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Seeq conneqt

Monitoring Flows for Wastewater Management

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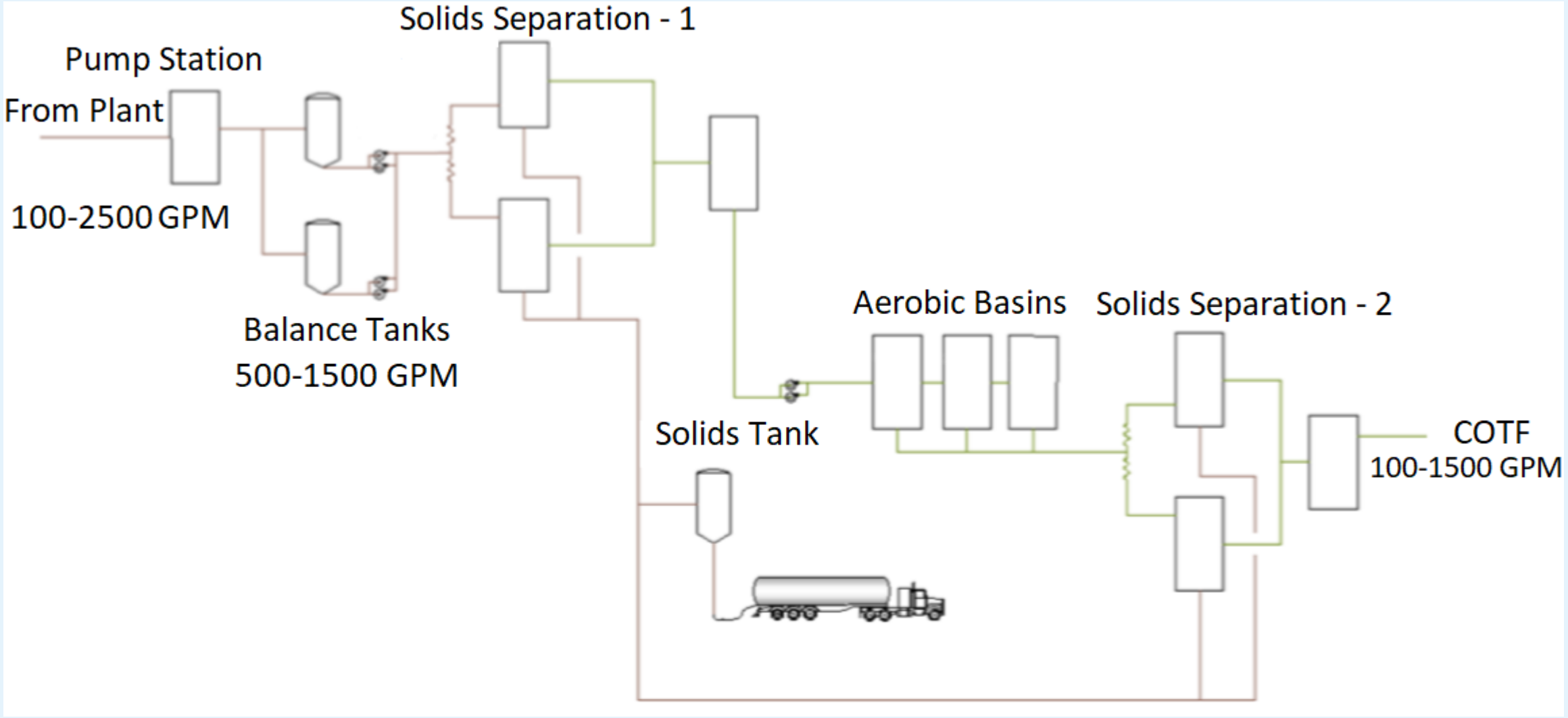
Chobani®

Fast Facts

- Founded 2005
- 3000+ Employees
- Largest Facility in Twin Falls, ID
- Greek Yogurt, Oat Milk, Dairy-based Coffee Creamers, RTD Coffee Beverages

Chobani Waste Treatment

Chobani Waste Treatment PFD



Proactive Waste Management

CHALLENGE

- Chobani sends 1.1-2.2 million USG/day to Chobani Waste Treatment.
- City of Twin Falls permit limit is 2 million USG/day.

SOLUTION

1) Use Seeq to predict real-time usable volume in balance tanks and send a notification to moderate flows when tanks are close to capacity.
2) Use Seeq to predict totalized discharge volume by end of the day. Create notifications if current run rates are set to exceed the permit limits.

RESULTS

- Proactive reduction of discharge rates reduced annual permit exceedances by 95%
- Conformed to Chobani ESG goals and prevented costly surcharges and fines.

