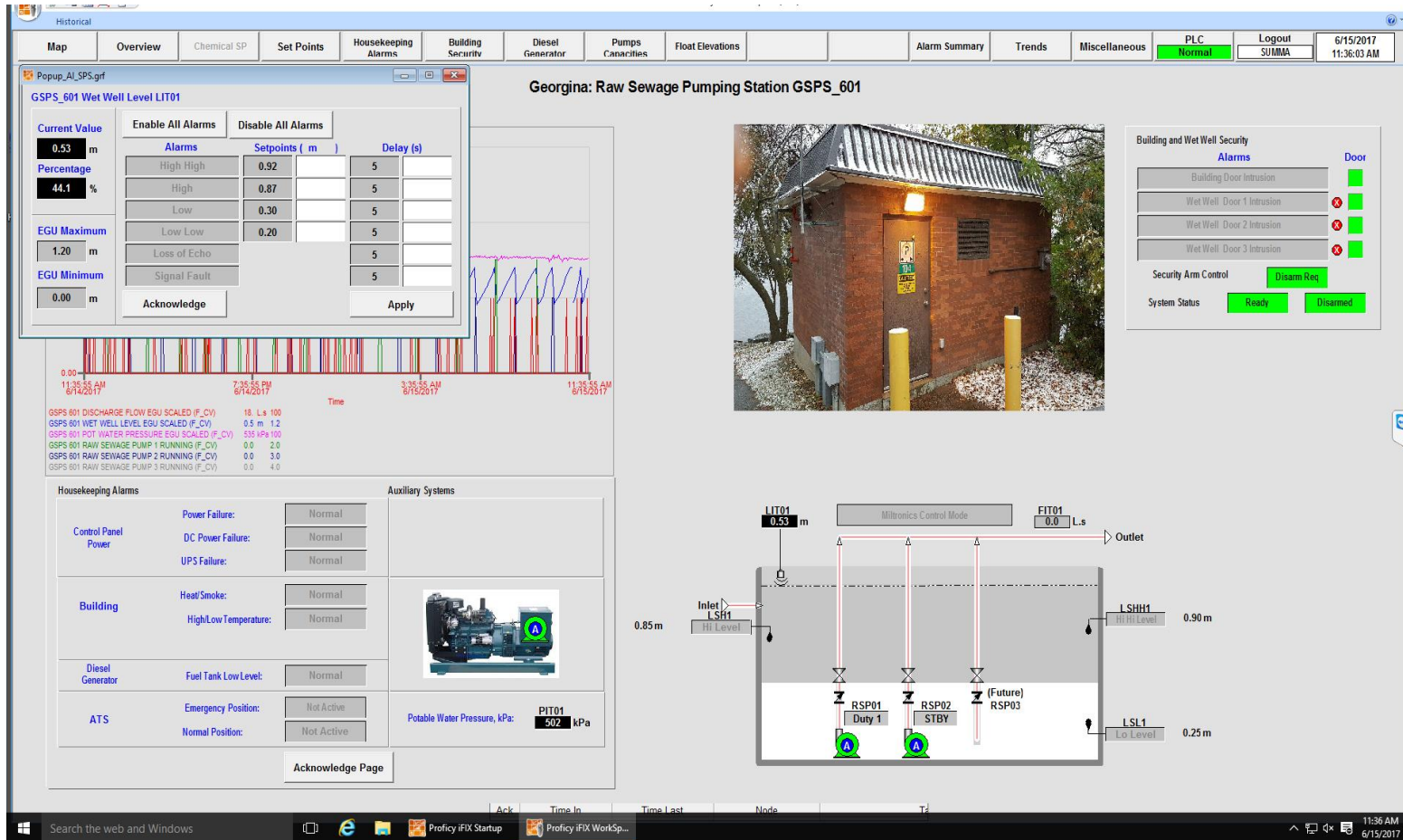
PUMPING CONTROL SCREEN



GEORGINA

RAW SEWAGE PUMPING STATION 601

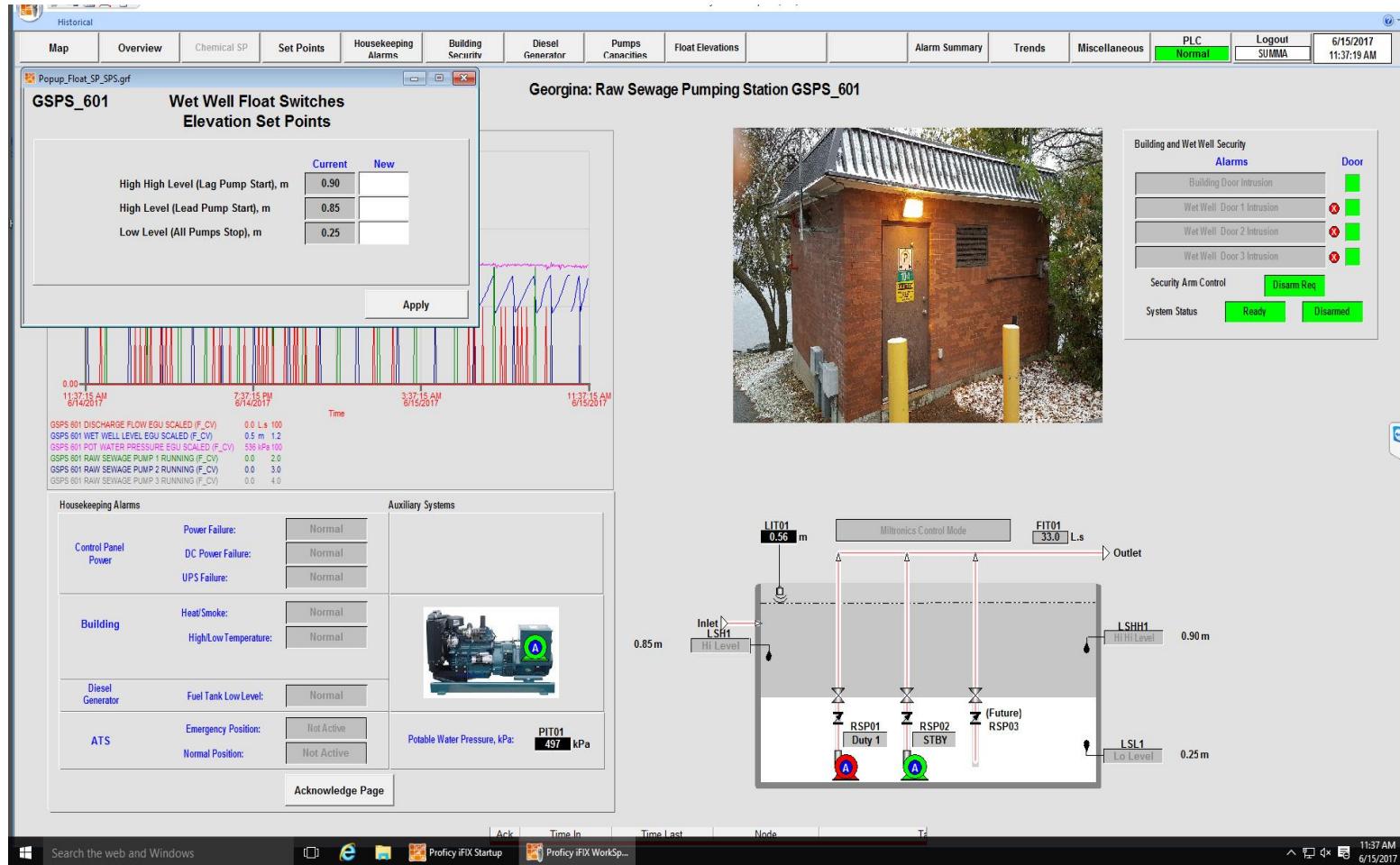
WET WELL SET POINT SCREEN



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RAW SEWAGE PUMPING STATION 601

