Northeast Water Solutions, Inc.

3RD QUARTERLY PILOT PLANT REPORT
PILOT PLANT EVALUATION
MAY-JUNE, 2023

MANGANESE REMOVAL FROM
PRE-FILTERED SURFACE WATER
USING
GREENSAND PLUS FILTRATION

PREPARED FOR

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EXECUTIVE SUMMARY

Housatonic Water Works Co. (HWWC) and NWSI performed an initial "quarterly" (Q1) pilot plant program in September 2022 and then a Q2 pilot plant program in January 2023 to assess and evaluate the effectiveness of the Greensand Plus Filtration treatment process in removing manganese from the Long Pond source water under various seasonal conditions. A comprehensive evaluation of the pilot plant operating and performance data determined that this treatment process has been effective for removal of manganese, and shown no deleterious side effects or by-products, over a nominal 2-week operating duration for each pilot plant program. Upon completion of each pilot plant program, NWSI conducted a shut-down of the pilot plant, for temporary storage on-site, until re-activation for the subsequent quarterly test program.

HWWC and NWSI re-activated the pilot plant treatment system and conducted a third quarterly (Q3) pilot plant program in May-June 2023, entailing continuous operation for 15 days to evaluate the pre-summer operating conditions and source water characterization. During the Q3 pilot plant program the system experienced minimal to trace manganese levels in the Long Pond source water, consistent with expectations based upon the prior operating history of the HWWC system. The source water manganese concentration was detected at 0.0292 mg/L, slightly above the source water manganese (0.00936 & 0.0153 mg/L) identified during the Q2 (January, 2023) pilot plant, and less than the USEPA Manganese SMCL (0.05 mg/L).

The GSF influent water samples demonstrated total manganese of non-detectable levels (<0.00204 mg/L) to 0.0121 mg/L, averaging 0.0066 mg/L, indicating that some manganese in the raw source water was captured within the Slow Sand Filters upstream of the greensand filters. The substantial majority (42 of 45 total samples) of the GSF effluent samples demonstrated non-detectable manganese (<0.00204 mg/L). Three (3) effluent samples demonstrated trace manganese at concentrations ranging from 0.00255 to 0.0029 mg/L, barely above the detection limit.

Consistent with the prior Q1/Q2 pilot plant operation, the three (3) greensand filters were operated in parallel at average hydraulic loading rates of 1.9 gpm (3.5 gpm/ft^2), 3.1 gpm (5.6 gpm/ft^2) and 4.0 gpm (7.2 gpm/ft^2) respectively. The filters demonstrated similar performance over the hydraulic load range, consistent with their design criteria. It should be noted that the very low manganese and TSS loading (principally "non-detectable") were consistent with expectations for the seasonal operation. The monitoring of the spent filter backwash water determined that a 10-12-minute duration was effective, again consistent with expectations based on the low manganese and suspended solids loading to the filters.

Total organic carbon (TOC; 2.61 & 2.68 mg/L) and dissolved organic carbon (DOC; 2.75 & 2.71 mg/L) in the raw source water was low, with virtually all of the organic carbon in the dissolved form. The Q3 TOC concentrations were lower than identified in the Q1 (September 2023) source water (TOC; 3.30 to 3.56 mg/L) which is expected due to the seasonal impact upon TOC sources in this surface water watershed. Additionally, the Q3 raw source water TOC was also lower than detected in the Q2 (January, 2023) pilot plan (TOC = 2.91 to 3.08 mg/L).

The Slow Sand Filters demonstrated a TOC reduction of 50.0 - 57.9% across the filter beds, with SSF #1 demonstrating a relatively lower TOC removal (50.7%) and DOC removal (50.5%) when

compared to SSF #2 TOC removal (57.8%) and DOC removal (57.7%). No significant removal of TOC occurred through the Greensand Filtration process.

The GSF influent demonstrated TTHMs at 22.4 and 23.3 ug/L compared to the GSF effluent TTHMs of 18.1 and 22.8 ug/L (avg. = 20.5 ug/L). The GSF influent demonstrated HAA5 at 17.3 ug/L compared to the GSF effluent of 17 and 18.5 ug/L (avg. = 17.8 ug/L), indicating in both cases that the GSF operation had no impact upon DBPs formation.

Over the duration of the pilot plant program, the Greensand Filters demonstrated low free chlorine demand: GSF#1 demonstrated an average demand of 0.20 mg/L, GSF#2 an average demand of 0.15 mg/L and GSF#3 an average demand of 0.14 mg/L. The low chlorine demand is consistent with the very low (non-detectable to trace) manganese in the GSF influent. For comparison, the Q1 pilot plant (September, 2022) demonstrated a higher free chlorine oxidation demand of approximately 0.53 mg/L, due to the higher total manganese load (average 0.192 mg/L, range of 0.075 to 0.306 mg/L) in the Q1 GSF influent with approximately 24% of the manganese in the dissolved form. These findings demonstrate the need to adjust the chlorine dosage to control the filter effluent residual to optimize system performance for seasonal load conditions. To assure maintenance of full greensand media oxidative capacity, the filter effluent should contain a minimum chlorine residual of 0.5 mg/L. Therefore, the Q3 pilot plant results indicate a net influent free chlorine dosage of ≈ 0.7 mg/L, compared to the ≈1.0 mg/L dosage determined by the Q1 pilot plant program.

The operating cycle for each filter was initially programmed at 20,000 gallons, and then increased to 35,000-40,000 gallons. Each filter unit was backwashed upon completion of each operating cycle These extended operating cycles demonstrated steady-state performance from the standpoint of sustaining consistent pressure drop and hydraulic throughput across the filters, regardless of the hydraulic loading rates. No manganese breakthrough occurred during any operating cycle of the pilot plant run. The greensand filter pilot plant influent and effluent consistently demonstrated non-detectable turbidity (<0.100 NTU) therefore solids loading was reduced to a minimum.

The greensand filter backwash determined effective flushing of the majority of TSS occurred within 8 minutes on each backwash cycle, after which the backwash water demonstrated an extended “tail” of TSS, regardless of duration. Similarly, the backwash water manganese monitoring determined the majority of the particulate manganese was flushed within 8 to 10 minutes. Under these very low manganese loading conditions, no significant benefit would be derived from the use of an air-scour assist backwash.

Because there was no change in the overall water characterization, other than removing manganese, the greensand filtration process has no adverse impact upon the corrosion potential of the finished water. Both the raw and finished water have a very low corrosion potential, that is unaffected by both the existing treatment process and the proposed greensand filtration treatment.

The greensand filtration system performance was unaffected by organic loading, monitored as total organic carbon (TOC), dissolved organic carbon (DOC) and UV254. Additionally, the greensand filtration treatment had no practical impact upon formation of disinfection-by-products.

Based on the findings in the Q1, Q2 and Q3 pilot plant programs, the following recommendations are presented for consideration:

- The greensand filtration process will function effectively over a hydraulic loading range of 3.5 to 7.5 gpm/ft^2;

- It is recommended the full-scale system consist of four (4), 36" Ø x 72: S/S Ht. filter vessels, installed in parallel. During normal operation at 100 gpm, three (3) vessels would be on-line, with a nominal hydraulic load of 4.7 gpm/ft^2;

- The chlorine pre-oxidant dosage should be adjustable with a nominal free chlorine dosage range of 0.7 to 1.0 mg/L, to allow a minimum 0.5 mg/L free chlorine residual in the filter effluent;

- A backwash cycle duration of 10 minutes is recommended, at a nominal unit loading rate of 12 gpm per square foot of filter bed area. Use of a low pressure, dry, oil-free air-scour backwash assist is recommended to enhance backwash efficiency, particularly during periods when the water temperature is greater than 60ºF. Use of an air scour assist can reduce the backwash water requirement by approximately 60%, to 4.5 gpm per square foot of filter bed area.

- Spent backwash water may be discharged to the on-site lagoon system currently used for disposal of the slow sand filter wash water.

The pilot plant program was performed by Northeast Water Solutions, Inc., under the direct supervision of a Massachusetts Registered Professional Engineer. The day-to-day pilot plant operation was performed by a Massachusetts certified public water system operator (Grade 2T, 3T-OIT).

I. PILOT PLANT RESULTS AND EVALUATION

The Greensand Filter (GSF) pilot plant operated continuously for 15 days from May 30th to June 14th, 2023. The operating variables monitored during the pilot plant operation include, but are not limited to, the following:

- Raw Source Water & Greensand Filter Influent Water Characterization;
- Hydraulic Loading;
- Manganese Loading and Removal Efficiency;
- Chlorine Dosage and Operating Efficiency;
- Backwash Flowrate, Volume, and Manganese Concentration;
- Disinfection By-Products Formation

Pilot plant operating/performance and backwash data including laboratory analytical reports are presented in Appendix A and B.

1.1 Raw Source (Long Pond) Water Characterization

Table 1-1 presents the result of analyses of the raw source (Long Pond) water during the Q3 pilot plant program. Review comments include the following:

- The raw source water pH was at 8.15 S.U. (lab analytical result), within the historic monitoring (8/3/2020-3/21/2022) raw water pH range of 7.09 to 8.5 S.U., similar to the raw water pH demonstrated in the Q1 (9/21/2022 – 9/28/2022) pilot plant program (avg. = 7.93 S.U.) and Q2 (1/16/2023-1/27/2023) pilot plant program (avg. 7.92 S.U.), both within the range of USEPA SMCL of 6.5 to 8.5 S.U.

- The total organic carbon (TOC) demonstrated concentrations of 2.61 and 2.68 mg/L in comparison to the dissolved organic carbon (DOC) of 2.71 and 2.75 mg/L, indicating that virtually all of the organic carbon in the raw water is in the dissolved form. The TOC concentration in the Q3 raw source water is ≈20% lower than detected in the Q1 (September, 2023) pilot plant program (TOC = 3.30 to 3.56 mg/L) and ≈12% lower than in the Q2 (January 2023) pilot plant (TOC = 2.91 to 3.08 mg/L).

- The raw source water demonstrated UV254 (absorbance/cm) values of 0.049 and 0.051 in the Q3 pilot plant program. These values are slightly less than UV254 values of 0.077 and 0.087 determined in the Q1 pilot plant program and 0.056-0.065 determined in the Q2 pilot plant program.

  The Q3 raw source water SUVA values (UV/DOC in L/mg-m) were 1.85 and 1.81, lower than both Q1 raw source water SUVA (avg. ≈ 2.3) and Q2 raw source water SUVA (avg. ≈ 2.9). The raw water was considered to be "low SUVA" (≤ 3) through the entire (Q1-Q3) pilot plant program to date.

- The raw source water demonstrates a trace total manganese of 0.0292 mg/L, which is lower than the total manganese detected in Q1 (0.0451 mg/L) and slightly higher than the total manganese detected in Q2 (0.00936 and 0.0153 mg/L). The total manganese detected in Q3 pilot plant program consistent with the historic non-summer season monitoring demonstrating a range of 0.0128 to 0.0411 mg/L (avg. = 0.0202 mg/L). Dissolved manganese of 0.00312 mg/L (6/2/2023) indicates that ≈10% of the source water manganese is in particulate form.

- The raw source water demonstrated non-detectable (<0.0500 mg/L) iron.

Table 1-1
Raw Water Characterization Analytical Results

Sample Date	6/1/2023	6/2/2023	6/8/2023
pH (for UV254), S.U.	8.15	----	
Total Organic Carbon (TOC), mg/L	2.61	----	2.68
Diss. Organic Carbon (DOC), mg/L	2.75	----	2.71
UV254 (absorbance) /cm	0.051	----	0.049
SUVA (UV/DOC)	1.85	----	1.81
Mn, total, mg/L	----	0.0292	----
Mn (dissolved), mg/L	----	0.00312	----
Fe, total, mg/L	----	<0.0500	----

1.2 Greensand Filter Influent & Effluent Water Characterization

During the Q3 pilot plant program NWSI conducted field and laboratory monitoring of critical operational and performance parameters (Appendix A and B). Over the duration of the pilot plant program the raw source water and the greensand filter influent demonstrated a very consistent baseline characterization for all parameters. Findings and review comments include the following:

1.2.1 Influent & Effluent pH:

The GSF influent water pH was monitored, with GSF influent pH in the range of 7.37-7.53 S.U. (field monitoring results) and 7.27 to 7.67 S.U. (laboratory analytical results), which is below the raw water pH of 8.15 S.U. (laboratory analytical results). These results are generally consistent with the field pH monitoring during the Q1 (7.27 to 7.47 S.U.) and Q2 (7.5 to 7.76 S.U.) pilot plant programs, and are also consistency with the historic finished water range of 7.2 to 7.9 S.U. The field pH monitoring was reasonably consistent with the laboratory pH results.

GSF effluent has pH in the range of 7.11-7.41 S.U. (field monitoring results) and 7.26-7.66 S.U. (laboratory analytical results). The field monitoring results consistently demonstrate pH similar to, or slightly less than the influent pH. In all cases they are within USEPA Drinking Water Limits (6.5 to 8.5 S.U.).

Table 1-2A
pH Monitoring Results – GSF Influent and Effluent (S.U.)
Laboratory Analytical Results

Sampling Date	GSF Influent	GSF1 Eff	GSF2 Eff	GSF3 Eff
5/30/2023	7.67	7.31	7.37	7.49
5/31/2023	7.54	7.29	7.52	7.54
6/1/2023	7.57	7.26	7.50	7.51
6/2/2023	7.61	7.32	7.56	
6/4/2023	7.32	7.31	7.60	7.58
6/5/2023	7.30	7.38	7.30	7.33
6/6/2023	7.32	7.28	7.32	7.33
6/7/2023	7.32	7.33	7.35	7.30
6/8/2023	7.63	7.59	7.50	7.58
6/9/2023	7.29	7.32	7.29	7.49
6/10/2023	7.28	7.48	7.52	7.50
6/11/2023	7.27	7.49	7.46	7.48
6/12/2023	7.28	7.24	7.47	7.45
6/13/2023	7.29	7.27	7.27	7.26
6/14/2023	7.60	7.62	7.67	7.66

Table 1-2B
pH Monitoring Results – GSF Influent and Effluent (S.U.)
Field Monitoring

Sampling Date	GSF Influent*	GSF1 Eff*	GSF2 Eff*	GSF3 Eff*
5/30/2023	7.41	7.40	7.40	7.40
5/31/2023	7.42	7.39	7.39	7.4
6/1/2023	7.40	7.4	7.4	7.4
6/2/2023	7.37	7.4	7.4	7.4
6/4/2023	7.41	7.4	7.41	7.4
6/5/2023	7.42	7.4	7.4	7.4
6/6/2023	7.43	7.4	7.4	7.4
6/7/2023	7.42	7.21	7.27	7.30
6/8/2023	7.42	7.18	7.23	7.24
6/9/2023	7.42	7.34	7.27	7.29
6/10/2023	7.49	7.32	7.32	7.34
6/11/2023	7.53	7.22	7.23	7.23
6/12/2023	7.43	7.11	7.19	7.21
6/13/2023	7.43	7.14	7.11	7.12
6/14/2023	7.43	7.12	7.13	7.11

Note: * average value of the daily monitoring data

1.2.2 Turbidity:

The GSF influent water consistently demonstrated turbidity less than 0.100 NTU during the Q3 pilot plant program. These findings are consistent with the Q2 pilot plant program (January 2023) but are in sharp contrast to the Q1 (September 2022) pilot plant program that demonstrated influent turbidity of 0.83 to 2.77 NTU.