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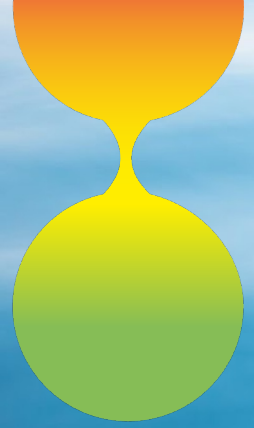
SOLUTION 1



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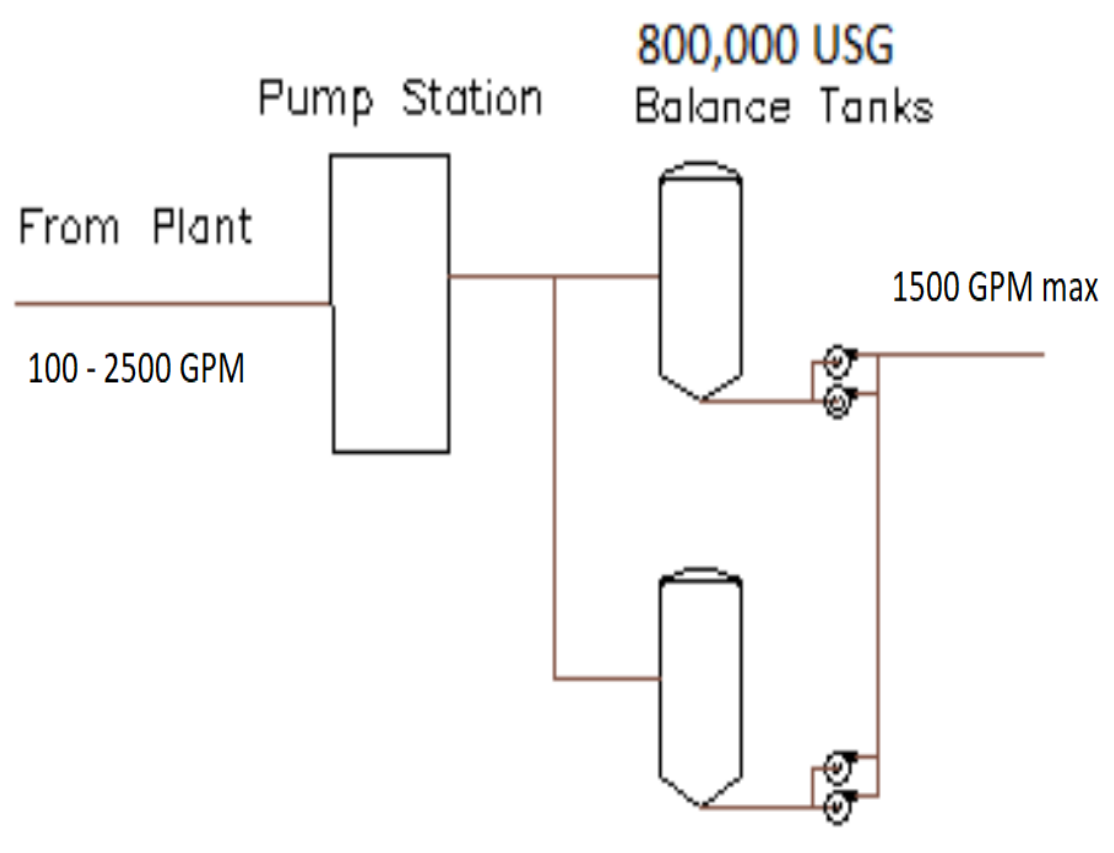
Flow Monitoring – Balance Tanks



- Seeq used to analyze tank levels, time before full, and send email notifications
  - Pull in tags
  - Estimate remaining level
  - Estimate remaining time
  - Set up email notifications to be sent if capsule is created