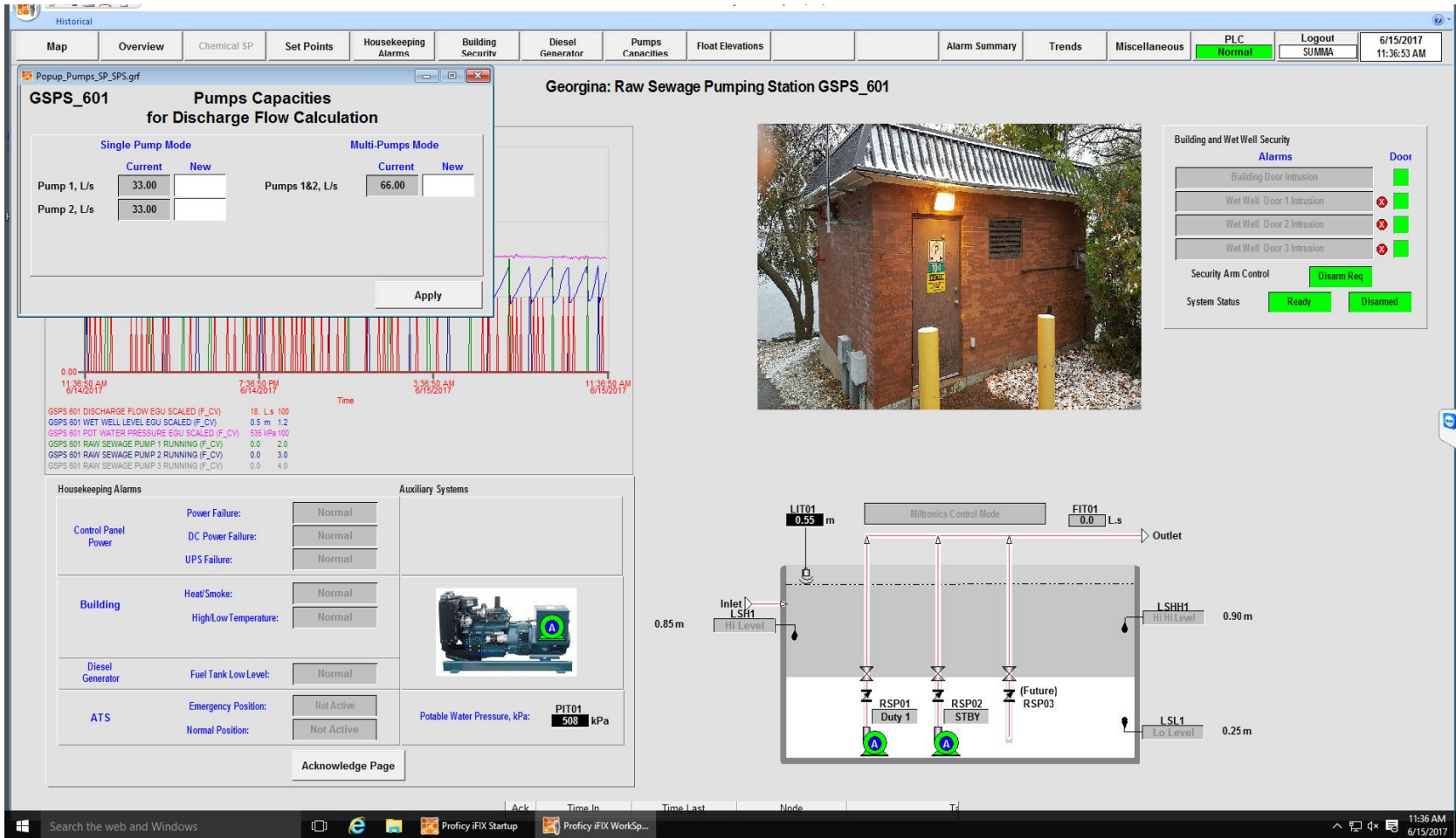
FLOAT ELEVATION SCREEN



GEORGINA

RAW SEWAGE PUMPING STATION 601

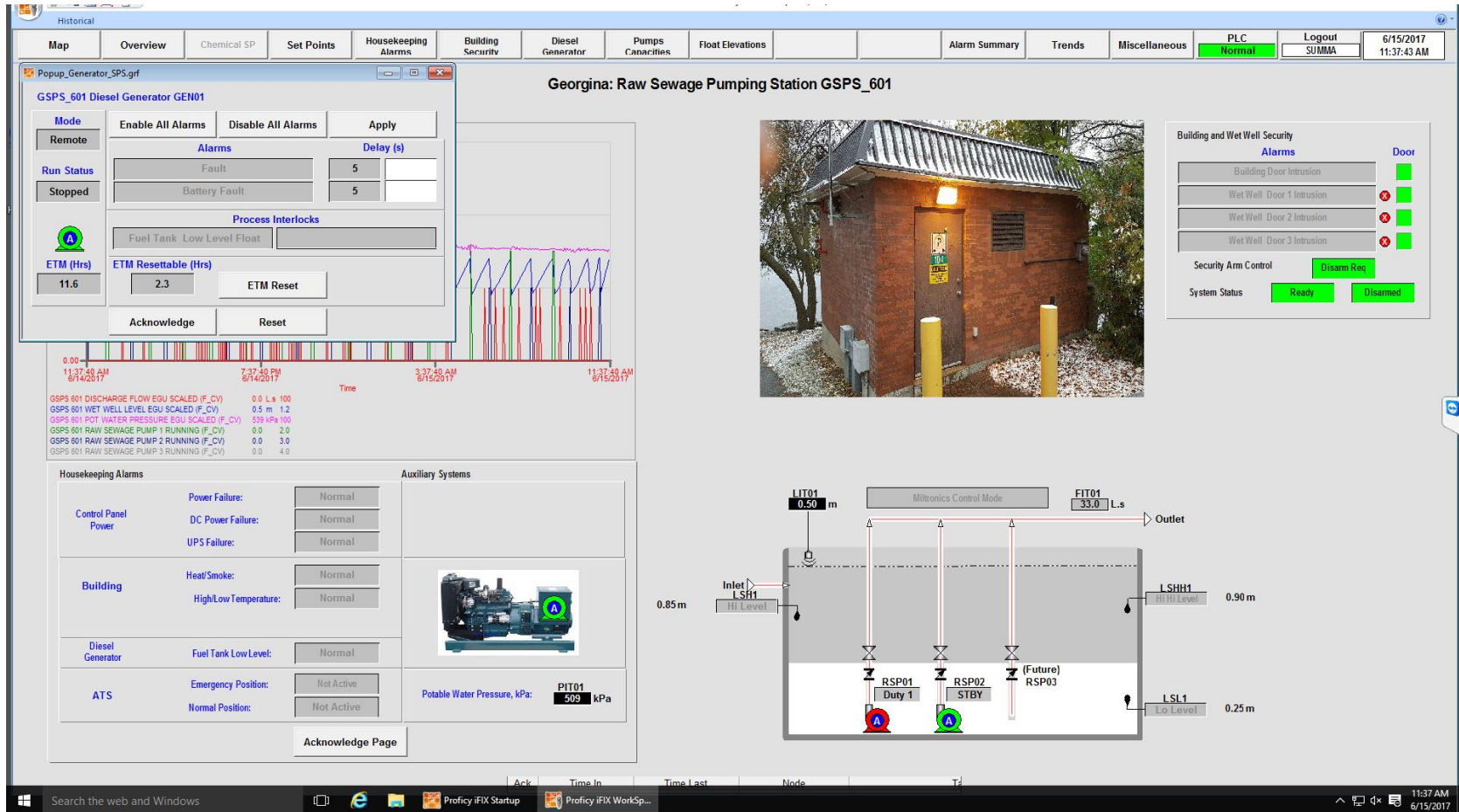
PUMP DISCHARGE FLOW SCREEN



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RAW SEWAGE PUMPING STATION 601

GENERATOR SCREEN



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RAW SEWAGE PUMPING STATION 601

BUILDING SECURITY SCREEN

Historical

Map Overview Chemical SP Set Points Housekeeping Alarms Building Security Diesel Generator Pumps Capacities Float Elevations Alarm Summary Trends Miscellaneous PLC Normal Logout SUMMA 6/15/2017 11:36:27 AM

PopUp_BLD_SCRT_SPS.grf

GSPS_601 Building Security

Alarms	Delay (s)	Enable	Door
Building/Control Panel Door Intrusion	5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wet Well Hatch Door 1 Intrusion	5	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Wet Well Hatch Door 2 Intrusion	5	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Wet Well Hatch Door 3 Intrusion	5	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Arming Time, s: 60
Disarming Time, s: 60

Security Control: Arm Disarm
Disarm Requested

System Status: Ready Not Armed

Acknowledge Apply

18 L/s 100
0.5 m 1.2
536 kPa 100
0.0 2.0
0.0 3.0
0.0 4.0

Housekeeping Alarms


Control Panel Power	Power Failure:	Normal
	DC Power Failure:	Normal
	UPS Failure:	Normal
Building	Heat/Smoke:	Normal
	High/Low Temperature:	Normal
Diesel Generator	Fuel Tank Low Level:	Normal
ATS	Emergency Position:	Not Active
	Normal Position:	Not Active

Auxiliary Systems

Potable Water Pressure, kPa: PIT01 506 kPa

Acknowledge Page

Georgina: Raw Sewage Pumping Station GSPS_601

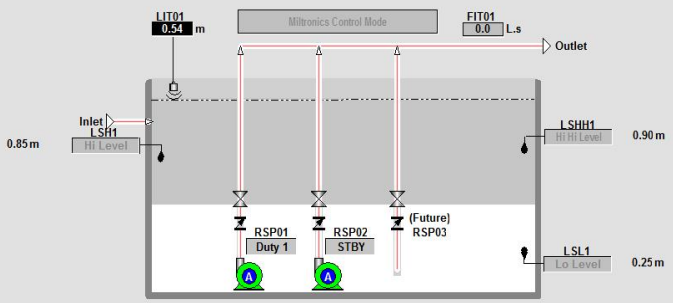


Building and Wet Well Security

Alarms	Door
Building Door Intrusion	<input checked="" type="checkbox"/>
Wet Well Door 1 Intrusion	<input checked="" type="checkbox"/>
Wet Well Door 2 Intrusion	<input checked="" type="checkbox"/>
Wet Well Door 3 Intrusion	<input checked="" type="checkbox"/>

Security Arm Control: Disarm Req.