The Q3 GSF influent turbidity measurements are consistent with the measurements presented by the on-line monitoring of the slow sand filter effluent, which demonstrated a SSF #1 effluent

turbidity of 0.070 to 0.105 NTU (avg. 0.086 NTU) and a SSF #2 effluent turbidity of 0.019 to 0.023 NTU (avg. 0.020 NTU).

All GSF effluent monitoring demonstrated non-detectable (<0.100 NTU) turbidity.

Table 1-3A
Turbidity Monitoring Results– SS Effluent, GSF Influent and Effluent (NTU)
Laboratory Analytical Results

Sampling Date	GSF Influent	GSF Effluent		
		GSF #1	GSF #2	GSF #3
5/30/2023	<0.100	<0.100	<0.100	<0.100
5/31/2023	<0.100	<0.100	<0.100	<0.100
6/1/2023	<0.100	<0.100	<0.100	<0.100
6/2/2023	<0.100	<0.100	<0.100	<0.100
6/4/2023	<0.100	<0.100	<0.100	<0.100
6/5/2023	<0.100	<0.100	<0.100	<0.100
6/6/2023	<0.100	<0.100	<0.100	<0.100
6/7/2023	<0.100	<0.100	<0.100	<0.100
6/8/2023	<0.100	<0.100	<0.100	<0.100
6/9/2023	<0.100	<0.100	<0.100	<0.100
6/10/2023	<0.100	<0.100	<0.100	<0.100
6/11/2023	<0.100	<0.100	<0.100	<0.100
6/12/2023	<0.100	<0.100	<0.100	<0.100
6/13/2023	<0.100	<0.100	<0.100	<0.100
6/14/2023	<0.100	<0.100	<0.100	<0.100

Table 1-3B
Turbidity Monitoring Results, SS Effluent (NTU)
Field Monitoring – Online Analyzer

Date	Time	SSF#1 Effluent	SSF#2 Effluent
5/30/2023	8:00	0.086	0.020
5/30/2023	9:45	0.086	0.020
5/30/2023	11:35	0.086	0.020
5/30/2023	13:30	0.070	0.020
5/30/2023	17:45	0.086	0.020
5/30/2023	20:00	0.079	0.020
5/31/2023	7:30	0.081	0.020
5/31/2023	9:30	0.083	0.020
5/31/2023	11:15	0.083	0.020
5/31/2023	17:10	0.085	0.020

6/1/2023	7:15	0.079	0.020
6/1/2023	12:30	0.078	0.020
6/1/2023	13:30	0.079	0.020
6/1/2023	17:00	0.078	0.020
6/1/2023	19:10	0.078	0.020
6/2/2023	6:30	0.079	0.020
6/2/2023	7:30	0.080	0.020
6/2/2023	8:30	0.080	0.020
6/2/2023	9:00	0.080	0.020
6/4/2023	15:30	0.084	0.023
6/4/2023	16:30	0.084	0.023
6/5/2023	6:45	0.080	0.020
6/5/2023	9:00	0.080	0.020
6/5/2023	12:25	0.080	0.020
6/5/2023	18:15	0.080	0.020
6/6/2023	7:10	0.081	0.019
6/6/2023	8:00	0.081	0.019
6/6/2023	9:00	0.080	0.020
6/6/2023	10:05	0.080	0.020
6/6/2023	16:20	0.080	0.020
6/7/2023	7:00	0.083	0.019
6/7/2023	8:00	0.083	0.019
6/7/2023	10:45	0.084	0.019
6/7/2023	13:10	0.084	0.019
6/7/2023	16:45	0.084	0.019
6/8/2023	6:40	0.086	0.019
6/8/2023	9:00	0.086	0.019
6/8/2023	12:00	0.086	0.019
6/8/2023	14:30	0.086	0.019
6/8/2023	16:30	0.086	0.019
6/9/2023	6:50	0.086	0.019
6/9/2023	8:10	0.086	0.019
6/9/2023	11:30	0.086	0.019
6/9/2023	14:00	0.087	0.019
6/9/2023	16:00	0.087	0.019
6/10/2023	7:00	0.088	0.019
6/10/2023	9:00	0.088	0.019
6/10/2023	11:30	0.088	0.019
6/10/2023	14:00	0.088	0.019
6/10/2023	16:00	0.088	0.019

6/11/2023	7:00	0.090	0.019
6/11/2023	9:30	0.090	0.019
6/11/2023	12:00	0.090	0.019
6/11/2023	14:00	0.089	0.019
6/11/2023	16:00	0.090	0.019
6/12/2023	6:45	0.092	0.019
6/12/2023	10:00	0.093	0.019
6/12/2023	12:30	0.094	0.019
6/12/2023	14:00	0.094	0.019
6/12/2023	16:30	0.095	0.019
6/13/2023	7:00	0.098	0.020
6/13/2023	8:00	0.098	0.020
6/13/2023	10:00	0.105	0.020
6/13/2023	12:30	0.099	0.020
6/13/2023	15:45	0.100	0.020
6/14/2023	6:30	0.104	0.020
Average		**0.086**	**0.020**

1.2.3 Total Suspended Solids (TSS):

Summarized in Table 1-4, the GSF influent water demonstrates non-detectable TSS (<2.78 to <6.25 mg/L) for the entire duration of the pilot plant program. All GSF effluent samples also demonstrated non-detectable TSS (<2.78 to <6.25 mg/L).

Table 1-4
Total Suspended Solids (TSS) Monitoring
GSF Influent and Effluent (mg/L)

Sampling Date	GSF Influent	GSF Effluent		
		GSF #1	GSF #2	GSF #3
5/30/2023	<2.78	<2.78	<2.78	<6.25
5/31/2023	<2.78	<2.78	<2.78	<2.78
6/1/2023	<6.25	<2.78	<2.78	<2.78
6/2/2023	<3.13	<2.78	<3.13	<3.13
6/4/2023	<3.13	<2.78	<3.13	<3.13
6/5/2023	<2.78	<3.13	<2.78	<6.25
6/6/2023	<2.78	<2.78	<2.78	<2.78
6/7/2023	<2.78	<2.78	<3.3	<6.25
6/8/2023	<3.58	<3.13	<3.58	<3.58
6/9/2023	<3.13	<2.78	<6.25	<2.78
6/10/2023	<2.78	<3.13	<2.78	<2.78
6/11/2023	<2.78	<3.13	<2.78	<2.78
6/12/2023	<2.78	<2.78	<2.78	<6.25

6/13/2023	<3.13	<3.13	<3.13	<6.25
6/14/2023	<3.13	<3.13	<3.13	<3.13

1.2.4 Color:

Summarized in Table 1-5 the GSF influent water presents non-detectable (<1 CU) Apparent Color for the entire duration of the pilot plant program. The True Color was "0 CU" for all GSF influent monitoring samples in Q3 pilot plant program. Apparent Color includes color due to dissolved and suspended solids in the water sample, while True Color is measured after the sample has been filtered (0.45u filter porosity).

It should be noted that the GSF influent color was substantially lower than that was determined during the Q1 (September 2022) pilot plant program, when the GSF influent typically ranged from 30 to 60 CU. Historic monitoring has indicated an annual range of <1 to 50 CU, a summer season range of 10 to 45 CU, and an average value of 26 CU. The substantially reduced color in the GSF influent can be largely attributed to the seasonal impacts on suspended materials in the source water.

The GSF effluent demonstrated non-detectable Apparent Color (<1 CU) and True Color (0 CU) in all samples.

Table 1-5
Color Monitoring – GSF Influent and Effluent

Sampling Date	Parameter	GSF Influent	GSF Effluent		
			GSF #1	GSF #2	GSF #3
5/30/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
5/31/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
6/1/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
6/2/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
6/4/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
6/5/2023	Color-Apparent, CU	0	<1	<1	<1
	Color- True, CU	0	0	0	0
6/6/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
6/7/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
6/8/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0

6/9/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
6/10/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
6/11/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
6/12/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
6/13/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0
6/14/2023	Color-Apparent, CU	<1	<1	<1	<1
	Color- True, CU	0	0	0	0

1.2.5 Total (TOC) and Dissolved (DOC) Organic Carbon, UV 254:

Two (2) rounds of TOC, DOC and UV254 monitoring were conducted over the duration of the Q3 pilot plant program, including source water, Slow Sand Filter (SSF #1 and SSF#2) effluent, and the Greensand Filter (GSF) influent and effluent water. The findings of this analytical monitoring program are summarized in Table 1-6, including the following:

1.2.5.1 Total and Dissolved Organic Carbon: The monitoring data demonstrates the Organic Carbon in the raw water, and throughout the treatment system is virtually entirely in the dissolved form. The raw water TOC demonstrates an average concentration of 2.65 mg/L, with DOC demonstrating a slightly higher average concentration of 2.73 mg/L, indicating that all of the organic carbon in the dissolved form. The monitoring data demonstrates an average 54.3% reduction of TOC and 54.1% reduction of DOC across the Slow Sand Filters, with SSF #1 demonstrating a relatively lower TOC removal (50.7%) and DOC removal (50.5%) when compared to SSF #2 TOC removal (57.9%) and DOC removal (57.7%).

GSF Influent Organic Carbon: TOC/DOC concentration demonstrated no significant change following the Segment 1 chlorination, at the point of entry into the GSF filter pilot plant system.

The GSF effluent monitoring demonstrated non-detectable to minimal TOC/DOC reduction, at most, through the GSF filter system. The GSF effluent TOC averaged 1.11 mg/L, compared to 1.13 mg/L in the GSF influent. DOC demonstrated an average GSF effluent concentration of 1.14 mg/L, similar to the GSF influent (1.15 mg/L). This finding is consistent with expectations.

1.2.5.2 UV254: Source water demonstrated very low UV254 values (0.049 - 0.051 absorbance/cm) with an average 49.6% reduction through the Slow Sand Filters to a range of 0.021 to 0.029. Following Segment 1 chlorination the GSF influent demonstrated a further UV254 reduction to 0.018 to 0.019. The greensand filters had minimal further impact with GSF effluent demonstrating an average UV 254 of 0.017 absorbance/cm.

Table 1-6
Raw Water, Slow Sand Filter (SSF) Effluent,
GSF Influent and Effluent TOC, DOC & UV254 Monitoring Results

Sample Date/ Parameter	Source Water	Slow Sand Filter Effluent					GSF Influent		Greensand Filter Effluent				Total % Removal
		SSF #1		SSF #2		Overall % Removal	Conc.	% Removal	GSF	GSF #1	GSF #2	GSF #3	
		Conc.	% Removal	Conc.	% Removal								
June 1, 2023													
TOC, mg/L 1	2.61	1.27	51.3%	1.1	57.9%	54.6%	1.13	56.7%		1.12	1.11	1.11	57.3%[1]
DOC, mg/L	2.75	1.35	50.9%	1.14	58.5%	54.7%	1.15	58.2%		1.14	1.15	1.13	58.5%[1]
pH for UV254, S.U.	8.15	7.54	----	7.6	----	----	7.64	----		7.72	7.69	7.72	----
UV254 (absorbance) /cm	0.051	0.027	47.1%	0.029	----	45.1%	0.019	----		0.018	0.018	0.017	----
June 8, 2023													
TOC, mg/L	2.68	1.34	50.0%	1.13	57.8%	53.9%	1.21	54.9%	1.2	----	----	----	55.2%
DOC, mg/L	2.71	1.35	50.2%	1.17	56.8%	53.5%	1.22	55.0%	1.23	----	----	----	54.6%
pH for UV254, S.U.	8.03	7.59	----	7.68	----	----	7.66	----	8.03	7.71	7.74	7.76	----
UV254 (absorbance) /cm	0.049	0.024	51.0%	0.021	----	54.1%	0.018	----	0.049	0.016	0.016	0.016	----

Note 1: Avg. values of combined GSF #1, #2, and #3 effluent were used to calculate removal efficiency.

1.2.6 Total Dissolved Solids (TDS) and Specific Conductance:

The GSF influent water contains moderately low TDS, 107 and 113 mg/L, consistent with the historic source water TDS range of 74 to 162 mg/L and a finished water range of 54 to 168 mg/L. The TDS principally consists of alkalinity (80 mg/L, as $CaCO_3$), calcium (≈ 21 mg/L) and chloride (≈ 12 mg/L), with lesser quantities of magnesium (≈ 9 mg/L), sodium (≈7.6 mg/L) and potassium (≈ 0.5 mg/L). All other inorganic constituents are non-detectable or at trace concentrations in the water. The GSF influent water demonstrates consistent specific conductance of 221 umhos/cm, with a conductivity-to-TDS ratio of 1.84 and 2.26 respectively. The GSF influent TDS of Q3 pilot plant program is less than the Q1 (September, 2022) TDS of 133-153 mg/L, and similar to the Q2 (January, 2023) TDS of 103-112 mg/L.

Table 1-7
Conductivity and TDS Monitoring Results– GSF Influent and Effluent

	GSF Influent	GSF Eff	GSF Influent	GSF Eff
Sampling Date	6/1/2023		6/8/2023	
Conductivity at 25 C, UMHOS/CM	221	221	221	221
Total Dissolved Solid (TDS), mg/L	107	98	113	120
Conductivity-to-TDS ratio	2.07	2.26	1.96	1.84

1.2.7 Alkalinity:

Alkalinity of GSF influent is consistently present at 80 mg/L (as $CaCO_3$). Based on the pH of 7.57 to 7.63 S.U. the alkalinity is ≈ 99% in the bicarbonate (HCO_3) form and represents approximately 94% of the total inorganic carbon in the water, with the balance present as carbonic acid (H_2CO_3) or carbon dioxide (CO_2). The Q3 (May-June 2023) alkalinity concentration is at the similar level of Q2 (January 2023) in the range of 80-85 mg/L (as $CaCO_3$), and consistently lower than what was demonstrated during Q1 (September 2022) at ≈ 90 mg/L (as $CaCO_3$).

