IAPMO R&T LAB

TEST REPORT

5001 East Philadelphia Street
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http://www.iapmortl.org

Report Number: 4241-26005 **Project Number:** 48065

Report Issued: April 8, 2026

Tested For: Renew Water LLC
2010 Goodrich Ave
Austin TX, 78704

Source of Sample: Sample was shipped to IAPMO R&T Renew Water and was received in good condition on December 29, 2025

Test Date(s): January 20-April 6, 2026

Test Location: IAPMO R&T Lab
5001 E. Philadelphia St, Ontario, CA 91761

Product(s) Tested: Jaco Model 1 Disinfection System

Code/Standard: Research and Development Based on NSF 50-2025

Scope of Testing: Chlorine output/Chloramine Reduction/PFAS/ Urea/E.coli reduction.

Conclusion: The sample achieved a maximum log reduction of 8.95 in the return line when operating without salt see E.Coli Test #1.
It also achieved a log reduction of 6.2 in the supply tank using residual disinfectant after the unit was turned off (See E.Coli test #5) without using salt.

Report Status: **COMPLETE**

Reviewed / Submitted by:

Sal Aridi
Director

This is a breakout of report number 4241-26003, it is issued to present only the E.Coli disinfection data.

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E.Coli Test #1:

Same setup as chlorine
Supply water volume= 500 gallons
Startup Free Chlorine= 0.01 mg/L
pH=7.90
TDS=260.2 mg/L
Power set to 83%
Resulting power to cells 0.411 KVA

E.Coli Strain= AATC#11229 was used in all the E.Coli tests

Add the stock to the water described above, run the pump to circulate the mixture through the sample for 30 minutes. During this time the sample was OFF.
Take triplicate challenge water samples out of the heat exchanger line of the unit under test (UUT)
Start the UUT and check set power to 83% on the HMI, Resulting power to cells=0.411 KVA
After 10 minutes of startup take sample #1 downstream of filter on the return line to the tank.
After 20 Minutes of startup take sample #2 downstream of filter on the return line to the tank.
After 30 Minutes of startup take sample #3 downstream of filter on the return line to the tank.
Turn Sample OFF
After 60 Minutes of startup take sample #4 downstream of filter on the return line to the tank.
After 90 Minutes of startup take sample #5 downstream of filter on the return line to the tank.
After 120 Minutes of startup take sample #6 downstream of filter on the return line to the tank.
Results:

Sample Description	E.Coli Count	Log Reduction
Challenge Sample "C"	9 x 10^7 (MPN)	
Effluent #1 10 minutes after startup	1	7.95
Effluent #2 20 minutes after startup	0	8.95
Effluent #3 30 minutes after startup	0	8.95
UUT OFF		
Effluent #4 60 minutes after startup	0	8.95
Effluent #5 90 minutes after startup	0	8.95
Effluent #6 120 minutes after startup	0	8.95

Table 1- E.Coli

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E.Coli Test #2

Supply water volume= 500 gallons
Startup Free Available Chlorine= 0.02 mg/L
Total Chlorine 0.03
pH=7.99
TDS=195.5 mg/L
Temperature= 20.1°C
Power set to 35 %
Resulting power to cells 0.093 KVA
KW=0.080
KVAR=0.045

Test Procedure

1. Fill 500 gal tank with filtered water and take TDS, Cl and other relevant measures.
2. Spike tank to log9 E-coli concentration as before.
3. Turn pump on and run for ~30 mins with Reactor Off.
4. Take sample #1 from both tank and filter exit.
5. Turn Reactor On. (t= 0min)
6. Record kW, kVA and kvar of unit.
7. At t = 1 min, take sample #2 from tank and filter exit
8. At t = 4.5 min take sample #3 from tank and filter exit.
9. At exactly t = 5 min, turn unit off – 20 % of tank volume will be treated by unit.
10. At t = 6 min take sample #4 from tank and filter exit.
11. At t = 15 min take sample # 5 from tank and filter exit and record TDS.
12. At t = 30 min take sample #6 from tank and filter exit.
13. At = 60 min take sample #7 from tank and filter exit and record TDS.

Record Sample #	Time after Reactor Start (min)	Measuring Point	Free Available Chlorine (mg/L)	E- Coli Count (MPN)
1	-3	Tank Filter Exit	Resulting Power was too low. Test samples were not analyzed.	
2	1	Tank Filter Exit		
3	4.5	Tank Filter Exit		
4	6	Tank Filter Exit		
5	15	Tank Filter Exit		

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6	30	Tank Filter Exit	
7	60	Tank Filter Exit	

Table 2- E.Coli

E.Coli Test #3

Free Available Chlorine<0.02 mg/L
pH=73952
TDS=676 mg/L
Set power to ~60%
Resulting Power to Unit: 0.156 KW, 0.200 KVAR, 0.254 KVA

Test Procedure
1. Fill 500 gal tank with filtered water and take TDS, Cl and other relevant measures.
2. Spike tank to log9 E-coli concentration as before.
3. Turn pump on and run for ~30 mins with Reactor Off.
4. Take sample #1 from both tank and filter exit.
5. Turn Reactor On. (t= 0min)
6. Record kW, kVA and kvar of unit.
7. At t = 1 min, take sample #2 from tank and filter exit.
8. At t = 3 min record kW, kVA and kvar of unit.
9. At t = 4.5 min take sample #3 from tank and filter exit.
10. At exactly t = 5 min, turn unit off – 20 % of tank volume will be treated by unit.
11. At t = 6 min take sample #4 from tank and filter exit.
12. At t = 15 min take sample # 5 from tank and filter exit and record TDS.
13. At t = 30 min take sample #6 from tank and filter exit.
14. At = 60 min take sample #7 from tank and filter exit and record TDS.
15. At = 120 min take sample #8 from tank and filter exit and record TDS.