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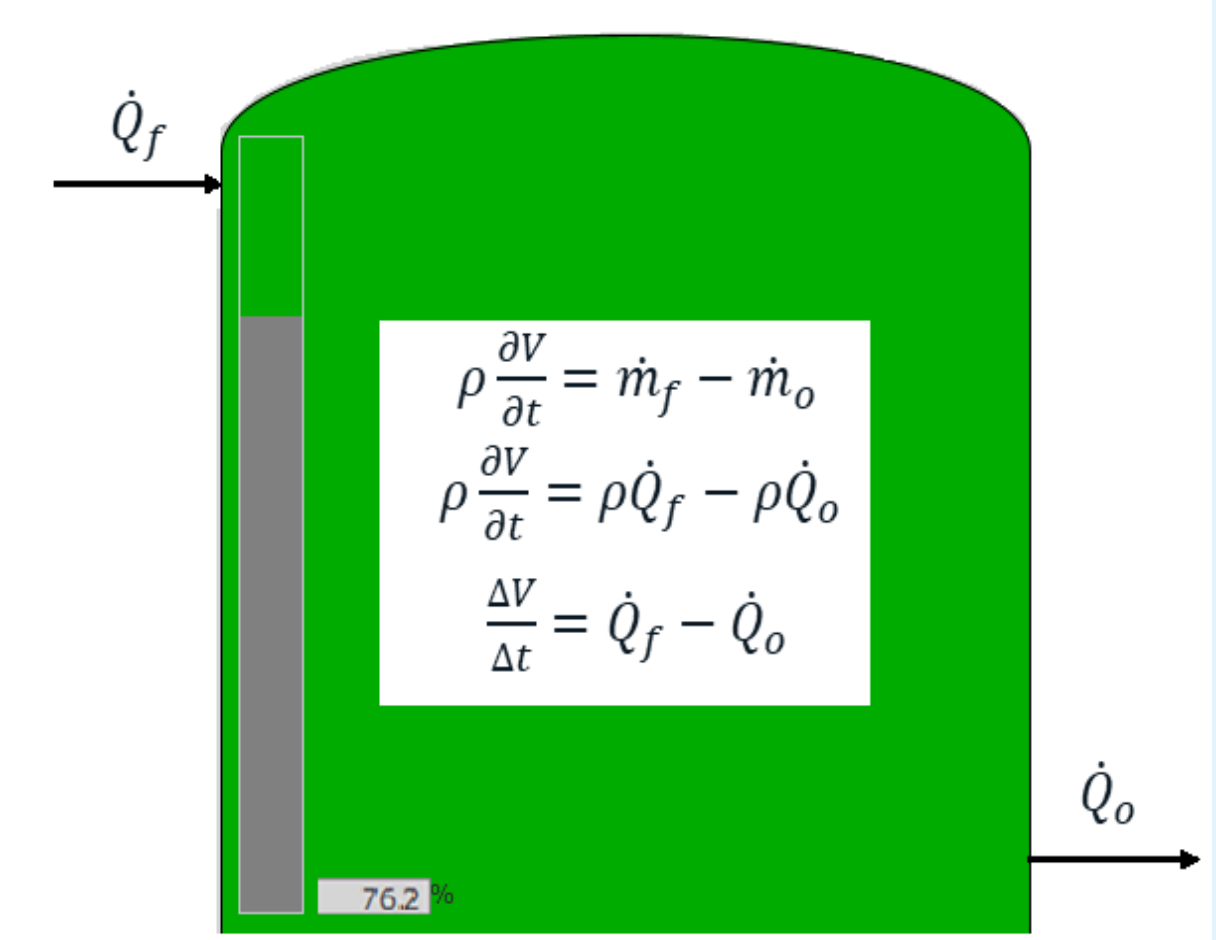
Flow Monitoring – Balance Tanks

- Mass balance around tanks
  - Started with a simplified version for the conservation of mass

- Mass flowrates can be converted to volumetric flows assuming the density is constant