System Status: Ready Disarmed

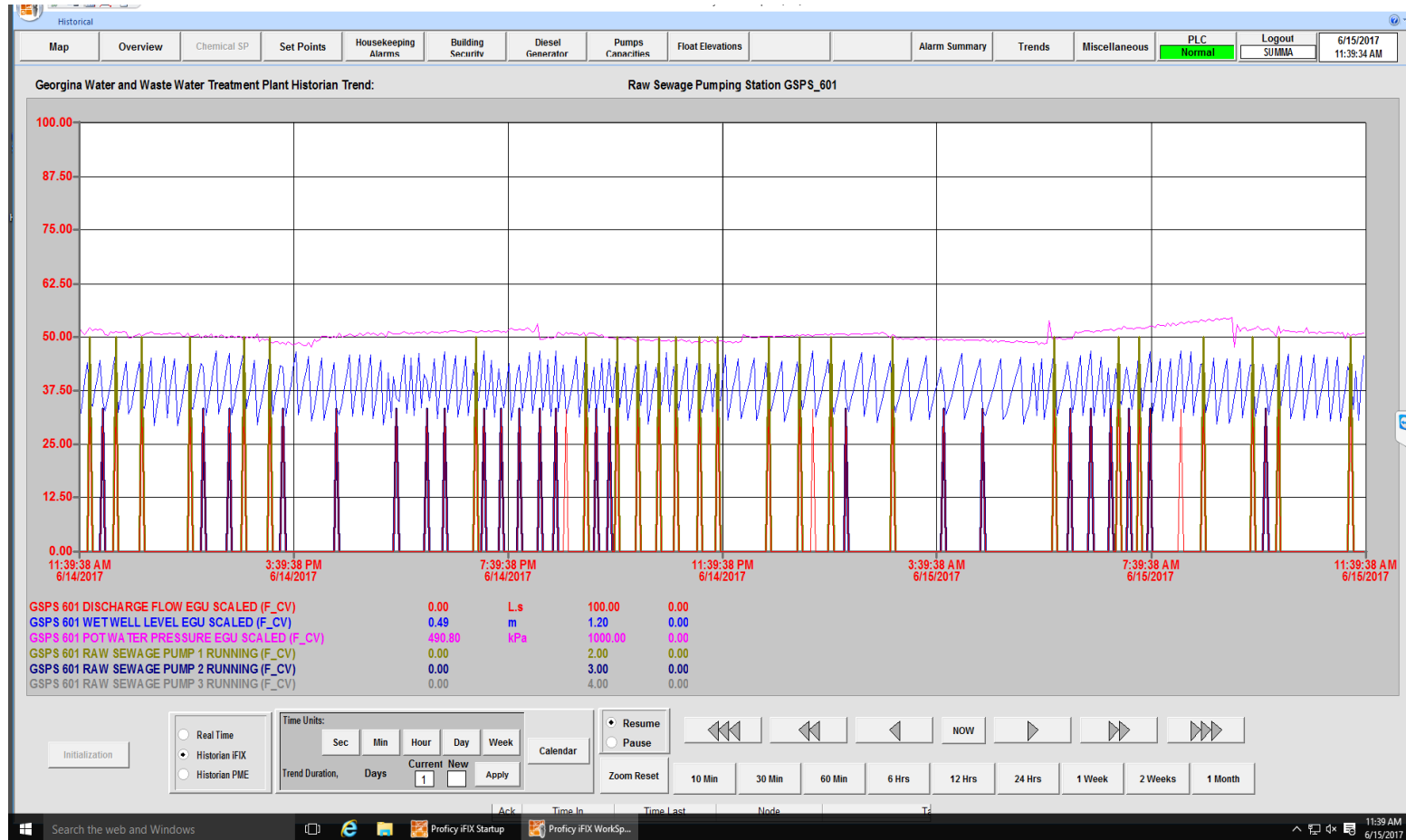


11:36 AM 6/15/2017



GEORGINA

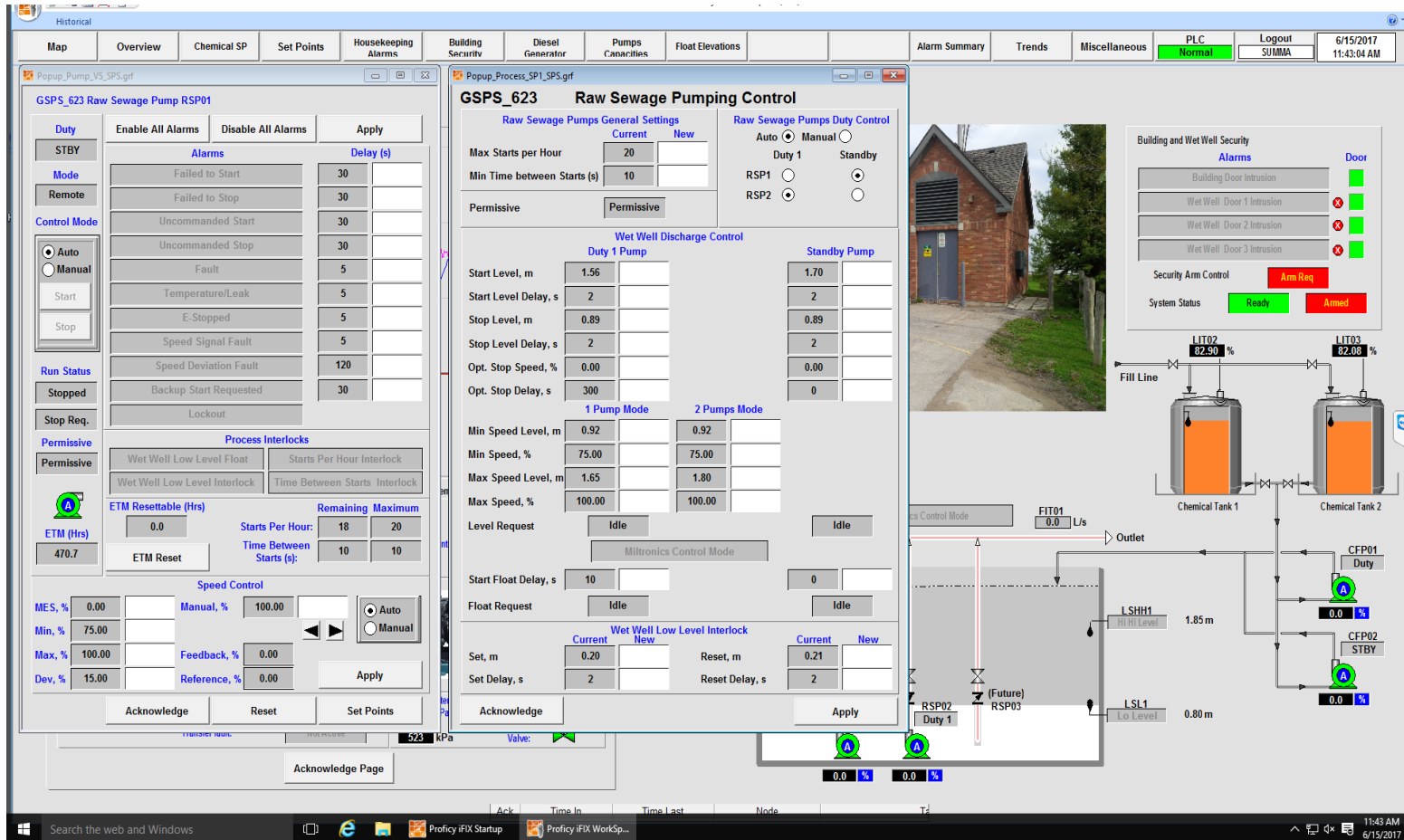
RAW SEWAGE PUMPING STATION 601 HISTORICAL TRENDING SCREEN



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RAW SEWAGE PUMPING STATION 623

VFD CONTROL SCREEN



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RAW SEWAGE PUMPING STATION 601

ALARM SUMMARY SCREEN

Historical

Map Overview Chemical SP Set Points Housekeeping Alarms Building Security Diesel Generator Pumps Capacities Float Elevations Alarm Summary Trends Miscellaneous PLC **Normal** Logout SUMMA 6/15/2017 11:39:59 AM

Running Start Win911 Win911 Test Not Active Set Reset GSPS_601 Alarm Summary

	Ack	Time In	Time Last	Date In	Tagname	Value	Description	Area
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
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20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								

Total Alarms: 0 Filter: Area Not "DISABLED" AND Area In "GSPS_601" Sort: Time In, Descending Run

Search the web and Windows Proficy iFIX Startup Proficy iFIX WorkSp...

11:40 AM 6/15/2017



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Historical

Map Overview Chemical SP Set Points Housekeeping Alarms Building Security Diesel Generator Pumps Capacities Float Elevations Alarm Summary Trends Miscellaneous PLC Normal Logout SUMMA 6/15/2017 11:43:29 AM

PopUp_Pump_CFP_SPS.grf

SPS_623 Chemical Feed Pump CFP01

Duty Enable All Alarms Disable All Alarms Apply

Duty Alarms Delay (s)

Mode Failed to Start 30

Remote Failed to Stop 30

Control Mode Uncommanded Start 30

Uncommanded Stop 30

Auto Fault 5

Manual Start 5

Stop 120

Backup Start Requested 30

Lockout

Run Status

Stopped

Stop Req.