Sample #	Time after Reactor Start (min)	Measuring Point	Cl (Free and Total)	E- Coli Count (MPN)	Log Reduction
1A	Challenge (0)	Tank		3600	NA
1B	Challenge (0)	Filter Exit		5320	NA
2A	1	Tank		209600	NA (Base)
2B	1	Filter Exit		29600	NA
3A	4.5	Tank		174800	0.08

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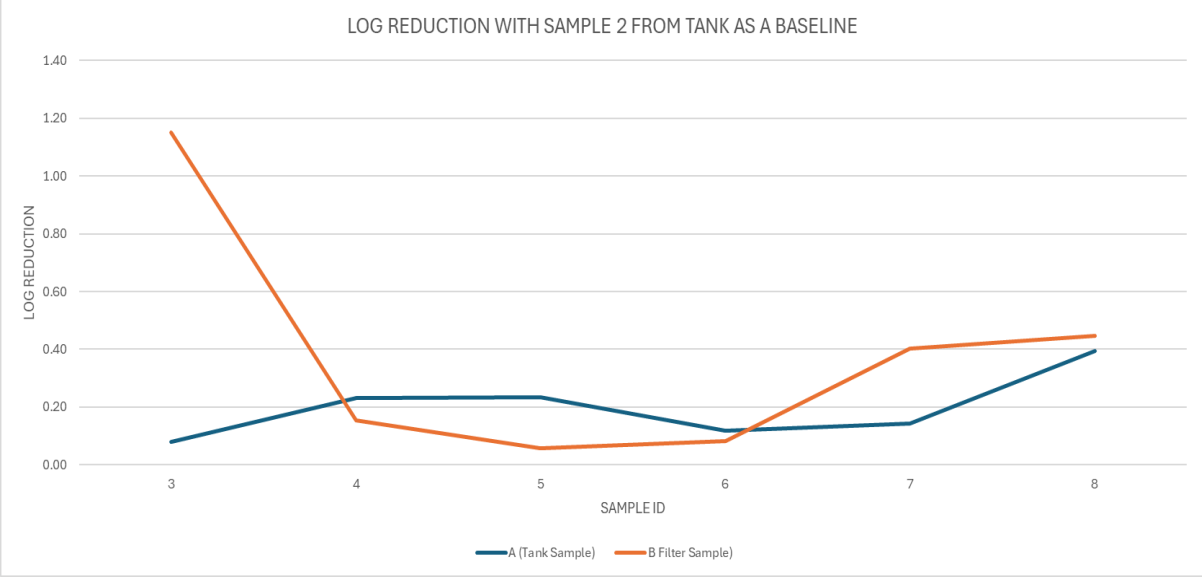
3B	4.5	Filter Exit		14800	1.15
UUT OFF	5	Unit is turned off			
4A	6	Tank		122800	0.23
4B	6	Filter Exit		147200	0.15
5A	15	Tank		122400	0.23
5B	15	Filter Exit		184000	0.06
6A	30	Tank		159600	0.12
6B	30	Filter Exit		172800	0.08
7A	60	Tank		150800	0.14
7B	60	Filter Exit		82800	0.40
8A	120	Tank		84400	0.40
8B	120	Filter Exit		74800	0.45

Table 3- E.Coli

Log calculation Formula = ABS (log(E.Coli (3A) / E.Coli (2A)) = ABS(log(174800/209600))
=ABS(-0.08)
=0.08

Sample 2A was used as a baseline for all the log calculation since the challenge samples were inexplicably low.



Graph 1 – Log Reductions of the Samples Taken out of the Prefilter Exit as Well as the Supply Tank

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E.Coli Disinfection Test # 5

1. Fill 500-gal tank with filtered water and take TDS, Cl, pH, and other relevant measures. (pH is important to determine OH production.)
2. Spike tank to log E. Coli concentration.
3. Turn pump on and run for ~30 mins with reactor *OFF* at the main power switch.
4. Take challenge samples (sample #1) from both tank and filter.
5. Turn reactor *ON* at the main power switch. (t=0 minutes)
6. Record electrical values (kW, kVA, and kVARS) of unit and confirm that power setting is at >80% when the PLC screen turns on.
7. At t= 1 min, take sample #2 from the tank and filter.
8. At t= 4 min, record electrical values of the unit.
9. At t= 5 min, take sample #3 from the tank and filter. Test pH of samples.
10. At t= 9 min, take sample #4 from the tank and filter.
11. At exactly t= 10 min, turn unit *OFF* at the main power switch. Roughly 40% of the tank volume will be treated by the unit and, assuming perfect mixing in the tank, approximately 30% of the tank water will consist of treated water.
12. At t= 11 min, take sample #5 from the tank and filter.
13. At t= 15 min, take sample #6 from the tank and filter.
14. At t= 30 min, take sample #7 from the tank and filter.
15. At t= 60 min, take sample #8 from the tank and filter.
16. At t= 120 min, take sample #9 from the tank and filter.