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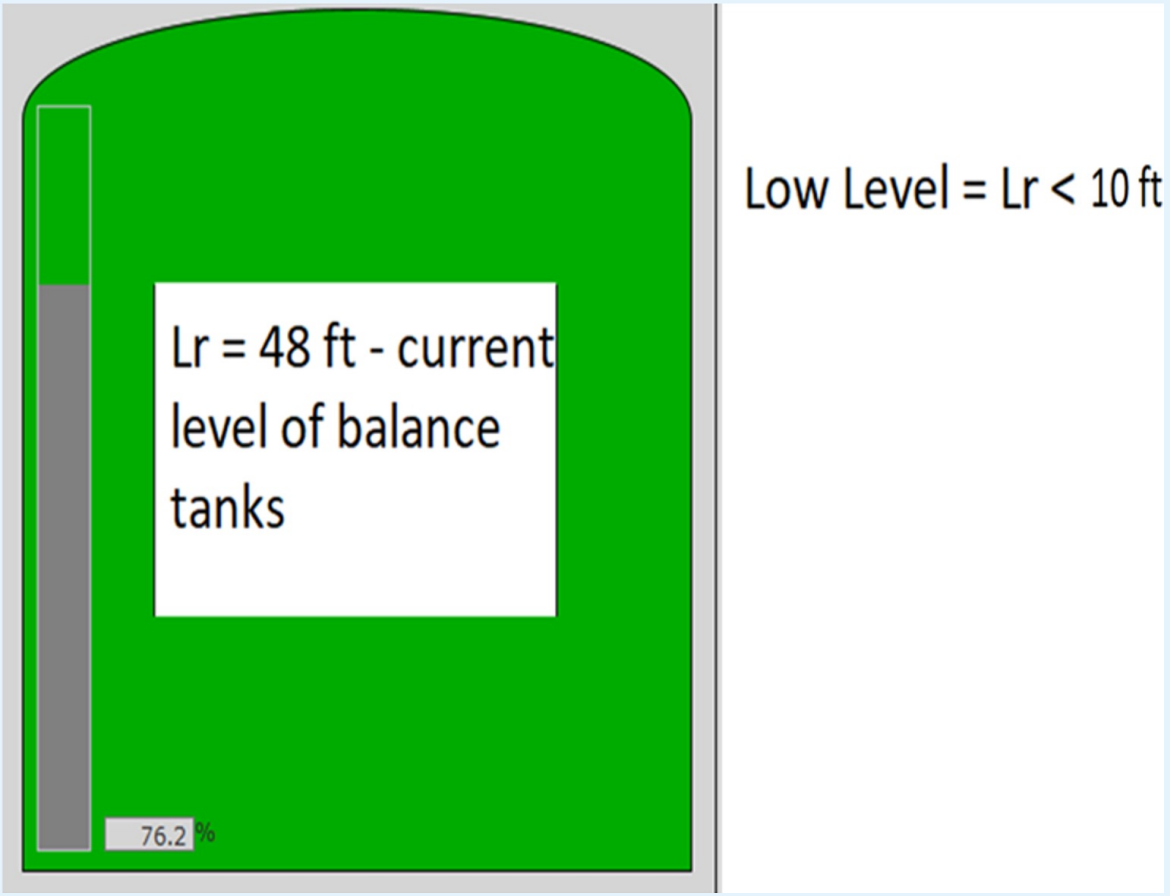
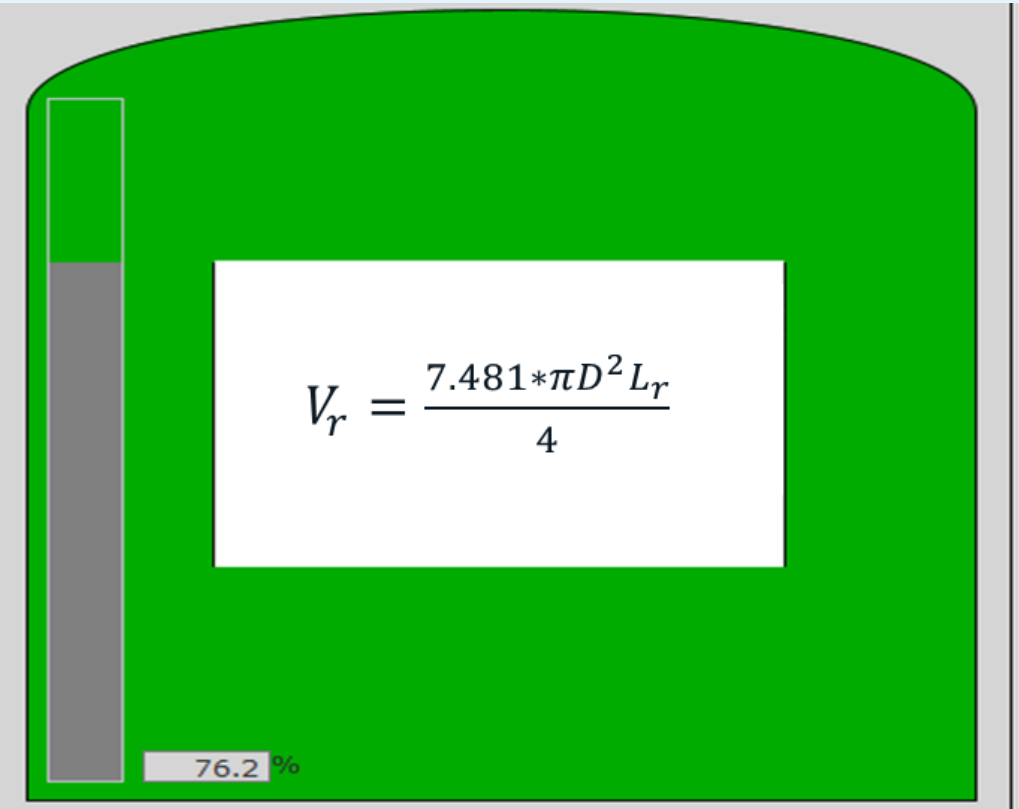
Flow Monitoring – Balance Tanks