Permissive

Permissive

Chem Tank Low Level Float Starts Per Hour Interlock

Chem Tank Low Level Interlock Time Between Starts Interlock

ETM (Hrs) 0.0

ETM Resettable (Hrs) 0.0

Remaining Maximum

Starts Per Hour: 20 20

Time Between Starts (s): 10 10

ETM Reset

Speed Control

MES, % 0.00

Manual, % 0.00

Auto

Min, % 0.00

Max, % 100.00

Feedback, % 0.00

Dev, % 15.00

Reference, % 0.00

Apply

Acknowledge Reset Set Points

520

Acknowledge Page

SPS_623 Chemical Feed and Trap Sealing Control

Chemical Feed Pumps Settings

Current New

Max Starts/hour 20

Min Restart Time, s 10

CFP1 Capacity, L/hr 90.00

CFP1 Stroke, % 100.00

CFP2 Capacity, L/hr 90.00

CFP2 Stroke, % 100.00

Chemical Solution Settings

Current New

Concentration, % 60.00

Specific Gravity, kg/L 1.23

Note: Chemical Feed Pumps Speed Control is currently not available

Chemical Pumps Duty Control

Auto Manual

Duty Standby

CFP1

CFP2

Start Request Idle

Requested Flow, L/hr 45.06

Estimated Daily Dosing Volume, L 0.00

Chemical Daily Dosing Control

Start Time	Dosing Flow, L/hr Current	Dosing Flow, L/hr New	Dosing Duration, s Current	Dosing Duration, s New	Dosing Interval, s Current	Dosing Interval, s New	Enable	Start Time	Dosing Flow, L/hr Current	Dosing Flow, L/hr New	Dosing Duration, s Current	Dosing Duration, s New	Dosing Interval, s Current	Dosing Interval, s New	Enable
00:00	45.06		60		1140			12:00	45.06		60		1140		
01:00	45.06		60		1140			13:00	45.06		60		1140		
02:00	45.06		60		1140			14:00	45.06		60		1140		
03:00	45.06		60		1140			15:00	45.06		60		1140		
04:00	45.06		60		1140			16:00	45.06		60		1140		
05:00	45.06		60		1140			17:00	45.06		60		1140		
06:00	45.06		60		1140			18:00	45.06		60		1140		
07:00	45.06		60		1140			19:00	45.06		60		1140		
08:00	45.06		60		1140			20:00	45.06		60		1140		
09:00	45.06		60		1140			21:00	45.06		60		1140		
10:00	45.06		60		1140			22:00	45.06		60		1140		
11:00	45.06		60		1140			23:00	45.06		60		1140		