1.2.8 Total Iron:

The GSF influent and effluent water demonstrates (Table 1-8) non-detectable (<0.050 mg/L) total iron in all samples, consistent with expectations because the raw water also demonstrated non-detectable iron in all samples.

Table 1-8
Raw Water, Slow Sand Filter (SSF) Effluent, GSF Influent and Effluent Fe Monitoring

Sample Date	Source Water	Slow Sand Filter Effluent		GSF Influent	Greensand Filter Effluent		
		SSF #1	SSF #2		GSF #1	GSF #2	GSF #3
5/30/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500
5/31/2023	----	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
6/1/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500

6/2/2023	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
6/4/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500
6/5/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500
6/6/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500
6/7/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500
6/8/2023	----	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
6/9/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500
6/10/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500
6/11/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500
6/12/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500
6/13/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500
6/14/2023	----	----	----	<0.0500	<0.0500	<0.0500	<0.0500

1.2.9 Total & Dissolved Manganese:

Manganese was monitored in the raw source (Long Pond) on June 2, 2023 with trace concentrations detected at 0.0292 mg/L (total) and 0.00312 mg/L (dissolved), below the USEPA SMCL (0.05 mg/L). The GSF influent water samples demonstrated total manganese at non-detectable (<0.00204 mg/L) to 0.0121 mg/L, averaging 0.0066 mg/L, indicating that some manganese in the raw water was captured within the Slow Sand Filters upstream of the greensand filters. The substantial majority (42 of 45 samples) of the GSF effluent demonstrated non-detectable manganese (<0.00204 mg/L) with only three (3) effluent samples containing trace amounts of manganese at concentration in the range of 0.00255-0.0029 mg/L, barely above the detection limit.

Table 1-9
Raw Water, Slow Sand Filter (SSF) Effluent,
GSF Influent and Effluent Mn Monitoring

Sampling Date, Parameter	Source Water	Slow Sand Filter Effluent			GSF Influent	Greensand Filter Effluent		
		SSF #1		SSF #2		GSF #1	GSF #2	GSF #3
5/30/2023	**Total**	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204
	Dissolved	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204
5/31/2023	**Total**	----	0.00217	<0.00204	<0.00204	<0.00204	<0.00204	<0.00204
	Dissolved	----	0.0021	<0.00204	<0.00204	<0.00204	<0.00204	<0.00204
6/1/2023	**Total**	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204
	Dissolved	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204
6/2/2023	**Total**	0.0292	0.0047	<0.00204	0.00799	<0.00204	<0.00204	<0.00204
	Dissolved	0.00312	0.00431	<0.00204	<0.00204	<0.00204	<0.00204	<0.00204
6/4/2023	**Total**	----	----	----	0.0121	**0.00255**	<0.00204	<0.00204
	Dissolved	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204
6/5/2023	**Total**	----	----	----	0.011	<0.00204	<0.00204	**0.00262**

	Dissolved	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204
6/6/2023	**Total**	----	----	----	0.0103	<0.00204	<0.00204	<0.00204
	Dissolved	----	----	----	0.00383	<0.00204	<0.00204	<0.00204
6/7/2023	**Total**	----	----	----	0.0102	<0.00204	**0.0029**	<0.00204
	Dissolved	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204
6/8/2023	**Total**	----	0.0151	<0.00204	0.00889	<0.00201	<0.00201	<0.00201
	Dissolved	----	0.0143	<0.00204	<0.00204	<0.00204	<0.00204	<0.00204
6/9/2023	**Total**	----	----	----	0.00829	<0.00204	<0.00204	<0.00204
	Dissolved	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204
6/10/2023	**Total**	----	----	----	0.00703	<0.00204	<0.00204	<0.00204
	Dissolved	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204
6/11/2023	**Total**	----	----	----	0.0074	<0.00204	<0.00204	<0.00204
	Dissolved	----	----	----	0.00283	<0.00204	<0.00204	<0.00204
6/12/2023	**Total**	----	----	----	0.00672	<0.00204	<0.00204	<0.00204
	Dissolved	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204
6/13/2023	**Total**	----	----	----	0.00613	<0.00204	<0.00204	<0.00204
	Dissolved	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204
6/14/2023	**Total**	----	----	----	0.00361	<0.00204	<0.00204	<0.00204
	Dissolved	----	----	----	<0.00204	<0.00204	<0.00204	<0.00204

1.2.10 Copper, Lead and Zinc:

Copper (0.0108 mg/L and 0.0098 mg/L) and zinc (0.0159 mg/L and 0.0456 mg/L) were present at trace concentrations in the GSF influent. Similar trace concentrations of copper and zinc were detected in Q1 (September 2022) and Q2 (January 2023) pilot plant monitoring, with copper (0.0103 to 0.0146 mg/L) and zinc (0.0184 to 0.0253 mg/L) in Q1 and copper (0.0072 & 0.0075 mg/L) and zinc (0.00862 & 0.00992 mg/L) in Q2. The copper and zinc are believed to be sourced from wetted materials of construction in the treatment facility.

Lead was consistently non-detectable (<0.0010 mg/L) in all samples, similar to the Q1 and Q2 pilot plant programs.

1.2.11 Total Hardness:

The GSF influent demonstrated moderately elevated total hardness (as $CaCO_3$) of 91.5 and 89.6 mg/L, which is comprised of calcium (54 to 52.5 mg/L, as $CaCO_3$) and magnesium (37.5 to 37.1 mg/L, as $CaCO_3$). The results were comparable to the monitoring results of Q1 (September 2022) of 93 to 98 mg/L (as $CaCO_3$) and Q2 (January 2023) of 95.8 and 89.1 mg/L (as $CaCO_3$).

1.3 Hydraulic Loading

The valves of the GSF system are positioned to operate the filters at different nominal flowrates of 2 gpm, 3 gpm and 4 gpm, to allow an assessment of the impact of different hydraulic loading rates upon performance. The operating cycle for each filter was initially programmed at 20,000 gallons and the cycle duration was adjusted to 35,000 – 40,000 gallons based upon observations.

Table 1-10 presents a summary of GSF influent flowrate of the pilot plant operation from the operating logs. Over the duration of the pilot plant program each filter unit was able to sustain operating flowrates and hydraulic loading in very close proximity to the target values. The individual filter vessels demonstrated the following:

- GSF#1 demonstrated a hydraulic loading of 1.9 gpm consistently;
- GSF#2 demonstrated a hydraulic loading of 3 to 3.1 gpm, averaging 3.06 gpm;
- GSF#3 demonstrated a hydraulic loading of 3.8 to 4.1 gpm, averaging 3.95 gpm.

Table 1-10
GSF Influent Flowrate (gpm) Monitoring Results

DATE	**5/30/2023**																	
GSF	**GSF1**						**GSF2**						**GSF3**					
TIME	8:00	9:45	11:35	13:30	17:45	20:00	8:00	9:45	11:35	13:30	17:45	20:00	8:00	9:45	11:35	13:30	17:45	20:00
Flowrate	1.9	1.9	1.9	1.9	1.9	1.9		3.0	3.0	3.1	3.0	3.0		4.1	4.1	4.1	4.1	4.0
DATE	**5/31/2023**																	
GSF	**GSF1**						**GSF2**						**GSF3**					
TIME	7:30	9:30	11:15	17:10			7:30	9:30	11:15	17:10			7:30	9:30	11:15	17:10		
Flowrate	1.9	1.9	1.9	1.9			3.0	3.0	3.1	3.1			4.1	4.1	4.1	4.1		
DATE	**6/1/2023**																	
GSF	**GSF1**						**GSF2**						**GSF3**					
TIME	7:15	12:30	13:30	17:00	19:10		7:15	12:30	13:30	17:00	19:10		7:15	12:30	13:30	17:00	19:10	
Flowrate	1.9	1.9	1.9	1.9	1.9		3.1	3.1	3.1	3.1	3.0		4.1	4.1	4.1	4.1	4.1	
DATE	**6/2/2023**																	
GSF	**GSF1**						**GSF2**						**GSF3**					
TIME	6:30	7:30	8:30	9:00			6:30	7:30	8:30	9:00			6:30	7:30	8:30	9:00		
Flowrate	1.9	1.9	1.9	1.9			3.0	3.0	3.0	3.0			4.1	4.1	4.1	4.1		
DATE	**6/4/2023**																	
GSF	**GSF1**						**GSF2**						**GSF3**					
TIME	15:30	16:30					15:30	16:30					15:30	16:30				
Flowrate	1.9	1.9					3.1	3.0					4.0	4.0				
DATE	**6/5/2023**																	
GSF	**GSF1**						**GSF2**						**GSF3**					
TIME	6:45	9:00	12:25	18:15			6:45	9:00	12:25	18:15			6:45	9:00	12:25	18:15		
Flowrate	1.9	1.9	1.9	1.9			3.1	3.0	3.1	3.0			3.8	3.9	3.9	3.9		
DATE	**6/6/2023**																	
GSF	**GSF1**						**GSF2**						**GSF3**					
TIME	7:10	8:00	9:00	10:05	16:20		7:10	8:00	9:00	10:05	16:20		7:10	8:00	9:00	10:05	16:20	

Flowrate	1.9	1.9	1.9	1.9	1.9	3.1	3.0	3.1	3.1	3	3.9	3.9	3.9	3.9	3.9
DATE	**6/7/2023**														
GSF	**GSF1**					**GSF2**					**GSF3**				
TIME	7:00	8:00	10:45	13:10	16:45	7:00	8:00	10:45	13:10	16:45	7:00	8:00	10:45	13:10	16:45
Flowrate	1.9	1.9	1.9	1.9	1.9	3.1	3.0	3.1	3.1	3.0	3.9	3.9	3.9	3.9	3.9
DATE	**6/8/2023**														
GSF	**GSF1**					**GSF2**					**GSF3**				
TIME	6:40	9:00	12:00	14:30	16:30	6:40	9:00	12:00	14:30	16:30	6:40	9:00	12:00	14:30	16:30
Flowrate	1.9	1.9	1.9	1.9	1.9	3.1	3.1	3.1	3.0	3.1	3.9	3.9	3.9	3.9	3.9
DATE	**6/9/2023**														
GSF	**GSF1**					**GSF2**					**GSF3**				
TIME	6:50	8:10	11:30	14:00	16:00	6:50	8:10	11:30	14:00	16:00	6:50	8:10	11:30	14:00	16:00
Flowrate	1.9	1.9	1.9	1.9	1.9	3.1	3.0	3.0	3.0	3.0	3.9	3.9	3.9	3.9	3.8
DATE	**6/10/2023**														
GSF	**GSF1**					**GSF2**					**GSF3**				
TIME	7:00	9:00	11:30	14:00	16:00	7:00	9:00	11:30	14:00	16:00	7:00	9:00	11:30	14:00	16:00
Flowrate	1.9	1.9	1.9	1.9	1.9	3.1	3.1	3.0	3.1	3.1	3.9	3.9	3.8	3.8	3.9
DATE	**6/11/2023**														
GSF	**GSF1**					**GSF2**					**GSF3**				
TIME	7:00	9:30	12:00	14:00	16:00	7:00	9:30	12:00	14:00	16:00	7:00	9:30	12:00	14:00	16:00
Flowrate	1.9	1.9	1.9	1.9	1.9	3.1	3.1	3.1	3.1	3.1	3.8	3.8	3.8	3.8	3.9
DATE	**6/12/2023**														
GSF	**GSF1**					**GSF2**					**GSF3**				
TIME	6:45	10:00	12:30	14:00	16:30	6:45	10:00	12:30	14:00	16:30	6:45	10:00	12:30	14:00	16:30
Flowrate	1.9	1.9	1.9	1.9	1.9	3.0	3.1	3.1	3.1	3.0	3.8	3.9	3.9	3.9	4.0
DATE	**6/13/2023**														
GSF	**GSF1**					**GSF2**					**GSF3**				
TIME	7:00	8:00	10:00	12:30	15:45	7:00	8:00	10:00	12:30	15:45	7:00	8:00	10:00	12:30	15:45
Flowrate	1.9	1.9	1.9	1.9	1.9	3.0	3.0	3.1	3.1	3.1	3.9	3.9	3.9	4.0	4.0
DATE	**6/14/2023**														
GSF	**GSF1**					**GSF2**					**GSF3**				
TIME	6:30					6:30					6:30				
Flowrate	1.9					3.1					4.0				
Average	1.9					3.06					3.95				

1.4 Pilot Plant Performance Evaluation - Manganese and Iron Removal

The GSF influent water samples demonstrated total manganese ranging from non-detectable (<0.00204 mg/L) to 0.0121 mg/L, averaging 0.0066 mg/L. forty-two (42) of forty-five (45) GSF effluent samples demonstrated non-detectable manganese (<0.00204 mg/L) with three (3) effluent samples containing trace amounts of manganese (total) at concentrations in the range of 0.00255-0.0029 mg/L. In summary, the greensand filtration system demonstrated consistent and effective removal of manganese at all hydraulic loading rates.

1.5 Chlorine Pre-Oxidant Dosage

The free chlorine residual in the greensand filter influent is continuously monitored by the on-line instrumentation (Segment 1 – chlorine contact chamber effluent), augmented by periodic field monitoring by the pilot plant operator. The free chlorine residual in the greensand effluent was

field monitored by the pilot plant operator. The differential between the GSF influent and effluent chlorine residual was calculated as the total filter chlorine demand (Tables 1-11, Figures 1-1 to 1-4). In addition to soluble manganese, chlorine demand can include oxidizable organics and other materials in the feedwater and the demand to maintain the catalytic oxidation of the greensand media. GSF#1 demonstrated a slightly higher average free chlorine demand of 0.20 mg/L, with GSF#2 demonstrating an average fee chlorine demand of 0.15 mg/L and GSF#3 an average free chlorine demand of 0.14 mg/L.