- Used Seeq formula to estimate the remaining level

- Capsule created if the time remaining level is less than 10
  - Define Low Level = L_r < 10 ft



Flow Monitoring – Balance Tanks



- $t_r = \frac{Vr}{(\dot{Q}_f - \dot{Q}_o) * 60\ min/hr}$
  - .remove(islessthan(0))
    - Note that outflow is 1500 gpm

Tanks overfilling when $t_r < 12$

- Estimated remaining volume and converted to gallons
- Estimated remaining time

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Flow Monitoring – Balance Tanks

- Estimated remaining volume and converted to gallons
- Estimated remaining time for tanks to fill
- Defined tanks as overfilling when T_r < 12 hrs
  - Created composite condition using intersection and **set up email notifications**
  - Define Discuss Flow Changes = Low Level AND Tanks overfilling Intersect

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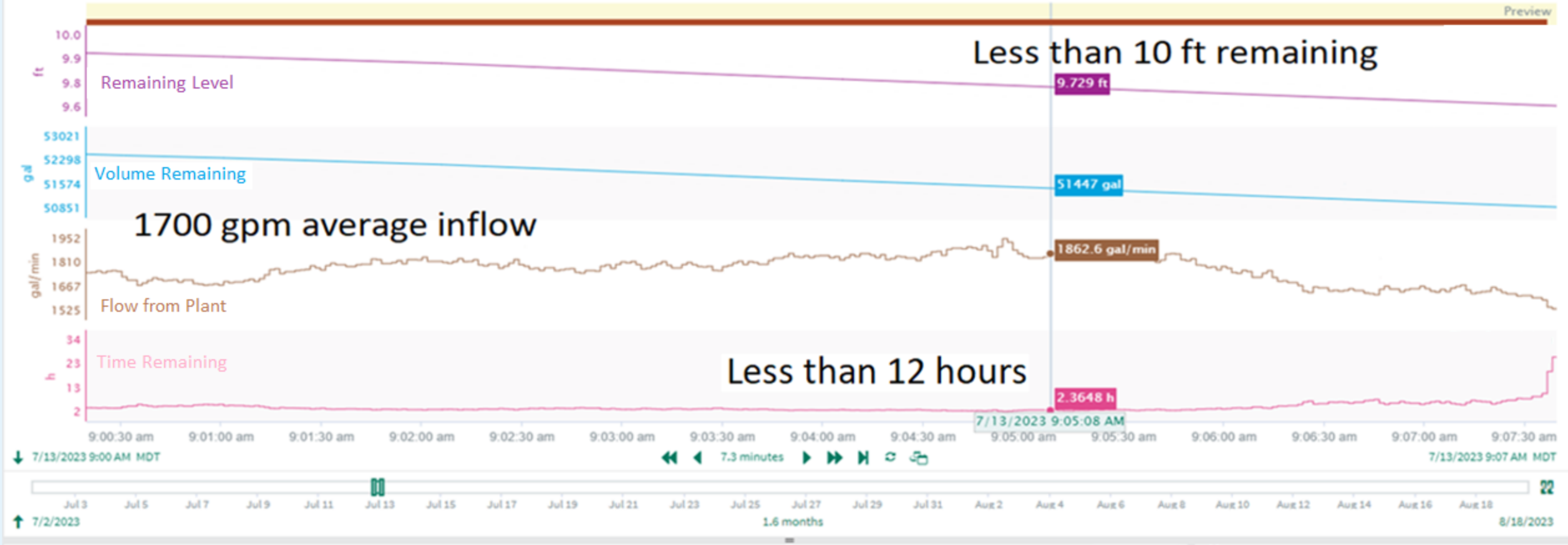

Details

Jul 13, 2023 9:05 AM | Customize

Name	Asset	Lane	
High Level	CalamityTank_Primary_LIT, EQ3Tank_Primary_LIT	1	
Tanks Overfilling	CalamityTank_Primary_LIT, EQ3Tank_Primary_LIT, All Analog Tags	2	
Discuss Flow Changes	CalamityTank_Primary_LIT, EQ3Tank_Primary_LIT, All Analog Tags	3	
ft In	EQ3Tank_Primary_LIT	4	
ft In	CalamityTank_Primary_LIT	5	
ft Remaining Level	CalamityTank_Primary_LIT, EQ3Tank_Primary_LIT	6	9.729
gal Volume Remaining	CalamityTank_Primary_LIT, EQ3Tank_Primary_LIT	7	51447
gal/min FT_WWEQ_21	All Analog Tags	8	1862.6
h Time Remaining	CalamityTank_Primary_LIT, EQ3Tank_Primary_LIT, All Analog Tags	9	2.3648

