

GLWA Northern Region Transmission

Water Service Area (Including Backups)





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Average Plant Operational Parameters

Average Daily Demand: 120 to 220 MGD

Floc & Settling

- Chlorination Points
 - Pre-chlor: Downstream of Low Lift Pumps \geq
 - Post-chlor: Post Filtration
- Average Chlorination Residual: 1.25 mg/L
- TOC of Influent Water: RAA approx. 1.9 mg/L



Meter Pit

Clearwell #1

120" Water Transmission Main Break Burtchville Twp Only Remaining Customer Connected to Plant Burtchville Twp Average daily demand: 0.1 MGD

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Arcadis Reaches out to Plant				
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Understood	Offered	Brought	Held three	Kept i <mark>n</mark>
gravity of	assistance	together	independent	touch with
situation	to help plant	Arcadian	brainstorming	plant
	maintain	Water	sessions	operations
	water	Treatment		
	quality	Experts		An

Plant Water Quality at Start of Break

- Stored Finished Water: 27.5 MG
- Chlorine Residual Decay Started at 1.2 mg/L
- EGLE Minimum Chlorine Residual: 0.5 mg/L



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Challenge No. 2 Chlorine Residual Quicker than Anticipated



GLWA Brainstorms Water Quality Options



Do Nothing and keep **Burtchville** Twp. On

Boiled Water Alert (NOT AN OPTION)



Circulate Water with Wash Water Injector

Route Chlorine Pumps to High Lift



Chlorinate with Sodium **Hypochlorite**



Dewater and Turn On Low Lift Pumps



Option 1: Do Nothing

Pros:

- Lowest operational challenge
- Over 4 MG of water available

Cons:

- Chlorine residual drops below 0.2 ppm
- Additional start-up considerations for chlorinating clearwells



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Option 2: Circulate Water with WW Pump

Pros:

Circulates water from HL suction well through all clearwells

Cons:

Unconventional operation of filters - would need to operate filters and backwash system manually at same time

To Filtered Water Conduit



Option 2: Circulate Water with WW Pump



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Option 3: Route CI2 Injector to HL

Pros:

- Significant mixing occurring in the suction well
- Could do in-house relatively quickly

Cons:

- Need 30 ft additional piping
- No monitoring prior to plant effluent









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Option 5: Dewater and Turn on LL

Pros:

Operation from LL to clearwells is close to normal operation (lower, but tested flow rate)

Cons:

Short term solution

 Dewatering capabilities limited



Outside Perspective

GLWA asks Arcadis to join GLWA Brainstorm session to:

- Validated GLWA's options
- Agree on options to take to EGLE
- Review what, if anything, is missing
 - Challenge 3 Refreshing plant water due to low flow

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Options No. 2 and 3 Maintaining Chlorine Residual Values & Water Quality Selected

- GLWA presented options No. 2 and 3 to EGLE
- EGLE provided approval to proceed with both options
- EGLE asked GLWA to monitor disinfection byproducts weekly



Challenge No. 3 Refreshing Plant Water

With only 0.1 MGD of water usage, the plant had to find ways to waste water so it could refresh with new water. This was done by a continuous cycle of filter backwashing

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Refreshing Plant Water - Filter Backwashing

- Reduced stored finished water
- Avoided Stagnation of water in Floc Basins, filters, and plant water conduits
- Kept plant water quality optimized reduced DBP levels
- Kept Chlorine Residual Optimized
- Allowed plant to immediately start average operation upon completion of 120" transmission main repair











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