Table 1-11
GSF Free Chlorine Demand Monitoring (mg/L)

Date/Time	GSFs Influent, Cl Residual	GSF#1		GSF#2		GSF#3	
		Effluent, Cl Residual	Chlorine Demand	Effluent, Cl Residual	Chlorine Demand	Effluent, Cl Residual	Chlorine Demand
5/30/2023 08:00	1.04	0.78	0.26	0.74	0.3	----	----
5/30/2023 09:45	1.01	0.81	0.2	0.83	0.18	0.78	0.23
5/30/2023 11:35	0.99	0.82	0.17	0.91	0.08	0.88	0.11
5/30/2023 13:30	1.14	0.91	0.23	0.92	0.22	0.89	0.25
5/30/2023 17:45	1.15	0.97	0.18	0.95	0.2	0.92	0.23
5/30/2023 20:00	1.27	1.18	0.09	1.1	0.17	1.12	0.15
5/31/2023 07:30	1.35	0.99	0.36	1.01	0.34	0.99	0.36
5/31/2023 09:30	1.34	1.11	0.23	1.08	0.26	1.1	0.24
5/31/2023 11:15	1.33	1.08	0.25	1.12	0.21	1.15	0.18
5/31/2023 17:10	1.38	1.15	0.23	1.18	0.2	1.19	0.19
6/1/2023 07:15	1.5	1.45	0.05	1.47	0.03	1.5	0
6/1/2023 12:30	1.46	1.39	0.07	1.39	0.07	1.41	0.05
6/1/2023 13:30	1.44	1.4	0.04	1.42	0.02	1.39	0.05
6/1/2023 17:00	1.39	1.32	0.07	1.31	0.08	1.37	0.02
6/1/2023 19:10	1.37	1.32	0.05	1.3	0.07	1.31	0.06
6/2/2023 06:30	1.27	1.25	0.02	1.19	0.08	1.22	0.05
6/2/2023 07:30	1.27	1.22	0.05	1.25	0.02	1.2	0.07
6/2/2023 08:30	1.27	1.18	0.09	1.24	0.03	1.25	0.02
6/2/2023 09:00	1.35	1.19	0.16	1.22	0.13	1.25	0.1
6/4/2023 15:30	1.35	1.1	0.25	1.18	0.17	1.15	0.2
6/4/2023 16:30	1.35	1.12	0.23	1.21	0.14	1.18	0.17
6/5/2023 06:45	1.4	1.19	0.21	1.19	0.21	1.2	0.2
6/5/2023 09:00	1.44	1.22	0.22	1.18	0.26	1.2	0.24
6/5/2023 12:25	1.7	1.5	0.2	1.5	0.2	1.5	0.2
6/5/2023 18:15	1.75	1.53	0.22	1.55	0.2	1.56	0.19
6/6/2023 07:10	1.77	1.56	0.21	1.52	0.25	1.55	0.22
6/6/2023 08:00	1.75	1.54	0.21	1.58	0.17	1.65	0.1
6/6/2023 09:00	1.75	1.58	0.17	1.56	0.19	1.69	0.06
6/6/2023 10:05	1.77	1.6	0.17	1.6	0.17	1.63	0.14
6/6/2023 16:20	1.78	1.61	0.17	1.61	0.17	1.59	0.19

6/7/2023 07:00	1.51	1.44	0.07	1.42	0.09	1.39	0.12
6/7/2023 08:00	1.53	1.42	0.11	1.44	0.09	1.44	0.09
6/7/2023 10:45	1.54	1.39	0.15	1.41	0.13	1.35	0.19
6/7/2023 13:10	1.55	1.38	0.17	1.38	0.17	1.45	0.1
6/7/2023 16:45	1.58	1.33	0.25	1.46	0.12	1.44	0.14
6/8/2023 06:40	1.62	1.24	0.38	1.5	0.12	1.42	0.2
6/8/2023 09:00	1.62	1.33	0.29	1.44	0.18	1.5	0.12
6/8/2023 12:00	1.61	1.37	0.24	1.48	0.13	1.47	0.14
6/8/2023 14:30	1.61	1.39	0.22	1.48	0.13	1.51	0.1
6/8/2023 16:30	1.61	1.38	0.23	1.5	0.11	1.48	0.13
6/9/2023 06:50	1.6	1.35	0.25	1.41	0.19	1.41	0.19
6/9/2023 08:10	1.61	1.27	0.34	1.45	0.16	1.38	0.23
6/9/2023 11:30	1.61	1.4	0.21	1.48	0.13	1.46	0.15
6/9/2023 14:00	1.65	1.41	0.24	1.53	0.12	1.52	0.13
6/9/2023 16:00	1.66	1.4	0.26	1.41	0.25	1.47	0.19
6/10/2023 07:00	1.63	1.31	0.32	1.4	0.23	1.36	0.27
6/10/2023 09:00	1.58	1.25	0.33	1.49	0.09	1.45	0.13
6/10/2023 11:30	1.52	1.34	0.18	1.39	0.13	1.52	0
6/10/2023 14:00	1.58	1.34	0.24	1.4	0.18	1.48	0.1
6/10/2023 16:00	1.47	1.35	0.12	1.42	0.05	1.44	0.03
6/11/2023 07:00	1.58	1.33	0.25	1.45	0.13	1.45	0.13
6/11/2023 09:30	1.58	1.37	0.21	1.48	0.1	1.48	0.1
6/11/2023 12:00	1.6	1.29	0.31	1.38	0.22	1.38	0.22
6/11/2023 14:00	1.5	1.35	0.15	1.42	0.08	1.42	0.08
6/11/2023 16:00	1.64	1.36	0.28	1.48	0.16	1.48	0.16
6/12/2023 06:45	1.61	1.35	0.26	1.38	0.23	1.41	0.2
6/12/2023 10:00	1.58	1.41	0.17	1.5	0.08	1.52	0.06
6/12/2023 12:30	1.58	1.39	0.19	1.46	0.12	1.51	0.07
6/12/2023 14:00	1.57	1.42	0.15	1.46	0.11	1.5	0.07
6/12/2023 16:30	1.55	1.37	0.18	1.45	0.1	1.45	0.1
6/13/2023 07:00	1.61	1.38	0.23	1.42	0.19	1.46	0.15
6/13/2023 08:00	1.6	1.28	0.32	1.46	0.14	1.44	0.16
6/13/2023 10:00	1.58	1.44	0.14	1.36	0.22	1.49	0.09
6/13/2023 12:30	1.54	1.31	0.23	1.41	0.13	1.47	0.07
6/13/2023 15:45	1.52	1.31	0.21	1.4	0.12	1.42	0.1
6/14/2023 06:30	1.47	1.22	0.25	1.32	0.15	1.34	0.13
Average	**1.50**	**1.30**	**0.20**	**1.35**	**0.15**	**1.37**	**0.14**

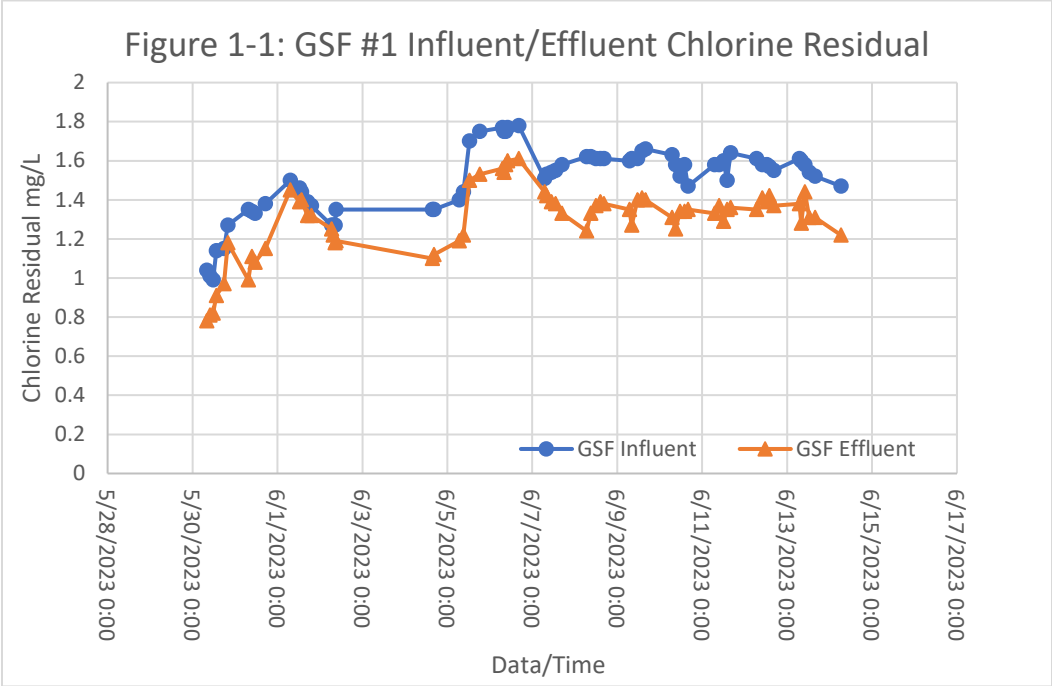


Figure 1-1: GSF #1 Influent/Effluent Chlorine Residual
Chlorine Residual mg/L
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
GSF Influent
GSF Effluent
5/28/2023 0:00
5/30/2023 0:00
6/1/2023 0:00
6/3/2023 0:00
6/5/2023 0:00
6/7/2023 0:00
6/9/2023 0:00
6/11/2023 0:00
6/13/2023 0:00
6/15/2023 0:00
6/17/2023 0:00
Data/Time

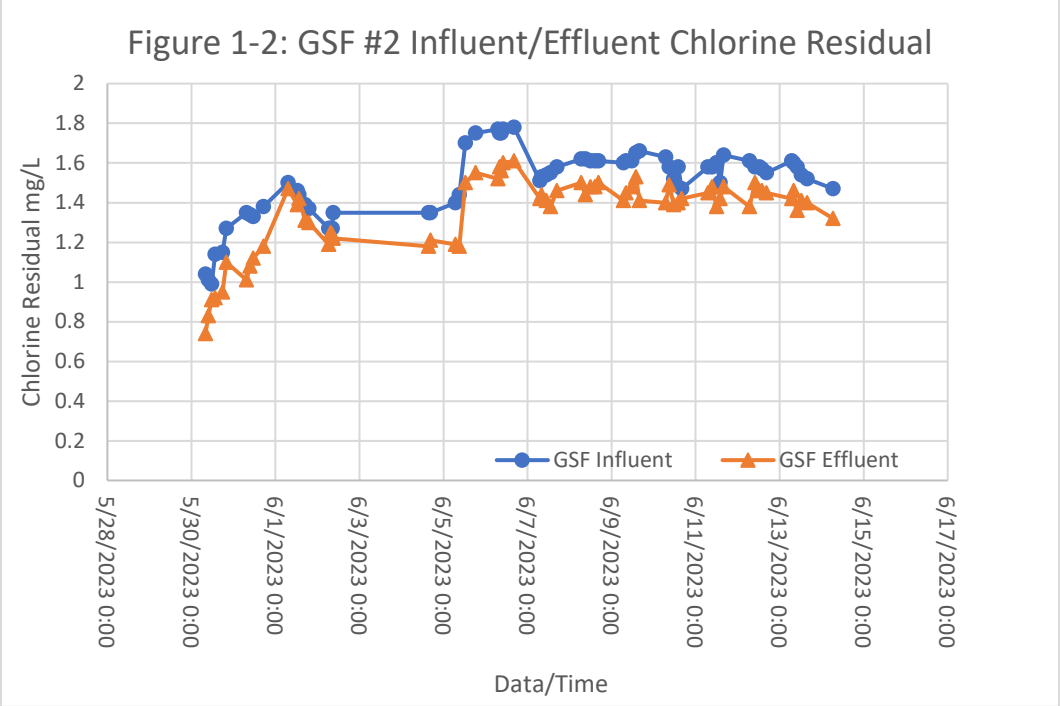


Figure 1-2: GSF #2 Influent/Effluent Chlorine Residual
Chlorine Residual mg/L
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
GSF Influent
GSF Effluent
5/28/2023 0:00
5/30/2023 0:00
6/1/2023 0:00
6/3/2023 0:00
6/5/2023 0:00
6/7/2023 0:00
6/9/2023 0:00
6/11/2023 0:00
6/13/2023 0:00
6/15/2023 0:00
6/17/2023 0:00
Data/Time

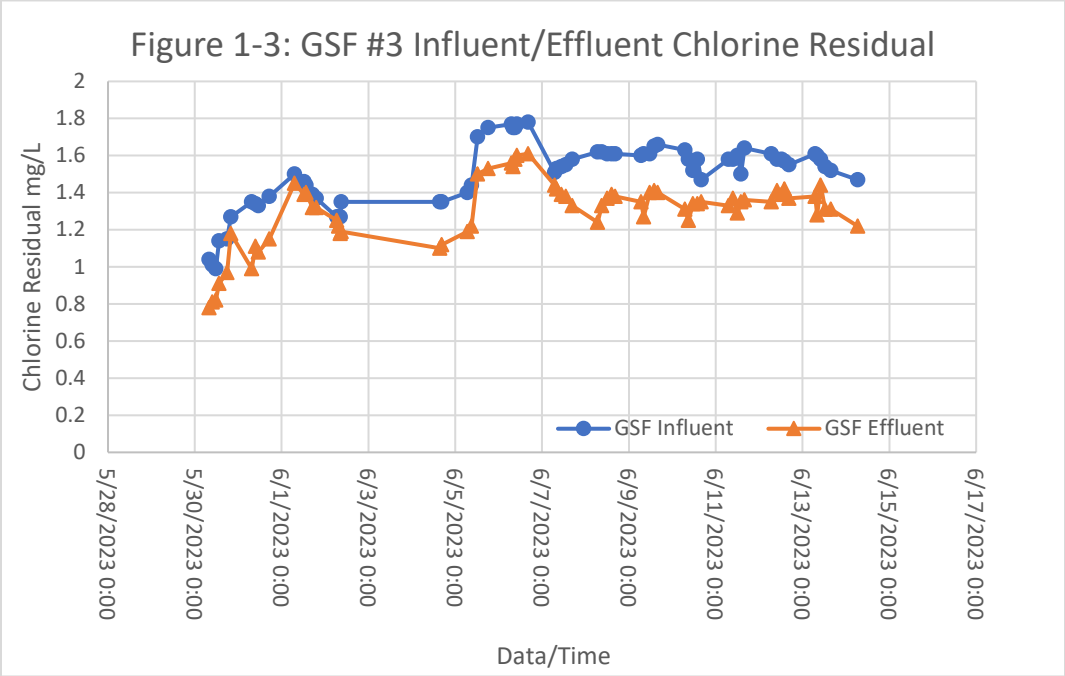


Figure 1-3: GSF #3 Influent/Effluent Chlorine Residual
Chlorine Residual mg/L
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
GSF Influent
GSF Effluent
5/28/2023 0:00
5/30/2023 0:00
6/1/2023 0:00
6/3/2023 0:00
6/5/2023 0:00
6/7/2023 0:00
6/9/2023 0:00
6/11/2023 0:00
6/13/2023 0:00
6/15/2023 0:00
6/17/2023 0:00
Data/Time