Capsules

Start

No results found in the display range

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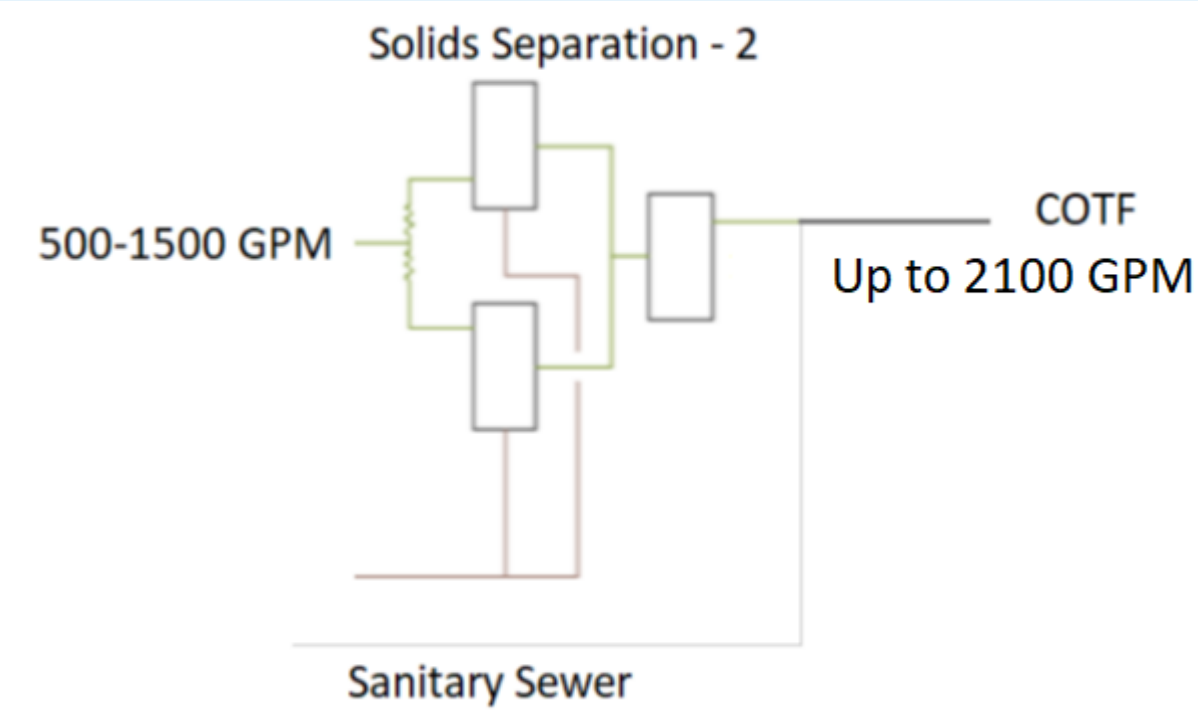
SOLUTION 2

Chobani Waste Treatment PFD



- Waste treatment and sanitary sewer combine flows before sending to COTF
- The flow from the sanitary sewer cannot be easily controlled
- The flow from wastewater **can be managed using the balance tanks** and **slowing down flows** through treatment