Chemical Tanks Low Level Interlock

Current New

Set, % 5.00

Reset, % 10.00

Set Delay, s 2

Reset Delay, s 2

Permissive

Trap Sealing Valve Control

Current New Remaining

Interval, s 3600

Duration, s 5

1003

5

5

Apply

0.0 % 0.0 %

Door

Am Req

Armed

LIT03 62.08 %

Chemical Tank 2

CFP01 Duty

0.0 %

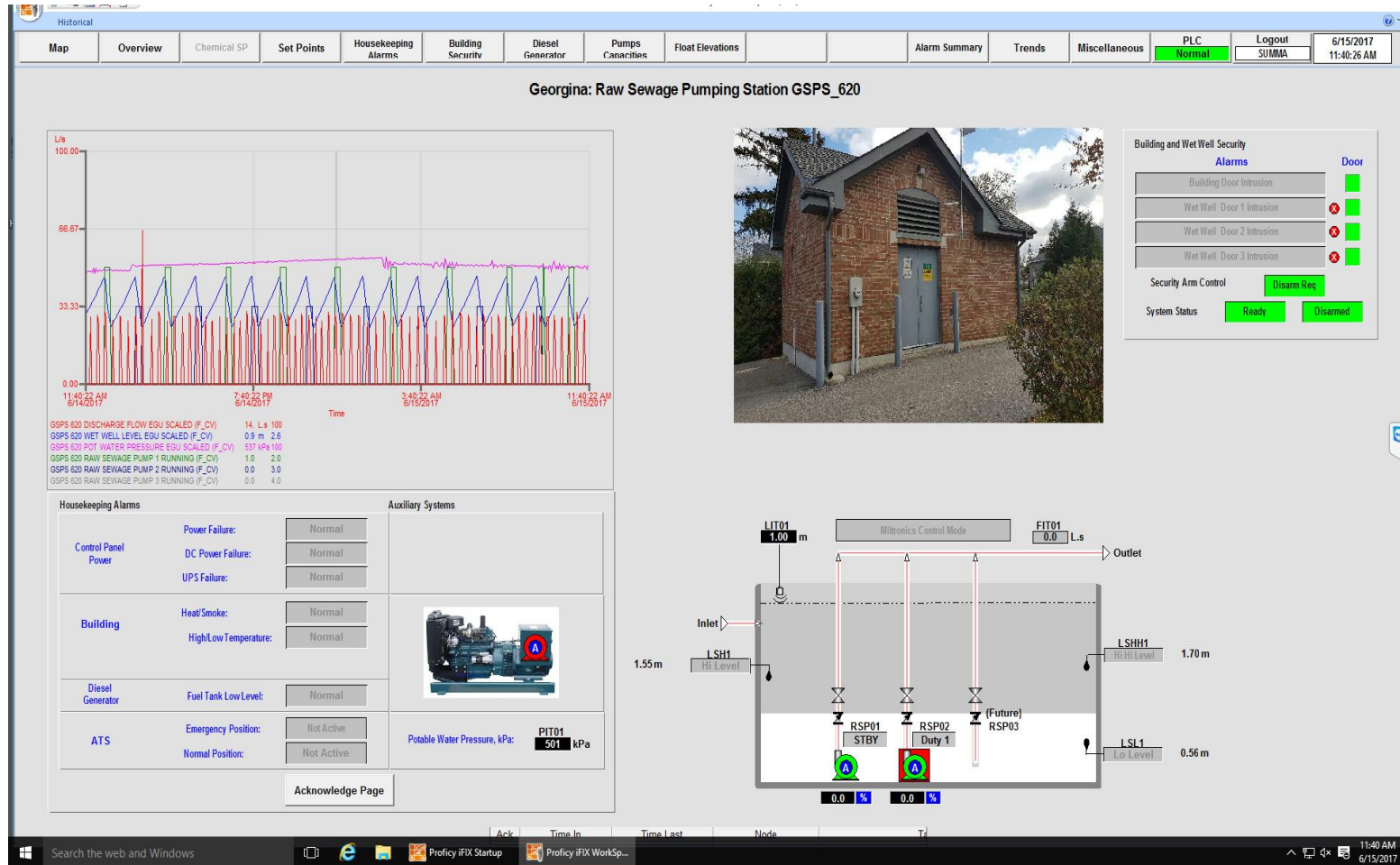