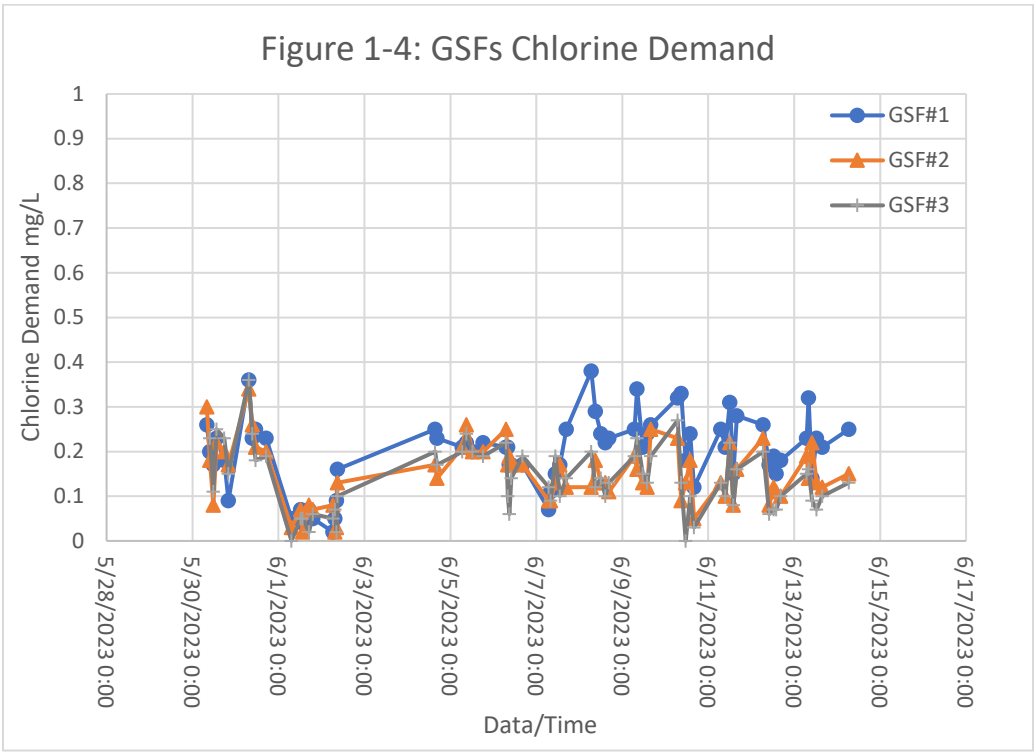


Figure 1-4: GSFs Chlorine Demand
Chlorine Demand mg/L
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
GSF#1
GSF#2
GSF#3
5/28/2023 0:00
5/30/2023 0:00
6/1/2023 0:00
6/3/2023 0:00
6/5/2023 0:00
6/7/2023 0:00
6/9/2023 0:00
6/11/2023 0:00
6/13/2023 0:00
6/15/2023 0:00
6/17/2023 0:00
Data/Time

1.6 Greensand Filter Backwash

All three (3) GSFs underwent a double sodium hypochlorite soak to re-condition and oxidize the greensand plus media, and then backwashed thoroughly prior to initiating the Q3 GSF pilot plant program. The operating cycle for each filter was initially programmed at 20,000 gallons, and then increased to 35,000-40,000 gallons. Each filter unit was backwashed upon completion of each operating cycle (Table 1-12).

The backwash utilized slow sand filter effluent supplied at a pressure of ≈36 psi using a backwash flowrate of 6 gpm, equivalent to a hydraulic loading of 11 gpm/ft^2. During each backwash cycle, samples of the spent backwash water were obtained at 2-minute intervals for the duration of the backwash event, followed by a 7-minute rinse at the same flowrate as the backwash flowrate. Tables 1-13 to 1-15 present summaries of the laboratory monitored TSS, turbidity, and manganese backwash monitoring data.

Table 1-12
Greensand Filter Operating Cycles

Greensand Filter #1:		
Operating Start Time	5/30/2023 08:00	
Backwash Date	6/11/2023	6/14/2023
Backwash Start Time	≈ 18:00	
Actual Operating Volume, gallons	35,000	7,072
Total Operating Vol., gallons	**42,072**	
Greensand Filter #2:		
Operating Start Time	5/30/2023 08:00	
Backwash Date	6/7/2023	6/14/2023
Backwash Start Time	07:00 -08:00	
Actual Operating Volume, gallons	35,630	31,420
Total Operating Vol., gallons	**67,050**	
Greensand Filter #3		
Operating Start Time	5/30/2023 08:00	
Backwash Date	6/5/2023	6/12/2023
Backwash Start Time	07:50	≈ 08:30
Actual Operating Volume, gallons	35,424	40,000
Total Operating Vol., gallons	**75,424**	

1.6.1 Spent Backwash Water – Total Suspended Solids (TSS):

Each backwash cycle demonstrated an initially elevated TSS content in the first 2 minutes of operation (Figure 1-5), followed by the majority of the TSS flushed out in the initial 2-4 minutes, and demonstrated an extended backwash "tail" with a very low TSS concentration (< 10 ppm) after 8 minutes of backwash. Comparatively, the Q1 pilot plant program with a much higher GSF influent total manganese content (average 0.19 mg/L; range = 0.075 - 0.306 mg/L) demonstrated

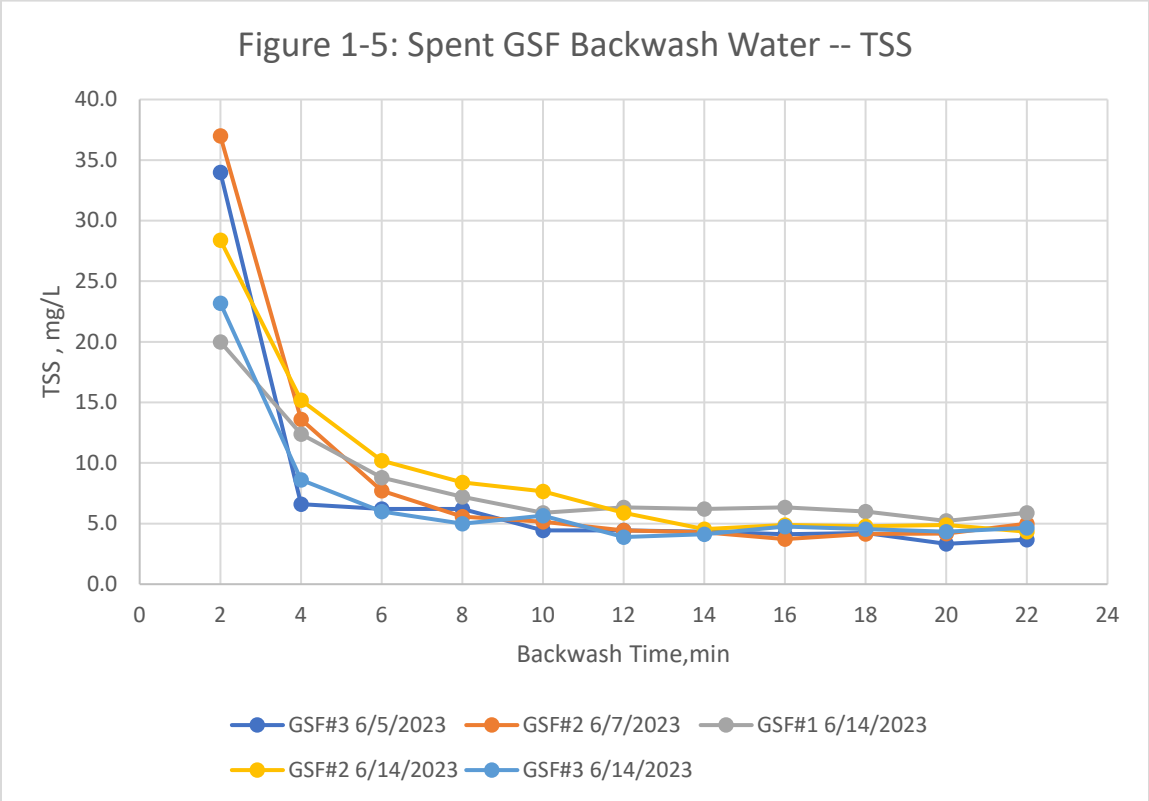
spent backwash TSS concentrations in the range of 10-54 mg/L after 8-minutes of backwash, and at minimum 18 - 22 minutes to reduce the spent backwash TSS to approximately 10 mg/L.

1.6.2 Spent Backwash Water - Turbidity:

Illustrated in Figure 1-6, the spent backwash water demonstrated a more elongated duration of elevated turbidity, up to 6 minutes. Four (4) of the five (5) backwash events demonstrated approximately 41-53 % turbidity reduction after 6 minutes, then have an additional ≈15% turbidity reduction after 12 minutes. After 12 minutes there was not further effective turbidity reduction achieved by backwashing, with the final spent backwash turbidity in the range of 20-30 NTU. The backwash event of GSF#1 on June 14, 2023 could only reduce the spent backwash turbidity to 40.5 NTU after 22 minutes backwash duration.

1.6.3 Spent Backwash Water – Total Manganese:

Illustrated in Figure 1-7, the majority of manganese was flushed out of the filter media bed within 4 to 6 minutes of backwash initiation. All five (5) backwash events demonstrated spent backwash with low level of manganese below 2 mg/L after 8-10 minutes of backwash duration.



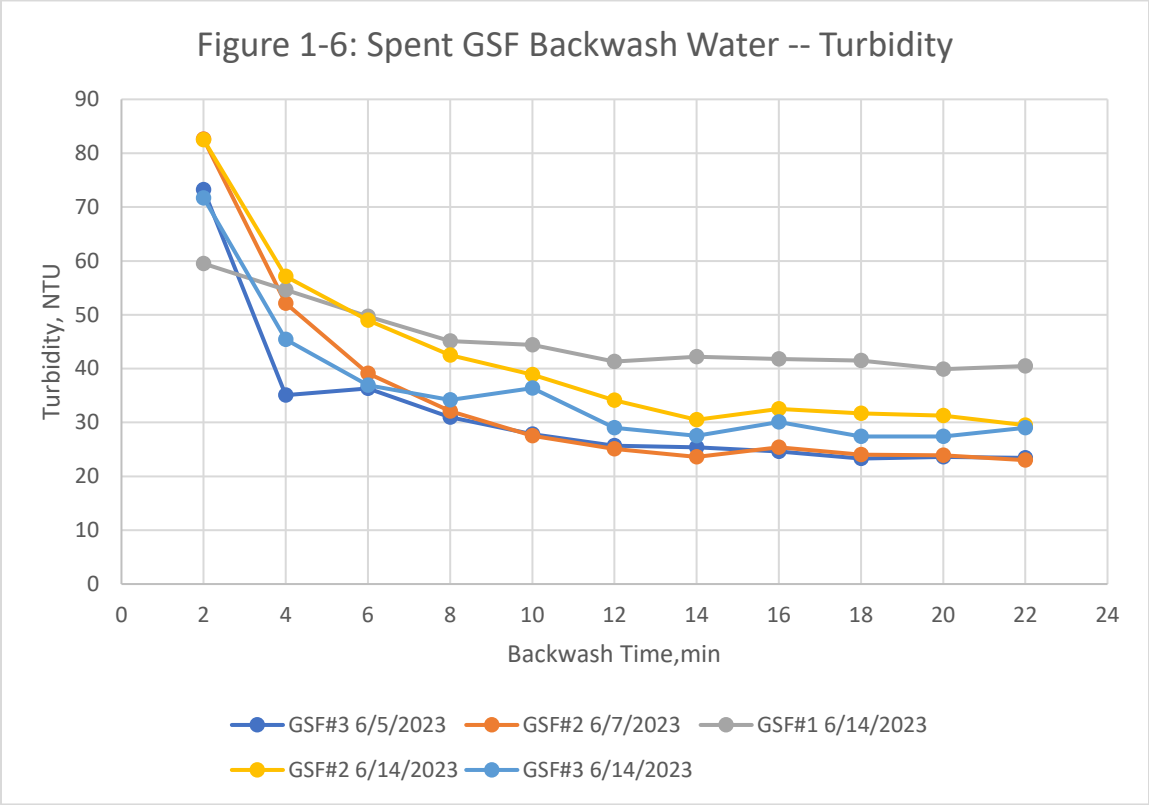


Figure 1-6: Spent GSF Backwash Water -- Turbidity
Turbidity, NTU
0
10
20
30
40
50
60
70
80
90
0
2
4
6
8
10
12
14
16
18
20
22
24
Backwash Time,min
GSF#3 6/5/2023
GSF#2 6/7/2023
GSF#1 6/14/2023
GSF#2 6/14/2023
GSF#3 6/14/2023

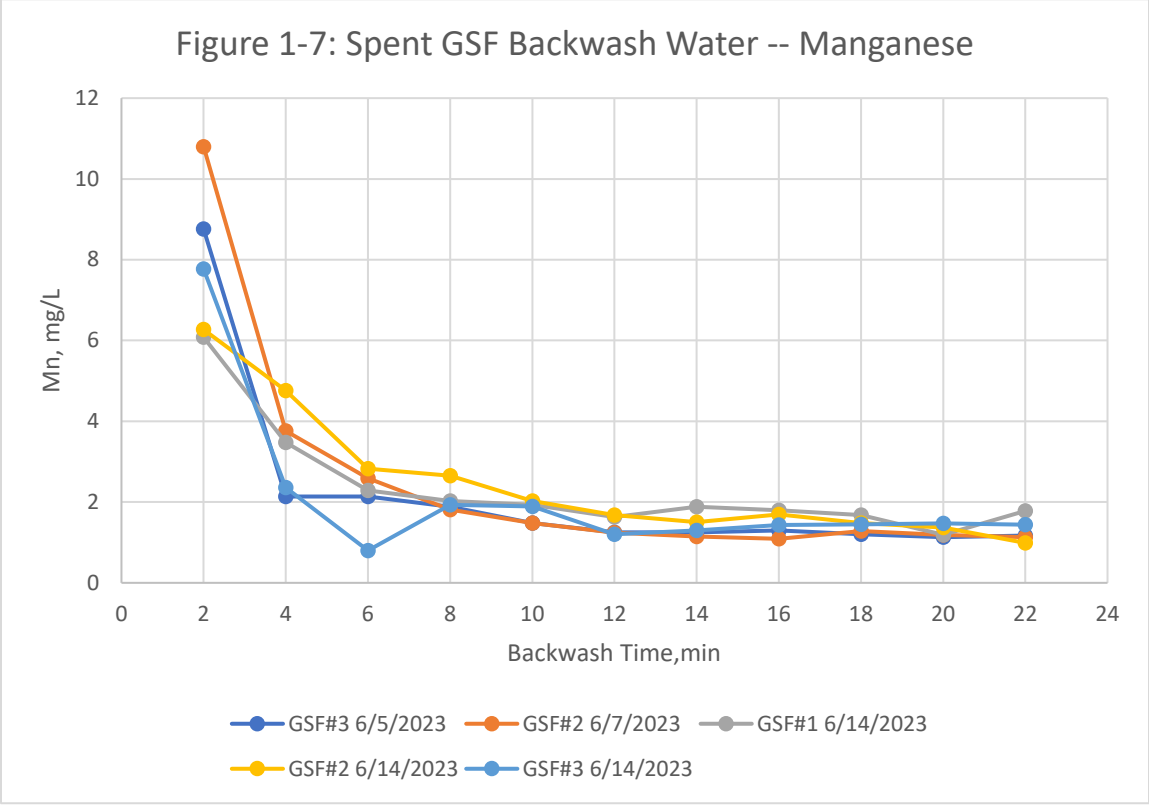


Figure 1-7: Spent GSF Backwash Water -- Manganese
Mn, mg/L
0
2
4
6
8
10
12
0
2
4
6
8
10
12
14
16
18
20
22
24
Backwash Time,min
GSF#3 6/5/2023
GSF#2 6/7/2023
GSF#1 6/14/2023
GSF#2 6/14/2023
GSF#3 6/14/2023