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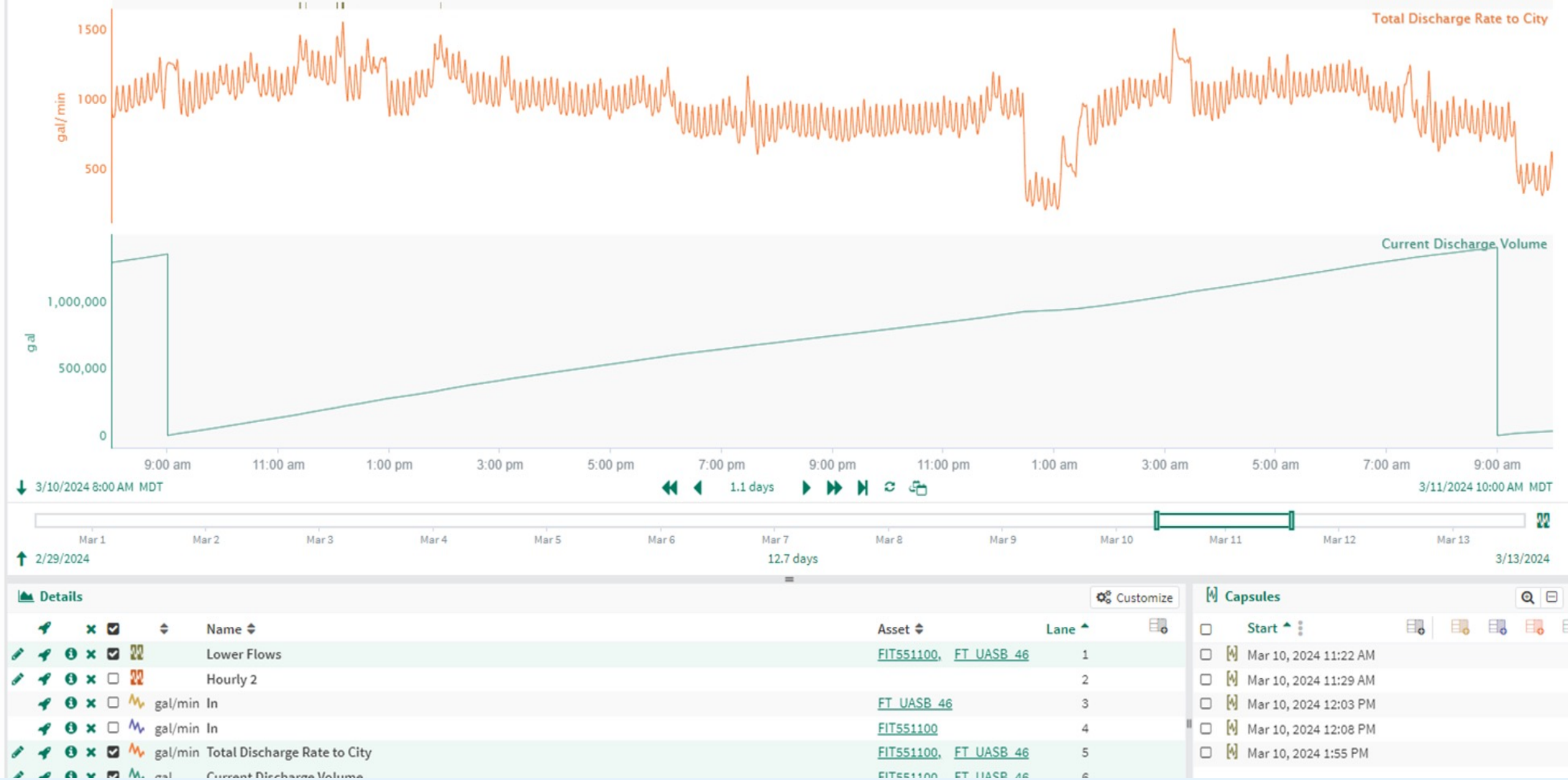
Predicting Total Discharge

- Estimated volume to the City of Twin Falls by using a running totalizer starting at 09:00

Current Volume = (Flowrate from sewer + Wastewater discharge rate)
.integral(days().move(15 hours))



Details

Customize

	Name	Asset	Lane
✎	Lower Flows	FIT551100, FT_UASB_46	1
✎	Hourly 2		2
	gal/min In	FT_UASB_46	3
	gal/min In	FIT551100	4
✎	gal/min Total Discharge Rate to City	FIT551100, FT_UASB_46	5
✎	gal Current Discharge Volume	FIT551100, FT_UASB_46	6