Calculation of the Log reduction was based on the highest challenge count measured in the water after adding the E.Coli into the test tank in this case = 1.60E+08
Log=Log(E.Coli Out / E.Coli in)

Water Parameters at start: 0.04 ppm Free chlorine, 177.9 TDS, 8.178 pH

Results

ID #	Description	Count CFU	Dilution Factor	Final Count CFU	Log Red
1T	Challenge From Tank	71	1.00E+06	7.10E+07	NA
2	From Tank T=1 min	1076	100	1.08E+05	3.2
3	From Tank T=5 min	3188	100	3.19E+05	2.7
4	From Tank T=9 min	119	100	1.19E+04	4.1
SAMPLE OFF					

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5	From Tank T= 11 min	30	100	3.00E+03	4.7
6	From Tank T= 15 min	10	100	1.00E+03	5.2
7	From Tank T=30 min	5	100	5.00E+02	5.5
8	From Tank T=60 min	10	100	1.00E+03	5.2
9	From Tank T=120 min	33	100	3.30E+03	4.7
ID#	Description	Count CFU	Dilution Factor	Final Count CFU	Log Red
1F	Chal .From Filter	160	1.00E+06	1.60E+08	NA
2F	From Filter	1	100	1.00E+02	6.2
3F	From Filter	1	100	1.00E+02	6.2
4F	From Filter	0	100	0.00E+00	8.0*
SAMPLE OFF					
5F	From Filter	5	100	5.00E+02	5.5
6F	From Filter	12	100	1.20E+03	5.1
7F	From Filter	1	100	1.00E+02	6.2
8F	From Filter	20	100	2.00E+03	4.9
9F	From Filter	3	100	3.00E+02	5.7
*There were 0 colonies, the 8 log was based on the amount of E.Coli in the challenge					

Table 4- E.Coli

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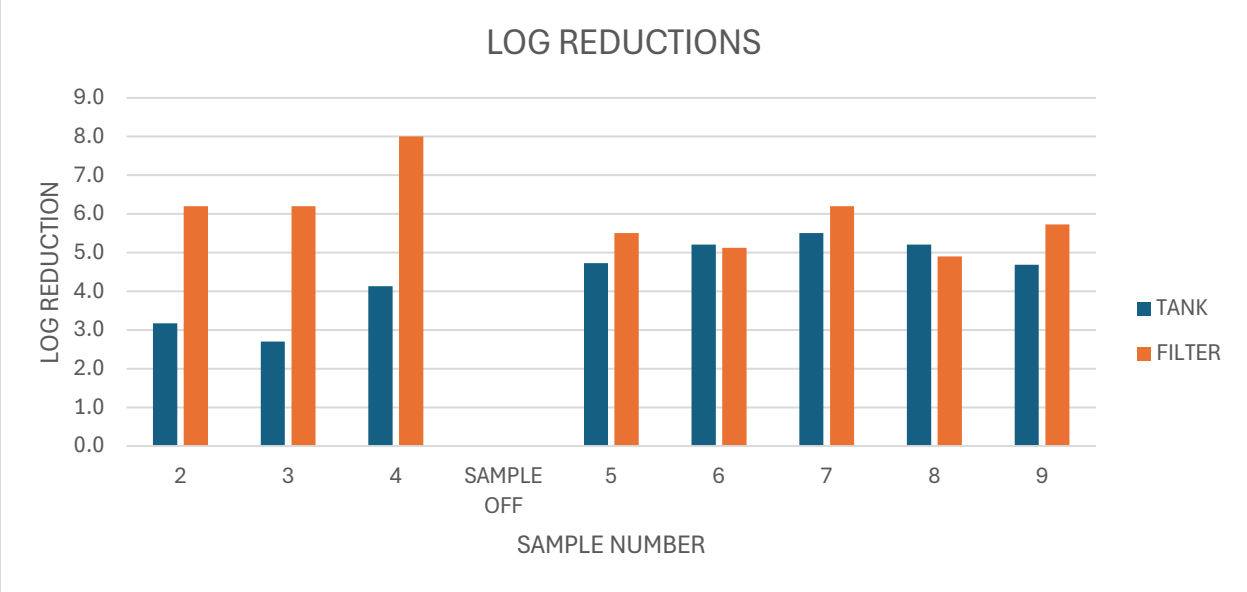

Graph 2 – Log Reductions of the Samples Taken out of the Prefilter Exit as Well as the Supply Tank Test # 5

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Figure 1- Sample Under Test

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Figure 2 – Sample Operating Parameters During E.Coli Test #5