CFP02 STBY

0.0 %

11:43 AM 6/15/2017

RAW SEWAGE PUMPING STATION 620

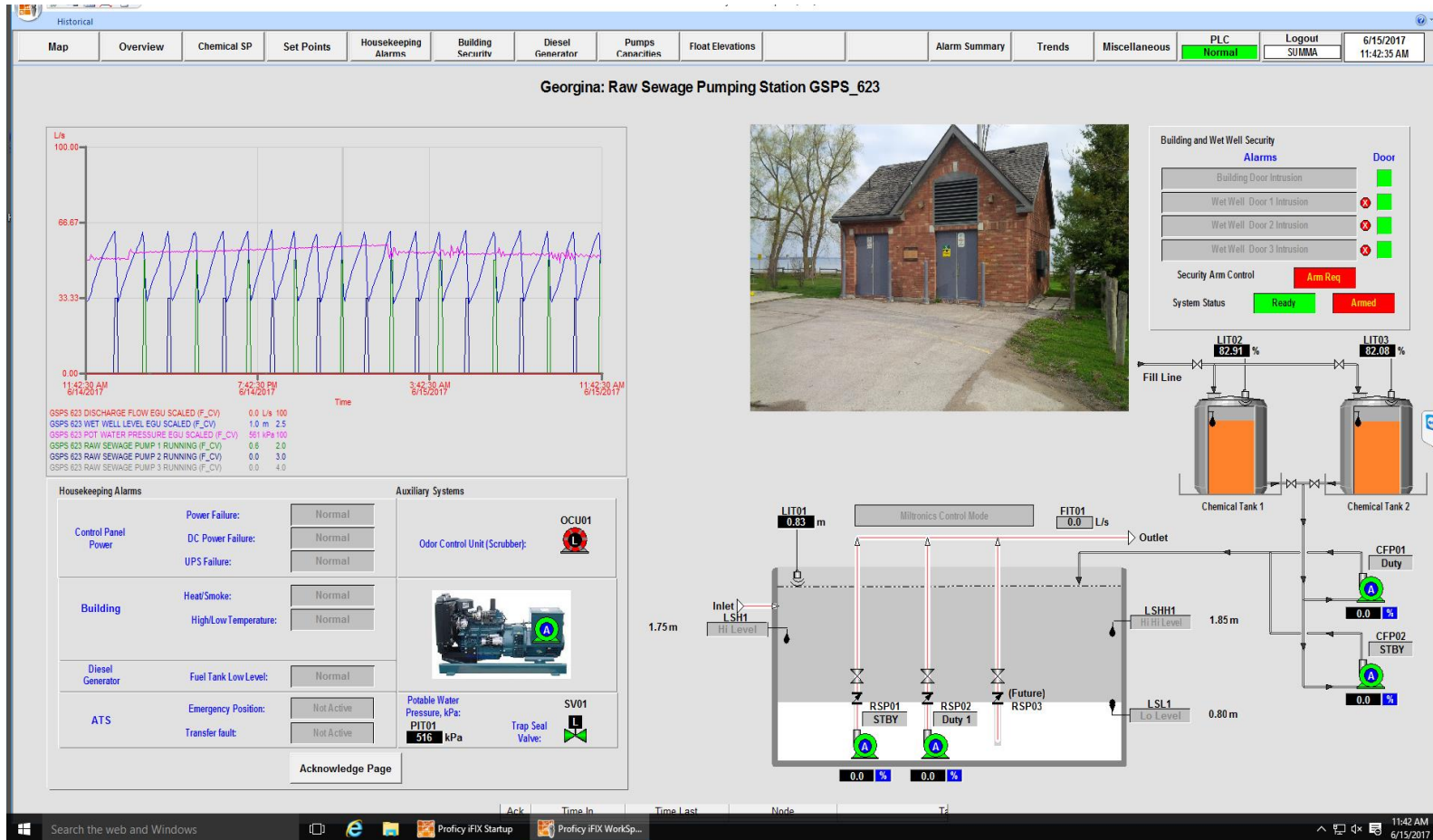
OVERVIEW SCREEN



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RAW SEWAGE PUMPING STATION 623

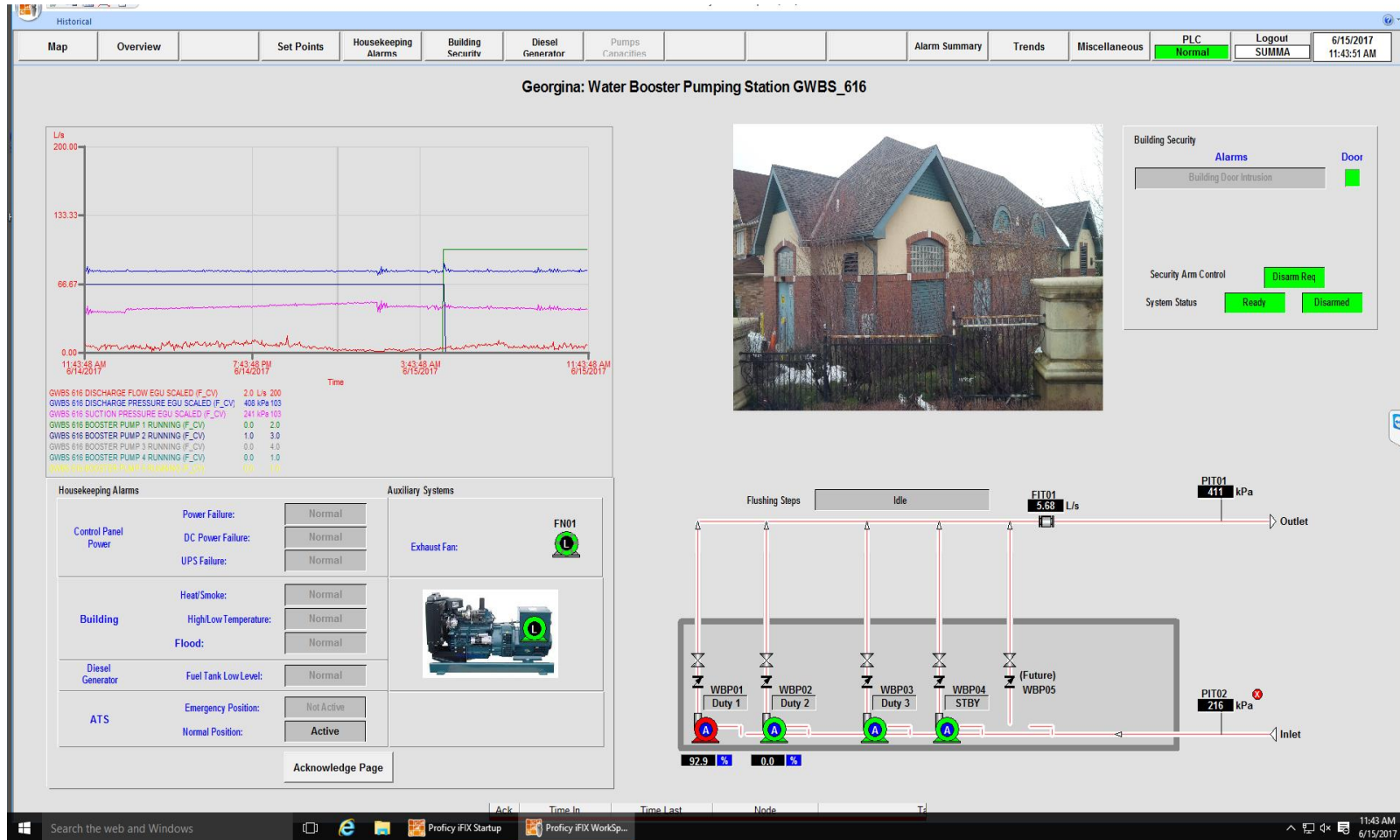
OVERVIEW SCREEN



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WATER BOOSTER PUMPING STATION 619