Table 1-13
Greensand Filters -- Summary of Spent Backwash Water Monitoring

Backwash Events	Backwash Duration -- Minutes										
	2	4	6	8	10	12	14	16	18	20	22
GSF#1, 6/11/2023	No Data Available										
GSF#1, 6/14/2023											
Total Suspended Solids (TSS), mg/L	20	12.4	8.80	7.2	5.88	6.33	6.22	6.33	6.00	5.22	5.88
Turbidity, NTU	59.5	54.6	49.7	45.1	44.4	41.3	42.2	41.8	41.5	39.9	40.5
Mn, total, mg/L	6.08	3.48	2.29	2.03	1.93	1.63	1.88	1.8	1.68	1.19	1.78
GSF#2, 6/7/2023											
Total Suspended Solids (TSS), mg/L	37	13.6	7.72	5.58	5.15	4.43	4.29	3.72	4.15	<4.18	<5.00
Turbidity, NTU	82.6	52.1	39.1	32.1	27.5	25.1	23.6	25.4	24.0	23.9	23
Mn, total, mg/L	10.8	3.76	2.59	1.810	1.48	1.24	1.15	1.09	1.28	1.19	1.13
GSF#2, 6/14/2023											
Total Suspended Solids (TSS), mg/L	28.4	15.2	10.20	8.40	7.66	5.88	4.55	4.88	4.77	4.88	4.33
Turbidity, NTU	82.5	57.1	49.0	42.5	38.9	34.1	30.5	32.5	31.7	31.3	29.5
Mn, total, mg/L	6.27	4.76	2.83	2.65	2.03	1.68	1.5	1.69	1.48	1.37	0.988
GSF#3, 6/5/2023											
Total Suspended Solids (TSS), mg/L	34.0	6.60	6.20	6.22	4.44	4.44	4.33	4.11	4.22	3.33	3.66
Turbidity, NTU	73.2	35.1	36.3	31.0	27.8	25.7	25.4	24.6	23.3	23.6	23.4
Mn, total, mg/L	8.76	2.14	2.14	1.88	1.48	1.25	1.25	1.30	1.20	1.13	1.17
GSF#3, 6/14/2023											
Total Suspended Solids (TSS), mg/L	23.2	8.60	6.00	5.00	5.66	3.89	4.11	4.75	4.55	4.33	4.66
Turbidity, NTU	71.7	45.4	36.9	34.2	36.4	29.0	27.5	30.1	27.4	27.4	29.0
Mn, total, mg/L	7.77	2.36	0.800	1.93	1.89	1.20	1.30	1.43	1.45	1.47	1.44

1.7 Disinfection By-Products (DBPs)

Two (2) rounds of Total Trihalomethane (TTHMs) and Haloacetic Acids (HAA5s) monitoring were conducted over the duration of the Q3 pilot plant program, including the GSF influent and effluent. The findings of this analytical investigation include the following:

- Two (2) rounds of upstream DBPs monitoring determined non-detectable TTHMSs (<0.500 µg/L) and HAA5s (<1.00 µg/L) in the SSF #1 and #2 effluent, upstream of the Segment 1 chlorination process. This is consistent with expectations.

- The greensand filter influent demonstrated TTHM with concentrations at 22.4 and 23.3 µg/L, reasonably consistent with the range of 15.9 to 31.3 µg/L demonstrated in Q2 pilot plant program (January 2023), and much lower than demonstrated in the Q1 (September 2022) pilot plant program (39.8 ug/L to 63.5 ug/L). The results are below the USEPA LRAA limit of 80 µg/L. The two (2) rounds of Q3 GSF effluent monitoring indicated a slight decrease of TTHM concentrations to 18.1 and 22.8 µg/L, indicating the greensand filters had no adverse impact upon TTHM formation, consistent with the Q1 and Q2 pilot plant findings.

- A single monitoring event demonstrated the greensand filter influent having a HAA5 concentration of 17.3 µg/L, somewhat lower than demonstrated in Q2 pilot plant program (23.3 to 32.5 µg/L), and much lower than demonstrated in the Q1 (September 2022) pilot plant program (60.6 ug/L and 70.4 ug/L). the Q3 results are below the USEPA LRAA limit of 60 µg/L. The GSF effluent monitoring indicated slight fluctuations of HAA5 concentration (18.5 and 17.0 µg/L), but determined to have no significant impact on HAA5 formation across the greensand filters.

Table 1-14
Disinfection By-Products (DBPs) Monitoring Results

	SSF #1 Eff	SSF #2 Eff	GSF Influent*	GSF Eff
Sampling Date	6/1/2023			
TTHMs, µg/L	**<0.500**	**<0.500**	**22.4**	**18.1***
HAA5s, µg/L	**<1.00**	**<1.00**	**17.3**	**18.5***
Sampling Date	6/8/2023			
TTHMs, µg/L	**<0.500**	**<0.500**	**23.3**	**22.8***
HAA5s, µg/L	**<1.00**	**<1.00**	**n/a**	**17.0***
***Composite samples: 1/3 from each GSF**				

II. PILOT PLANT RESULTS AND EVALUATION

1. The Long Pond source water demonstrated very low total manganese, with a portion removed in the Slow Sand Filters. As a result, the Greensand Filter influent demonstrated manganese in the range of non-detectable (<0.00204 mg/L) to 0.0121 mg/L, during the Q3 pilot plant program (May 30, 2023 – June 14, 2023). Forty-two (42) of forty-five (45) GSF effluent samples demonstrated effective manganese removal with non-detectable (<0.00204) total manganese. Only three (3) GSF effluent samples demonstrated trace total manganese (0.00222 to 0.0029 mg/L) during the Q3 pilot plant program.

2. The three (3) greensand filters were operated in parallel using sequential nominal hydraulic loading rates of 2 gpm, 3 gpm and 4 gpm, respectively. Over the duration of the pilot plant program GSF#1 demonstrated an average hydraulic loading of 1.9 gpm (3.5 gpm/ft^2); GSF#2 demonstrated an average hydraulic loading of 3.06 gpm (5.6 gpm/ft^2); and GSF#3 demonstrated an average hydraulic loading of 3.95 gpm (7.2 gpm/ft^2). This loading is comfortably within the operating range for Greensand Plus media (2 – 12 gpm/ft^2) and demonstrates the operational versatility of the filters.

3. The GSF influent demonstrated TTHM at 22.4 and 23.3 ug/L (avg. = 22.9 ug/L) compared to GSF effluent TTHM of 18.1 and 22.8 ug/L (avg. = 20.5 ug/L). The GSF influent demonstrated HAA5 at 17.3 ug/L compared to GSF effluent of 17 and 18.5 ug/L (avg. = 17.8 ug/L), in both cases indicating the GSF operation had no impact on DBPs formation.

4. The Slow Sand Filters demonstrated a TOC reduction of 50.0-57.9% across the filter beds. No significant removal of TOC occurred through the Greensand Filtration process.

5. Over the duration of the pilot plant program the Greensand Filters demonstrated low chlorine demand, with GSF#1 demonstrated an average free chlorine demand of 0.20 mg/L, GSF#2 demonstrated an average free chlorine demand of 0.15 mg/L, and GSF#3 an average free chlorine demand of 0.14 mg/L. This is consistent with the low oxidant demand due to non-detectable to trace level manganese in the GSF influent.

6. A filter backwash duration of 10-12 minutes (and in some cases 8 minutes) demonstrated effective backwash efficiency for flushing out manganese, TSS and turbidity. This is consistent with expectations, based upon the very low manganese and suspended solids loading to the filters. Good operating practice and the media manufacturer recommend using a minimum of 10-minute backwash duration.