Capsules

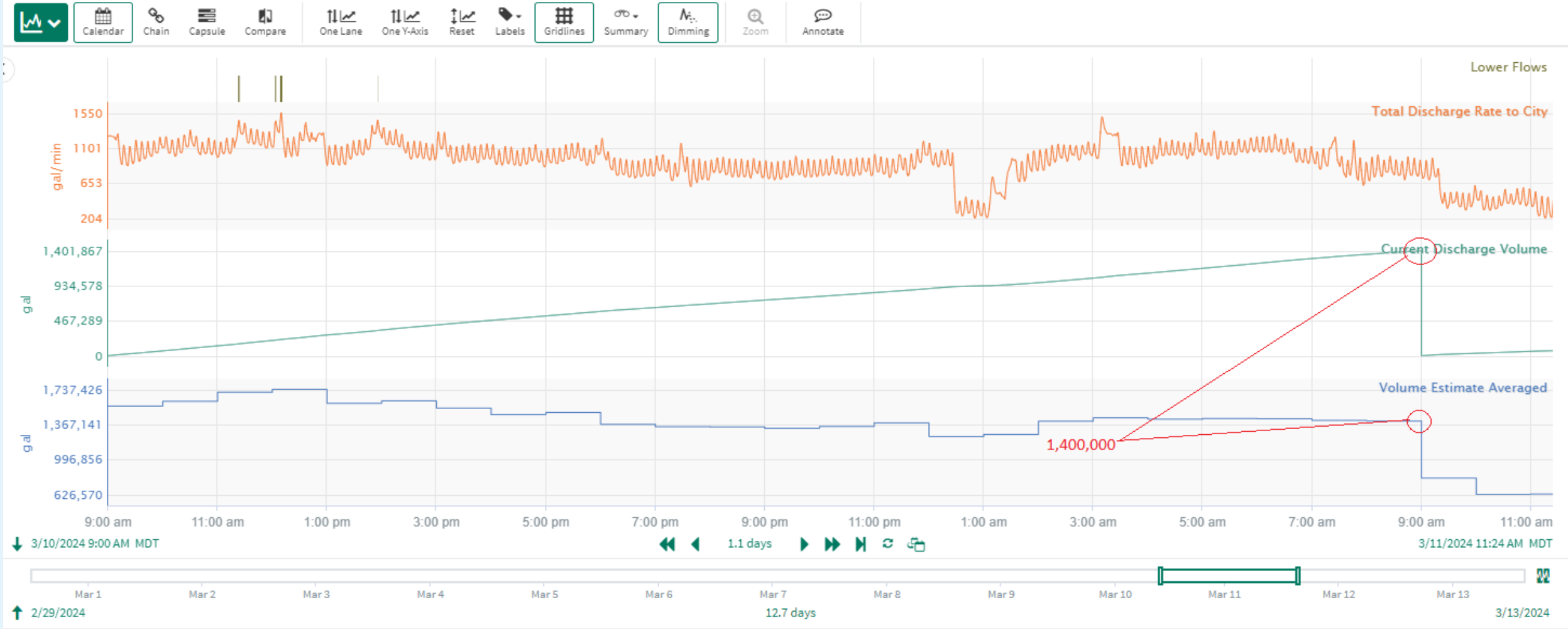
Start
Mar 10, 2024 11:22 AM
Mar 10, 2024 11:29 AM
Mar 10, 2024 12:03 PM
Mar 10, 2024 12:08 PM
Mar 10, 2024 1:55 PM

Predicting Total Discharge

- Estimated time left and made sure to reset ever day at 09:00
  - *Time Left = 1440-timeSince(days(),1 min).move(15 hours)*

- Estimated volume at the end of the 24-hour period
  - *Volume Estimate = Current Total Volume + (Flowrate from sewer + Wastewater Discharge rate) * Time Left*

- Averaged the **volume estimate** so operations understands **total discharge volume** and can **make proactive adjustments**



Details

Customize

	Name	Asset	Lane
	Lower Flows	FIT551100, FT_UASB_46	1
	Hourly 2		2
gal/min	In	FT_UASB_46	3
gal/min	In	FIT551100	4
gal/min	Total Discharge Rate to City	FIT551100, FT_UASB_46	5
gal	Current Discharge Volume	FIT551100, FT_UASB_46	6
min	Time Left		7
gal	Volume Estimate	FIT551100, FT_UASB_46	8
gal	Volume Estimate Averaged	FIT551100, FT_UASB_46	9

Capsules

Start
Mar 10, 2024 11:22 AM
Mar 10, 2024 11:29 AM
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Mar 10, 2024 1:55 PM

Page: 1

1

Summary

- Seeq was used to **balance flows** for efficient treatment and **monitor total discharge** to COTF
  - This information has proven extremely useful when performing maintenance activities
  - This provides operations with powerful information to increase or decrease flow rates through the wastewater treatment plant

- Achieved company **ESG goals**

- **Reduced annual permit exceedances by 95%**

Operations Support

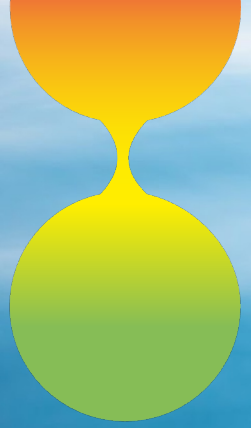
- **Worked side by side** with operations teams to understand key issues
- Presented the Seeq solution to **get buy-in**
- Provided **training to operators** to explain how to read the results

Next Steps

- **Reduce product waste** to drain from the Chobani plant
  - Work with operators and engineers to optimize pipe cleaning and flushes

- New sensor on wastewater discharge to COTF
  - Create a model to **predict total solids** discharge by end of day

- Provide information to the operations team
  - Keep **below permit limits for solids** sent to COTF



Thank you

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