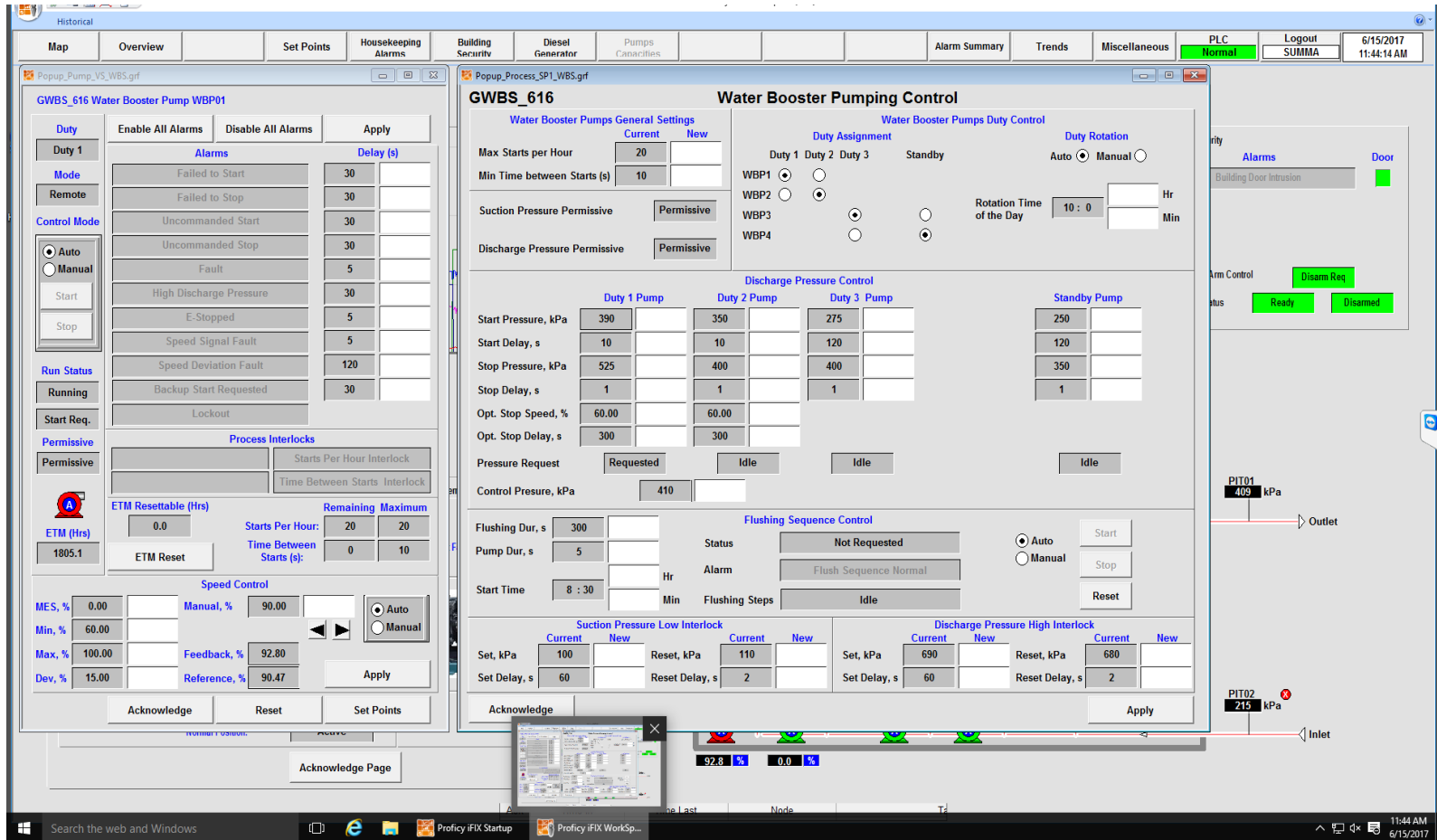
OVERVIEW SCREEN



GEORGINA

WATER BOOSTER PUMPING STATION 619

PUMPING CONTROL SCREEN



HISTORICAL REPORTS

The screenshot displays the 'City of Georgina Water and Waste Water System Map' interface. The map shows the coastline of Lake Simcoe with various monitoring stations marked by colored pins. A list of stations is provided on the left, including SPS (Sanitary Process) and WBS (Wastewater Bypass) locations. A dialog box titled 'Report on Demand Control' is open, allowing users to select a date (June 2017), a report type (Daily, Monthly, or Yearly), and a specific station (601 - 104 Lake Dr N. SPS). The 'Execute' button is visible at the bottom of the dialog. The interface includes a top navigation bar with tabs like 'Site Map', 'Waste Sites', 'Water Sites', 'Pressure Map', 'Server Room', 'Alarm Summary', 'Miscellaneous', 'Security', and 'Logout'. The bottom status bar shows the system time as 11:45 AM on 6/15/2017.

Georgina Water and Waste Water System Map

Report on Demand Control

View Report Regenerate Report

Select Date

June 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	1
2	3	4	5	6	7	8

Today: 6/15/2017

Select Type of Report

Daily Report
Monthly Report
Yearly Report

Select Station to Report

Water and Waste Water
601 - 104 Lake Dr N. SPS

☒ Check Report Availability

Selected Report

Daily20170614_601.xls

Execute

Legends

- Sewage
- Water
- An Alarm Exists



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20170614_612.xls [Compatibility Mode] - Microsoft Excel Viewer

Home

Open Quick Print Print Preview Office Document Copy Find Go To Page Setup Print Area Switch Windows Edit

	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q	R	S	T	U	V
	Date:	14 Jun. 2017	45 Lorne St SPS (612) Daily Report																		
	Time	Wet Well Level LIT01	Discharge Flow FIT01	Potable Water Pressure PIT01	Chemical Tank 01 Level LIT02	Chemical Tank 02 Level LIT03	Discharge Flow Total FIT01	Sewage Pump 01 RSP01	Sewage Pump 02 RSP02	Diesel Generator GEN01	Blower 01 BLR01	Chemical Feed Pump 01 CFP01	Chemical Feed Pump 02 CFP02	ODOR Control Unit OCU							
	m	l/s	kPa	%	%	m ³	hr	hr	hr	hr	hr	hr	hr	hr							
5	00:00 - 01:00	1.10	50.7	519	0.00	0.00	14.77	0:02:30	0:02:30	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
6	01:00 - 02:00	1.11	49.4	515	0.00	0.00	21.85	0:05:00	0:02:20	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
7	02:00 - 03:00	1.12	49.1	510	0.00	0.00	15.94	0:02:40	0:02:40	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
8	03:00 - 04:00	1.10	50.4	507	0.00	0.00	14.58	0:02:30	0:02:20	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
9	04:00 - 05:00	1.14	48.3	508	0.00	0.00	12.71	0:02:10	0:02:20	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
10	05:00 - 06:00	1.10	49.9	506	0.00	0.00	17.23	0:03:30	0:02:20	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
11	06:00 - 07:00	1.13	51.7	502	0.00	0.00	15.05	0:02:40	0:02:30	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
12	07:00 - 08:00	1.14	51.5	498	0.00	0.00	28.94	0:02:30	0:05:10	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
13	08:00 - 09:00	1.10	50.1	495	0.00	0.00	26.38	0:03:20	0:05:10	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
14	09:00 - 10:00	1.14	48.7	492	0.00	0.00	24.10	0:05:50	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
15	10:00 - 11:00	1.12	49.8	488	0.00	0.00	32.57	0:06:00	0:05:10	0:15:40	0:00:00	0:00:00	0:00:00	0:00:00							
16	11:00 - 12:00	1.13	49.5	496	0.00	0.00	24.76	0:02:40	0:05:40	1:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
17	12:00 - 13:00	1.12	50.7	484	0.00	0.00	31.03	0:05:30	0:05:10	1:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
18	13:00 - 14:00	1.11	47.6	480	0.00	0.00	22.80	0:05:00	0:02:40	1:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
19	14:00 - 15:00	1.11	51.3	478	0.00	0.00	22.41	0:02:40	0:04:50	1:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
20	15:00 - 16:00	1.12	49.1	502	0.00	0.00	23.35	0:05:20	0:02:40	0:18:00	0:00:00	0:00:00	0:00:00	0:00:00							
21	16:00 - 17:00	1.14	49.4	513	0.00	0.00	24.73	0:03:50	0:04:50	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00							
22	17:00 - 18:00	1.12	51.5	5																	