APPENDIX A
PILOT PLANT DAILY LOG SHEETS

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												7:30 AM Backwash, 8:00 Start
DATE:5.30.23												
TIME		8:00	9:45	11:35	13:30	17:45	20:00					Filter Operating on 20,000K Interval
OPERATOR INITIALS:SM												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9	1.9	1.9					
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**		19756	19545	19331	18824	18571					
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36	36	36	36	36	36					
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												
Temperature – GSF Influent		16.6	17.1	17.5	17.7	17.7	17.7					average
Temperature – GSF Effluent		17	17	17	17	17	17					
Turbidity – GSF Influent		.086/.020	.086/.020	.086/.020	.070/.020	.086/.020	.079/.020					
Diss, Oxygen – GSF Influent		6.86	6.52									
Diss, Oxygen – GSF Effluent		5.97	5.78									
pH – GSF Influent		7.4	7.4	7.4	7.41	7.42	7.42					7.41
pH – GSF Effluent		7.41	7.4			7.4	7.4					7.40
TDS – GSF Influent		96	96									
TDS – GSF Effluent		95	93									
Sp. Cond. – GSF Influent		192	192									
Sp. Cond – GSF Effluent		190	186									
Cl Residual – GSF Influent		1.04	1.01	0.99	1.14	1.15	1.27					
Cl Residual – GSF Effluent		0.78	0.81	0.82	0.91	0.97	1.18					
Manganese – GSF Influent		ND	ND			ND						
Manganese – GSF Effluent		ND	ND			ND						
Iron – GSF Influent		ND	ND			ND						
Iron – GSF Effluent		ND	ND			ND						
Long Pond Fe		ND										
Long Pond Mn		0.34										
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date:5.30.2023												
TIME												
OPERATOR INITIALS:SM		8:00	9:45	11:35	13:30	17:45	20:00					
GSF Influent Flowrate	**gpm**		3	3	3.1	3	3					
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**		19766	19423	19081	18273	17867					
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**											
GSF Effluent Pressure	**psig**	36	36	36	36	36	36					
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		16.6	17.1	17.5	17.7	17.7	17.7					
Temperature – GSF Effluent		17	17	17	17	17	17					
Turbidity – GSF Influent		.086/.020	.086/.020	.086/.020	.070/.020	.086/.020	.079/.020					
Diss, Oxygen – GSF Influent		6.86	6.52									
Diss, Oxygen – GSF Effluent		6.12	5.84									
pH – GSF Influent		7.4	7.4	7.4	7.41	7.42	7.42					
pH – GSF Effluent		7.41	7.4			7.4	7.4					7.40
TDS – GSF Influent		96	96									
TDS – GSF Effluent		94	91									
Sp. Cond. – GSF Influent		192	192									
Sp. Cond – GSF Effluent		188	182									
Cl Residual – GSF Influent		1.04	1.01	0.99	1.14	1.15	1.27					
Cl Residual – GSF Effluent		0.74	0.83	0.91	0.92	0.95	1.1					
Manganese – GSF Influent		ND	ND			ND						
Manganese – GSF Effluent		ND	ND			ND						
Iron – GSF Influent		ND	ND			ND						
Iron – GSF Effluent		ND	ND			ND						
Long Pond Fe		ND										
Long Pond Mn		0.34										
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date:5.30.2023												
TIME												
OPERATOR INITIALS:SM			9:45	11:35	13:30	17:45	20:00					
GSF Influent Flowrate	**gpm**		4.1	4.1	4.1	4.1	4					
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**		19867	19373	18913	17831	17285					
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**											
GSF Effluent Pressure	**psig**	36	36	36	36	36	36					
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		16.6	17.1	17.5	17.7	17.7	17.7					
Temperature – GSF Effluent		17	17	17	17	17	17					
Turbidity – GSF Influent		.086/.020	.086/.020	.086/.020	.070/.020	.086/.020	.079/.020					
Diss, Oxygen – GSF Influent		6.86	6.52									
Diss, Oxygen – GSF Effluent			5.82									
pH – GSF Influent		7.4	7.4	7.4	7.41	7.42	7.42					
pH – GSF Effluent		7.41	7.4			7.4	7.4					7.40
TDS – GSF Influent		96	96									
TDS – GSF Effluent		95	93									
Sp. Cond. – GSF Influent		192	192									
Sp. Cond – GSF Effluent		190	186									
Cl Residual – GSF Influent		1.04	1.01	0.99	1.14	1.15	1.27					
Cl Residual – GSF Effluent			0.78	0.88	0.89	0.92	1.12					
Manganese – GSF Influent		ND	ND			ND						
Manganese – GSF Effluent		ND	ND			ND						
Iron – GSF Influent		ND	ND			ND						
Iron – GSF Effluent		ND	ND			ND						
Long Pond Fe		ND										
Long Pond Mn		0.34										
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE:5.31.23												
TIME		7:30	9:30	11:15	17:10							
OPERATOR INITIALS:SM												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9							
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	17248	16988	16790	16101							
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		17.8	17.9	18	18.1							
Temperature – GSF Effluent		17			17							
Turbidity – GSF Influent		.081/.020	.082/.020	.083/.020	.085/.020							
Diss, Oxygen – GSF Influent		5.41		4.69								
Diss, Oxygen – GSF Effluent		3.89		3.71								
pH – GSF Influent		7.43	7.42	7.42	7.41							7.42
pH – GSF Effluent		7.38		7.4								7.39
TDS – GSF Influent		85		89								
TDS – GSF Effluent		91		92								
Sp. Cond. – GSF Influent		170		178								
Sp. Cond – GSF Effluent		182		184								
Cl Residual – GSF Influent		1.35	1.34	1.33	1.38							
Cl Residual – GSF Effluent		0.99	1.11	1.08	1.15							
Manganese – GSF Influent		0.006		ND								
Manganese – GSF Effluent		ND		ND								
Iron – GSF Influent		ND		ND								
Iron – GSF Effluent		ND		ND								
Long Pond Fe		ND		ND								
Long Pond Mn		0.042		0.029								
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date:												
TIME		7:30	9:30	11:15	17:10							
OPERATOR INITIALS:												
GSF Influent Flowrate	**gpm**	3	3	3.1	3.1							
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	15760	15362	15029	13932							
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36	36	36	36							
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		17.8	17.9	18	18.1							
Temperature – GSF Effluent		17	0	18								
Turbidity – GSF Influent		.081/.020	.082/.020	.083/.020	.085/.020							
Diss, Oxygen – GSF Influent		5.41		4.69								
Diss, Oxygen – GSF Effluent		4.96		4.12								
pH – GSF Influent		7.43	7.42	7.42	7.41							
pH – GSF Effluent		7.38		7.4								7.39
TDS – GSF Influent		85		89								
TDS – GSF Effluent		91		91								
Sp. Cond. – GSF Influent		170		178								
Sp. Cond – GSF Effluent		182		182								
Cl Residual – GSF Influent		1.35	1.34	1.33	1.38							
Cl Residual – GSF Effluent		1.01	1.08	1.12	1.18							
Manganese – GSF Influent		0.006		ND								
Manganese – GSF Effluent		ND		ND								
Iron – GSF Influent		ND		ND								
Iron – GSF Effluent		ND		ND								
Long Pond Fe		ND		ND								
Long Pond Mn		0.042		0.029								
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date:												
TIME		7:30	9:30	11:15	17:10							
OPERATOR INITIALS:												
GSF Influent Flowrate	**gpm**	4.1	4.1	4.1	4.1							
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	14455	13923	13473	11991							
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36	36	36	36							
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		17.8	17.9	18	18.1							
Temperature – GSF Effluent		.081/.020	.082/.020	.083/.020	.085/.020							
Turbidity – GSF Influent		17	0	19								
Diss, Oxygen – GSF Influent		5.41		4.69								
Diss, Oxygen – GSF Effluent		5.41		4.08								
pH – GSF Influent		7.43	7.42	7.42	7.41							7.42
pH – GSF Effluent		7.4	7.4	7.4								7.4
TDS – GSF Influent		85		89								
TDS – GSF Effluent		91		90								
Sp. Cond. – GSF Influent		170		178								
Sp. Cond – GSF Effluent		182		180								
Cl Residual – GSF Influent		1.35	1.34	1.33	1.38							
Cl Residual – GSF Effluent		0.99	1.1	1.15	1.19							
Manganese – GSF Influent		0.006		ND								
Manganese – GSF Effluent		ND		ND								
Iron – GSF Influent		ND		ND								
Iron – GSF Effluent		ND		ND								
Long Pond Fe		ND		ND								
Long Pond Mn		0.042		0.029								
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE:6.1.23												
TIME		7:15	12:30	13:30	17:00	19:10						
OPERATOR INITIALS:SM												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9	1.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	14455	13834	13727	13322	13052						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.1	18.4	18.4	18.5	18.5						
Temperature – GSF Effluent		18	18	18	18	18						
Turbidity – GSF Influent		.079/.020	.078/.020	.079/.020	.078/.020	.078/.020						
Diss, Oxygen – GSF Influent		6.59	6.53	6.41	6.01							
Diss, Oxygen – GSF Effluent		3.29	4.59	4.89	5.27							
pH – GSF Influent		7.41	7.4	7.4	7.39	7.4						7.40
pH – GSF Effluent		7.4		7.4	7.4	7.4						7.4
TDS – GSF Influent		90		90		91						
TDS – GSF Effluent		91		91		89						
Sp. Cond. – GSF Influent		180		180		182						
Sp. Cond – GSF Effluent		181		182		178						
Cl Residual – GSF Influent		1.5	1.46	1.44	1.39	1.37						
Cl Residual – GSF Effluent		1.45	1.39	1.4	1.32	1.32						
Manganese – GSF Influent		ND		ND	ND	ND						
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.04		0.032								
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond Dissolved Oxygen		9		8.5								
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												Increase Backwash Interval 20,000-->35,000
Date:6.1.23												
TIME		7:15	12:30	13:30	17:00	19:10						
OPERATOR INITIALS:												
GSF Influent Flowrate	**gpm**	3.1	3.1	3.1	3.1	3						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	11312	10315	10149	9501	9073						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.1	18.4	18.4	18.5	18.5						
Temperature – GSF Effluent		18	18	18	18	18						
Turbidity – GSF Influent		.079/.020	.078/.020	.079/.020	.078/.020	.078/.020						
Diss, Oxygen – GSF Influent		6.59	6.53	6.41	6.01							
Diss, Oxygen – GSF Effluent		6.7	5.31	5.12	5.51							
pH – GSF Influent		7.41	7.4	7.4	7.39	7.4						
pH – GSF Effluent		7.4		7.4	7.4							7.4
TDS – GSF Influent		90		90		91						
TDS – GSF Effluent		91		94		93						
Sp. Cond. – GSF Influent		180		180		182						
Sp. Cond – GSF Effluent		182		188		186						
Cl Residual – GSF Influent		1.5	1.46	1.44	1.39	1.37						
Cl Residual – GSF Effluent		1.47	1.39	1.42	1.31	1.3						
Manganese – GSF Influent		ND		ND	ND	ND						
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.04		0.032								
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO		9		8.5								
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												Increase Backwash Interval 20,000-->40,000 (7:15 PM)
Date:6.1.23												
TIME		7:15	12:30	13:30	17:00	19:10						
OPERATOR INITIALS:												
GSF Influent Flowrate	**gpm**	4.1	4.1	4.1	4.1	4.1						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	8476	7137	6912	6045	5464						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.1	18.4	18.4	18.5	18.5						
Temperature – GSF Effluent		18	18	18	18							
Turbidity – GSF Influent		.079/.020	.078/.020	.079/.020	.078/.020	.078/.020						
Diss, Oxygen – GSF Influent		6.59	6.53	6.41	6.01							
Diss, Oxygen – GSF Effluent		5.98	5.17	5.94	5.42							
pH – GSF Influent		7.41	7.4	7.4	7.39	7.4						
pH – GSF Effluent		7.4		7.4	7.4	7.4						7.4
TDS – GSF Influent		90		90		91						
TDS – GSF Effluent		92		95		95						
Sp. Cond. – GSF Influent		180		180		182						
Sp. Cond – GSF Effluent		184		190		190						
Cl Residual – GSF Influent		1.5	1.46	1.44	1.39	1.37						
Cl Residual – GSF Effluent		1.5	1.41	1.39	1.37	1.31						
Manganese – GSF Influent		ND		ND	ND	ND						
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.04		0.032								
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO		9		8.5								
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE:6.2.23												
TIME		6:30	7:30	8:30	9:00							
OPERATOR INITIALS:SM												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9							
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	11715	11587	11493	11441							
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.8	18.9	18.9	18.9							
Temperature – GSF Effluent		18	18	18	18							
Turbidity – GSF Influent		.079/.020	.080/.020	.080/.020	.080/.020							
Diss, Oxygen – GSF Influent		6.73	6.18	6.56	6.42							
Diss, Oxygen – GSF Effluent		4.89	5.28	5.18	5							
pH – GSF Influent		7.34	7.39	7.39	7.37							7.37
pH – GSF Effluent		7.4		7.4	7.4							7.4
TDS – GSF Influent		90		90	89							
TDS – GSF Effluent		92		91	93							
Sp. Cond. – GSF Influent		180		180	178							
Sp. Cond – GSF Effluent		184		182	186							
Cl Residual – GSF Influent		1.27	1.27	1.27	1.35							
Cl Residual – GSF Effluent		1.25	1.22	1.18	1.19							
Manganese – GSF Influent		0.006		0.006	ND							
Manganese – GSF Effluent		ND		ND	ND							
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe		ND										
Long Pond Mn		0.032										
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond Dissolved Oxygen		7.71										
Long Pond pH		8.18										
Total Volume Treated/Cycle	**gallons**	8285										
Total Operating Days/Cycle	**No. Days**	3 Days										
Average Daily Volume	**gpd**	2761										
Average System Flowrate	**gpm**	1.91										
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date:												
TIME		6:30	7:30	8:30	9:00							
OPERATOR INITIALS:												
GSF Influent Flowrate	**gpm**	3	3	3	3							
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	21942	21737	21588	21500							
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.8	18.9	18.9	18.9							
Temperature – GSF Effluent		18	18	18	18							
Turbidity – GSF Influent		.079/.020	.080/.020	.080/.020	.080/.020							
Diss, Oxygen – GSF Influent		6.73	6.18	6.56	6.42							
Diss, Oxygen – GSF Effluent		7.99	5.52	5.25	5.18							
pH – GSF Influent		7.34	7.39	7.39	7.37							
pH – GSF Effluent		7.4		7.4	7.4							7.4
TDS – GSF Influent		90		90	89							
TDS – GSF Effluent		91		93	91							
Sp. Cond. – GSF Influent		180		180	178							
Sp. Cond – GSF Effluent		182		186	182							
Cl Residual – GSF Influent		1.27	1.27	1.27	1.35							
Cl Residual – GSF Effluent		1.19	1.25	1.24	1.22							
Manganese – GSF Influent		0.006		0.006	ND							
Manganese – GSF Effluent		ND		ND	ND							
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe		ND										
Long Pond Mn		0.032										
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO		7.71										
		8.18										
Total Volume Treated/Cycle	**gallons**	13058										
Total Operating Days/Cycle	**No. Days**	3 Days										
Average Daily Volume	**gpd**	4352										
Average System Flowrate	**gpm**	3.02										
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date:6.2.23												
TIME		6:30	7:30	8:30	9:00							
OPERATOR INITIALS:												
GSF Influent Flowrate	**gpm**	4.1	4.1	4.1	4.1							
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	22602	22326	22127	22020							
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.8	18.9	18.9	18.9							
Temperature – GSF Effluent		18	18		18							
Turbidity – GSF Influent		.079/.020	.080/.020	.080/.020	.080/.020							
Diss, Oxygen – GSF Influent		6.73	6.18	6.56	6.42							
Diss, Oxygen – GSF Effluent		5.2	5.16	4.99	5.25							
pH – GSF Influent		7.34	7.39	7.39	7.37							
pH – GSF Effluent				7.4	7.4							7.4
TDS – GSF Influent		90		90	89							
TDS – GSF Effluent				91	92							
Sp. Cond. – GSF Influent		180		180	178							
Sp. Cond – GSF Effluent				182	184							
Cl Residual – GSF Influent		1.27	1.27	1.27	1.35							
Cl Residual – GSF Effluent		1.22	1.2	1.25	1.25							
Manganese – GSF Influent		0.006		0.006	ND							
Manganese – GSF Effluent		ND		ND	ND							
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe		ND										
Long Pond Mn		0.032										
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO		7.71										
		8.18										
Total Volume Treated/Cycle	**gallons**	17398										
Total Operating Days/Cycle	**No. Days**	3 Days										
Average Daily Volume	**gpd**	5799										
Average System Flowrate	**gpm**	4.02										
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												HWWC Influent Chlorine Analyzer Calibrated 6/5/23
DATE:6.4.23												
TIME		15:30	16:30									
OPERATOR INITIALS:SM												
GSF Influent Flowrate	**gpm**	1.9	1.9									
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	5071	4937									
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		20.1	20.1									
Temperature – GSF Effluent			20									
Turbidity – GSF Influent		.084/.023	.084/.023									
Diss, Oxygen – GSF Influent		5.41	5.56									
Diss, Oxygen – GSF Effluent		4.89	4.99									
pH – GSF Influent		7.41	7.41									7.41
pH – GSF Effluent		7.4	7.4									7.4
TDS – GSF Influent		90	90									
TDS – GSF Effluent		93	92									
Sp. Cond. – GSF Influent		180	180									
Sp. Cond – GSF Effluent		186	184									
Cl Residual – GSF Influent		1.04/1.35	1.04/1.35									
Cl Residual – GSF Effluent		1.1	1.12									