WBS 616 DAILY PERFORMANCE REPORT

20170614_616.xls [Compatibility Mode] - Microsoft Excel Viewer

Date: 14 Jun. 2017 691 The Queensway S. WBS (616) Daily Report										
Time	Suction Pressure PIT02 kPa	Discharge Pressure PIT01 kPa	Discharge Flow FIT01 l/s	Discharge Flow FIT01 m3	Pump 01 WBP01 hr	Pump 02 WBP02 hr	Pump 03 WBP03 hr	Pump 04 WBP04 hr	Pump 05 WBP05 hr	Diesel Generator GEN01 hr
00:00 - 01:00	228	410	2.6	9.10	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00	0.00:00
01:00 - 02:00	224	410	1.7	5.97	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00	0.00:00
02:00 - 03:00	222	410	1.5	5.55	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00	0.00:00
03:00 - 04:00	219	410	1.7	6.02	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00	0.00:00
04:00 - 05:00	216	410	2.4	8.77	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00	0.00:00
05:00 - 06:00	210	410	4.6	16.55	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00	0.00:00
06:00 - 07:00	203	410	6.7	24.23	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00	0.00:00
07:00 - 08:00	202	410	7.7	27.81	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00	0.00:00
08:00 - 09:00	223	410	5.4	19.33	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00	0.00:00
09:00 - 10:00	237	410	4.4	16.56	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00	0.00:00
10:00 - 11:00	240	410	5.9	20.81	0.01:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
11:00 - 12:00	226	410	5.0	18.11	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
12:00 - 13:00	220	410	5.1	18.64	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
13:00 - 14:00	215	410	4.8	17.42	0.00:00	0.58:30	0.00:00	0.00:00	0.00:00	0.00:00
14:00 - 15:00	210	410	4.9	17.10	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
15:00 - 16:00	198	410	6.5	23.41	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
16:00 - 17:00	207	410	7.0	24.97	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
17:00 - 18:00	213	410	8.0	28.87	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
18:00 - 19:00	218	410	7.9	28.27	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
19:00 - 20:00	221	410	9.4	33.87	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
20:00 - 21:00	214	410	7.8	28.46	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
21:00 - 22:00	209	410	7.4	26.72	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
22:00 - 23:00	204	410	5.1	18.44	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
23:00 - 00:00	200	410	3.3	11.77	0.00:00	1.00:00	0.00:00	0.00:00	0.00:00	0.00:00
Daily Aver	216	410	5.3							
Daily Min	144	331	0.5							
Daily Max	268	444	24.5							
Daily Min Time	21:00 - 22:00	10:00 - 11:00	01:00 - 02:00							
Daily Max Time	10:00 - 11:00	00:00 - 01:00	10:00 - 11:00							
Daily Total				456.75	10:01:00	13:58:30	0:00:00	0:00:00	0:00:00	0:00:00

Ready

Search the web and Windows

Proficy iFIX Startup Proficy iFIX WorkSp... Microsoft Excel Vie...

11:48 AM 6/15/2017



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BENEFITS

- Centralized Control
- Expandable (new installations recoverable)
- Core service transitioning to proactive
- Deeper understanding of the Operation as result of better real time info
- The potential to become predictable operations
- Reduces having to visit sites during and after normal business hours
- Remotely access the site and assess the urgency of the alarm event. This will help reduce costs related to after hours call out and eliminates multiple visits to the site to troubleshoot issues that can be put off to normal working hours.



GEORGINA

BENEFITS

- Recent event was the fire at the Rental Business in the south end of Keswick. During the fire, the Fire Department was concerned about pressures in what is called a Water Boosted Zone that the Water Booster Station on Joe Dales Dr and The Queensway South supplies water to. Town Water and Wastewater Staff were able to remotely monitor the performance of the Water Booster Station and relay pertinent information to the Fire Department verifying water pressures and high flow pump operations were normal throughout the event.
- One recent event during the heavy rain and potential flooding during early May was the Town's Water and Wastewater Staff were able to remotely monitor the sites after hours and provided information to York Region Wastewater staff that assisted them with high flows into their facilities. The information provided to the Region likely prevented the bypassing of raw sewage directly to Lake Simcoe.



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BENEFITS

- Trending

Trending has given staff an ability to see abnormalities in flows and station processes to facilities which can assist in several ways such as:

- Spikes in flows during rain events from inflow (rain water that enters the system from various sources such as sump pumps) can be seen
- May point to illegal activities such as illegal dumping into the sewer system from liquid haulage tankers
- Provided an ability to view pumping cycles that can identify equipment issues such as a drop in pumping efficiency that can indicate pumps are clogging up allowing staff to plan maintenance activities more efficiently



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BENEFITS

- Data Collection and Reporting

- Provides for historical site operating data that can be viewed at any time in the future.

- Alarm Monitoring

- The automated alarm notification system alerts operators of events that fall outside of specific criteria for each site. This system also incorporates an escalation protocol in the event of the alarm not being acknowledged by the on call operator.
- Alarms and events remain active and can be viewed through remote computer access until a operator acknowledges the alarm or event. Once acknowledged the information is stored in the historical data for later retrieval if required.



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BENEFITS

- Water Pressure Monitoring
 - Data stored in historical logs can assist with customer complaints regarding water pressures. Future York Region data sharing will also compliment this regarding water quality (chlorine residuals potentially)
 - Live pressure data assists with emergency events such as broken watermains and impacts these can have on overall system pressures and fire flows that could be impacted as a result



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BENEFITS

- **System Flexibility**

- The systems flexibility allows for future additions of new facilities, increased monitoring points at existing sites and customized site specific applications.

- **Data Sharing**

- Data sharing between Georgina and York Region will assist both levels of operations staff in monitoring and troubleshooting plants and facility operations.



GEORGINA

FUTURE PROJECTS

In the current year a facility security monitoring system through SCADA is being implemented which will allow for controlled access to Town water and wastewater facilities with real time logging of visitors to site in historical database and alarm unauthorised access.



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Annual Maintenance Required

Annual maintenance agreements

Similar concept to out sourcing “pump maintenance” for vibration checks, bearing replacement, oil & grease, etc.

System Integrators like Summa can provide a program for preventative maintenance to mitigate premature equipment failures

Defined list of tasks, on a prescribed schedule

- PLC panel cleaning and checking wires are tight
- UPS battery checks
- SCADA server physical cleaning for dust, etc.
- SCADA server hard drive space check and fault checks
- SCADA server and PLC program backups maintained off site



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Questions and Answers