Manganese – GSF Influent		ND	ND									
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn												
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond Dissolved Oxygen												
Long Pond pH												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date:6.4.23												
TIME		15:30	16:30									
OPERATOR INITIALS:												
GSF Influent Flowrate	**gpm**	3.1	3									
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	11346	11123									
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		20.1	20.1									
Temperature – GSF Effluent		20	20									
Turbidity – GSF Influent		.084/.023	.084/.023									
Diss, Oxygen – GSF Influent		5.41	5.56									
Diss, Oxygen – GSF Effluent		5.26	5.19									
pH – GSF Influent		7.41	7.41									7.41
pH – GSF Effluent		7.4	7.4									7.4
TDS – GSF Influent		90	90									
TDS – GSF Effluent		94	92									
Sp. Cond. – GSF Influent		180	180									
Sp. Cond – GSF Effluent		188	184									
Cl Residual – GSF Influent		1.04/1.35	1.04/1.35									
Cl Residual – GSF Effluent		1.18	1.21									
Manganese – GSF Influent		ND	ND									
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.037	0.04									
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date:6.4.23												
TIME		15:30	16:30									
OPERATOR INITIALS:												
GSF Influent Flowrate	**gpm**	4	4									
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	8387	8122									
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		20.1	20.1									
Temperature – GSF Effluent			20									
Turbidity – GSF Influent		.084/.023	.084/.023									
Diss, Oxygen – GSF Influent		5.41	5.56									
Diss, Oxygen – GSF Effluent		4.98	5.21									
pH – GSF Influent		7.41	7.41									
pH – GSF Effluent		7.4	7.4									7.4
TDS – GSF Influent		90	90									
TDS – GSF Effluent		91	89									
Sp. Cond. – GSF Influent		180	180									
Sp. Cond – GSF Effluent		182	178									
Cl Residual – GSF Influent		1.04/1.35	1.04/1.35									
Cl Residual – GSF Effluent		1.15	1.18									
Manganese – GSF Influent		ND	ND									
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.037	0.04									
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE:6.5.23												
TIME		6:45	9:00	12:25	18:15							
OPERATOR INITIALS:SM												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9							
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	3256	2992	2587	6901							
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19.8	19.7	19.8	19.7							
Temperature – GSF Effluent		20	20	20	20							
Turbidity – GSF Influent		.080/.020	.080/.020	.080/.020	.080/.020							
Diss, Oxygen – GSF Influent		4.89	4.94	4.2	4.76							
Diss, Oxygen – GSF Effluent		4.61	4.5	3.85	3.81							
pH – GSF Influent		7.42	7.42	7.42	7.42							7.42
pH – GSF Effluent		7.4	7.4	7.4	7.4							7.4
TDS – GSF Influent		90	89	93	92							
TDS – GSF Effluent		93	93	95	93							
Sp. Cond. – GSF Influent		180	178	186	184							
Sp. Cond – GSF Effluent		186	186	190	186							
Cl Residual – GSF Influent		1.25/1.40	1.44	1.2	1.75							
Cl Residual – GSF Effluent		1.19	1.22	1.5	1.53							
Manganese – GSF Influent		0.016	0.014	0.011	ND							
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.045	0.041	0.04								
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond Dissolved Oxygen												
Long Pond pH												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date:												
TIME		6:45	9:00	12:25	18:15							
OPERATOR INITIALS:												
GSF Influent Flowrate	**gpm**	3.1	3	3.1	3							
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	8456	8040	7384	6287							
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19.8	19.7	19.8	19.7							
Temperature – GSF Effluent		20	20	20	20							
Turbidity – GSF Influent		.080/.020	.080/.020	.080/.020	.080/.020							
Diss, Oxygen – GSF Influent		4.89	4.94	4.2	4.76							
Diss, Oxygen – GSF Effluent		4.61	4.75	4.09	4.09							
pH – GSF Influent		7.42	7.42	7.42	7.42							
pH – GSF Effluent		7.4	7.4	7.4	7.4							7.4
TDS – GSF Influent		90	89	93	92							
TDS – GSF Effluent		89	91	91	97							
Sp. Cond. – GSF Influent		180	178	186	184							
Sp. Cond – GSF Effluent		178	182	182	194							
Cl Residual – GSF Influent		1.25/1.40	1.44	1.2	1.75							
Cl Residual – GSF Effluent		1.19	1.18	1.5	1.55							
Manganese – GSF Influent		0.016	0.014	0.011	ND							
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.045	0.041	0.04								
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date:6.5.2023												7:50AM Backwash 35424 Gallons treated, 22 minute BW, 7 minute rinse
TIME		6:45	9:00	12:25	18:15							
OPERATOR INITIALS:												
GSF Influent Flowrate	**gpm**	3.8	3.9	3.9	3.9							
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	4807	39843	39004	37593							
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19.8	19.7	19.8	19.7							
Temperature – GSF Effluent		20	20	20	20							
Turbidity – GSF Influent		.080/.020	.080/.020	.080/.020	.080/.020							
Diss, Oxygen – GSF Influent		4.89	4.94	4.2	4.76							
Diss, Oxygen – GSF Effluent		4.42	4.4	3.29	3.51							
pH – GSF Influent		7.42	7.42	7.42	7.42							
pH – GSF Effluent		7.4	7.4	7.4	7.4							7.4
TDS – GSF Influent		90	89	93	92							
TDS – GSF Effluent		94	92	94	95							
Sp. Cond. – GSF Influent		180	178	186	184							
Sp. Cond – GSF Effluent		188	184	188	190							
Cl Residual – GSF Influent		1.25/1.40	1.44	1.2	1.75							
Cl Residual – GSF Effluent		1.2	1.2	1.5	1.56							
Manganese – GSF Influent		0.016	0.014	0.011	ND							
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.045	0.041	0.04								
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE:6.6.23												
TIME		7:10	8:00	9:00	10:05	16:20						
OPERATOR INITIALS:SM												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9	1.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	5395	5291	5177	5041	4311						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19.4	19.4	19.4	19.4	19.4						
Temperature – GSF Effluent		19	19	19	19	19						
Turbidity – GSF Influent		.081/.019	.081/.019	.080/.020	.080/.020	.080/.020						
Diss, Oxygen – GSF Influent		4.43	4.55	4.61	4.78	5.02						
Diss, Oxygen – GSF Effluent		4.06	4.19	3.9	4.22	4.81						
pH – GSF Influent		7.43	7.43	7.42	7.43	7.43						7.43
pH – GSF Effluent		7.4		7.4	7.4	7.4						7.4
TDS – GSF Influent		90		90	91	90						
TDS – GSF Effluent		92		95	94	92						
Sp. Cond. – GSF Influent		180		180	182	180						
Sp. Cond – GSF Effluent		184		190	188	184						
Cl Residual – GSF Influent		1.77	1.75	1.75	1.77	1.78						
Cl Residual – GSF Effluent		1.56	1.54	1.58	1.6	1.61						
Manganese – GSF Influent		ND		0.012	0.01	0.01						
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.023			0.024	0.029						
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond Dissolved Oxygen												
Long Pond pH												
Total Volume Treated/Cycle	**gallons**	19709										
Total Operating Days/Cycle	**No. Days**	7 Days										
Average Daily Volume	**gpd**	2815										
Average System Flowrate	**gpm**	1.95										
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date:6.6.23												
TIME		7:10	8:00	9:00	10:05	16:20						
OPERATOR INITIALS:												
GSF Influent Flowrate	**gpm**	3.1	3	3.1	3.1	3						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	3892	3728	3544	3327	2162						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19.4	19.4	19.4	19.4	19.4						
Temperature – GSF Effluent		19	19	19	19	19						
Turbidity – GSF Influent		.081/.019	.081/.019	.080/.020	.080/.020	.080/.020						
Diss, Oxygen – GSF Influent		4.43	4.55	4.61	4.78	5.02						
Diss, Oxygen – GSF Effluent		3.81	4.08	4.22	4.39	4.89						
pH – GSF Influent		7.43	7.43	7.42	7.43	7.43						7.43
pH – GSF Effluent		7.4		7.4	7.4	7.4						7.4
TDS – GSF Influent		90		90	91	90						
TDS – GSF Effluent		94		93	89	90						
Sp. Cond. – GSF Influent		180		180	182	180						
Sp. Cond – GSF Effluent		188		186	178	180						
Cl Residual – GSF Influent		1.77	1.75	1.75	1.77	1.78						
Cl Residual – GSF Effluent		1.52	1.58	1.56	1.6	1.61						
Manganese – GSF Influent		ND		0.012	0.01	0.01						
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.023			0.024	0.029						
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO												
Total Volume Treated/Cycle	**gallons**	31232										
Total Operating Days/Cycle	**No. Days**	7 days										
Average Daily Volume	**gpd**	4467										
Average System Flowrate	**gpm**	3.1										
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date:6.6.23												
TIME		7:10	8:00	9:00	10:05	16:20						
OPERATOR INITIALS:SM												
GSF Influent Flowrate	**gpm**	3.9	3.9	3.9	3.9	3.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	34523	34313	34075	33799	32307						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19.4	19.4	19.4	19.4	19.4						
Temperature – GSF Effluent		19	19	19	19	19						
Turbidity – GSF Influent		.081/.019	.081/.019	.080/.020	.080/.020	.080/.020						
Diss, Oxygen – GSF Influent		4.43	4.55	4.61	4.78	5.02						
Diss, Oxygen – GSF Effluent		3.91	3.99	4.14	4.22	4.6						
pH – GSF Influent		7.43	7.43	7.42	7.43	7.43						
pH – GSF Effluent		7.4	7.4	7.4	7.4	7.4						7.4
TDS – GSF Influent		90		90	91	90						
TDS – GSF Effluent		95		89	94	93						
Sp. Cond. – GSF Influent		180		180	182	180						
Sp. Cond – GSF Effluent		190		178	188	186						
Cl Residual – GSF Influent		1.77	1.75	1.75	1.77	1.78						
Cl Residual – GSF Effluent		1.55	1.65	1.69	1.63	1.59						
Manganese – GSF Influent		ND		0.012	0.01	0.01						
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.023			0.024	0.029						
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO												
Total Volume Treated/Cycle	**gallons**	41111										
Total Operating Days/Cycle	**No. Days**	7 days										
Average Daily Volume	**gpd**	5873										
Average System Flowrate	**gpm**	4.07										
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE:6.7.23												
TIME		7:00	8:00	10:45	13:10	16:45						
OPERATOR INITIALS:SM/MS												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9	1.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	2577	2454	2136	1865	1521						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19.1	19.1	19.2	19.2	19.1						
Temperature – GSF Effluent												
Turbidity – GSF Influent		.083/.019	.083/.019	.084/.019	.084/.019	.084/.019						
Diss, Oxygen – GSF Influent		4.82	5.05	3.95	4.41	5.19						
Diss, Oxygen – GSF Effluent		4.72	4.76	3.95	5.7	3.78						
pH – GSF Influent		7.42	7.42	7.41	7.41	7.42						7.42
pH – GSF Effluent		7.4	7.4	7.3	6.92	7.02						7.21
TDS – GSF Influent		91	90	96	110	103						
TDS – GSF Effluent		90	94	96	110	111						
Sp. Cond. – GSF Influent		182	180	197	221	206						
Sp. Cond – GSF Effluent		180	188	197	220	222						
Cl Residual – GSF Influent		1.51	1.53	1.54	1.55	1.58						
Cl Residual – GSF Effluent		1.44	1.42	1.39	1.38	1.33						
Manganese – GSF Influent		0.009			0.013	0.005						
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.017			0.042	0.023						
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond Dissolved Oxygen												
Long Pond pH												
Total Volume Treated/Cycle	**gallons**	23479										
Total Operating Days/Cycle	**No. Days**	8										
Average Daily Volume	**gpd**	2934										
Average System Flowrate	**gpm**	2.03										
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												backwashed in the morining, 35,631 treated, 22 min backwash, 7 min rinse
Date:6.7.23												
TIME		7:00	8:00	10:45	13:10	16:45						
OPERATOR INITIALS:SM/MS												
GSF Influent Flowrate	**gpm**	3.1	3.0	3.1	3.1	3.0						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	435	35942	35431	34993	34440						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19.1	19.1	19.2	19.2	19.1						
Temperature – GSF Effluent												
Turbidity – GSF Influent		.083/.019	.083/.019	.084/.019	.084/.019	.084/.019						
Diss, Oxygen – GSF Influent		4.82	5.05	3.95	4.41	5.19						
Diss, Oxygen – GSF Effluent		4.46	4.64	2.78	5.09	4.97						
pH – GSF Influent		7.42	7.42	7.41	7.41	7.42						
pH – GSF Effluent		7.4	7.4	7.3	7.1	7.16						7.27
TDS – GSF Influent		91	90	96	110	103						
TDS – GSF Effluent		94	93	93	110	110						
Sp. Cond. – GSF Influent		182	180	197	221	206						
Sp. Cond – GSF Effluent		188	186	187	220	221						
Cl Residual – GSF Influent		1.51	1.53	1.54	1.55	1.58						
Cl Residual – GSF Effluent		1.42	1.44	1.41	1.38	1.46						
Manganese – GSF Influent		0.009			0.013	0.005						
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.017			0.042	0.023						
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO												
Total Volume Treated/Cycle	**gallons**	1805										
Total Operating Days/Cycle	**No. Days**	9.5 hours										
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**	3.16										
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date:6.7.23												
TIME		7:00	8:00	10:45	13:10	16:45						
OPERATOR INITIALS:SM/MS												
GSF Influent Flowrate	**gpm**	3.9	3.9	3.9	3.9	3.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	28829	28522	27838	27325	26624						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19.1	19.1	19.2	19.2	19.1						
Temperature – GSF Effluent		19	19									
Turbidity – GSF Influent		.083/.019	.083/.019	.084/.019	.084/.019	.084/.019						
Diss, Oxygen – GSF Influent		4.82	5.05	3.95	4.41	5.19						
Diss, Oxygen – GSF Effluent		4.56	4.81	4.45	4.81	4.74						
pH – GSF Influent		7.42	7.42	7.41	7.41	7.42						
pH – GSF Effluent		7.4	7.4	7.4	7.1	7.2						7.30
TDS – GSF Influent		91	90	96	110	103						
TDS – GSF Effluent		94	91	92	110	110						
Sp. Cond. – GSF Influent		182	180	197	221	206						
Sp. Cond – GSF Effluent		188	182	184	221	221						
Cl Residual – GSF Influent		1.51	1.53	1.54	1.55	1.58						
Cl Residual – GSF Effluent		1.39	1.44	1.35	1.45	1.44						
Manganese – GSF Influent		0.009			0.013	0.005						
Manganese – GSF Effluent												
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn		0.017			0.042	0.023						
Sulfate – GSF Influent		2										
Sulfate – GSF Effluent		2										
Long Pond DO												
Total Volume Treated/Cycle	**gallons**	13685										
Total Operating Days/Cycle	**No. Days**	2 days										
Average Daily Volume	**gpd**	6688										
Average System Flowrate	**gpm**	~4.64										
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												7am: increased backwash Capacity to 36,000 gal
DATE:6.8.23												
TIME		6:40	9:00	12:00	14:30	16:30						
OPERATOR INITIALS:MS												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9	1.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	808	9503	9162	8891	8661						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36	36	35	34	35						
GSF Effluent Pressure	**psig**			5								
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.9	18.8	18.8	18.8	18.8						
Temperature – GSF Effluent		20.4		20	20.2	19.8						
Turbidity – GSF Influent		.086/.019	.086/.019	.086/.019	.086/.019	.086/.019						
Diss, Oxygen – GSF Influent		7.2	3.11	3.94	5.39	5.15						
Diss, Oxygen – GSF Effluent		7.44	5.39	4.94	3.47	3.49						
pH – GSF Influent		7.43	7.43	7.43	7.43	7.36						7.42
pH – GSF Effluent		7.03	7.32	7.31	7.08	7.14						7.18
TDS – GSF Influent		101.5	101.5	99	102	101						
TDS – GSF Effluent		102	98.5	99.45	99.65	102						
Sp. Cond. – GSF Influent		203	203	198	204	202						
Sp. Cond – GSF Effluent		204	197	798.9	199.3	204						
Cl Residual – GSF Influent		1.62	1.62	1.61	1.61	1.61						
Cl Residual – GSF Effluent		1.24	1.33	1.37	1.39	1.38						
Manganese – GSF Influent		0.012	0.014	0.02	0.013	0.02						
Manganese – GSF Effluent		0.003	0.018	0.003	ND	0.006						
Iron – GSF Influent												
Iron – GSF Effluent				0.03								
Long Pond Fe				0.06								
Long Pond Mn		0.024	0.029	0.031	0.039	0.044						
Sulfate – GSF Influent												
Sulfate – GSF Effluent					0							
Long Pond Dissolved Oxygen												
Long Pond pH												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date:6.8.23												
TIME		6:40	9:00	12:00	14:30	16:30						
OPERATOR INITIALS:MS												
GSF Influent Flowrate	**gpm**	3.1	3.1	3.1	3	3.1						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	31683	31195	30644	30209	29838						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36	36	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.9	18.8	18.8	18.8	18.8						
Temperature – GSF Effluent		20.4		20.2	20.2	20.2						
Turbidity – GSF Influent		.086/.019	.086/.019	.086/.019	.086/.019	.086/.019						
Diss, Oxygen – GSF Influent		7.2	3.11	3.94	5.39	5.15						
Diss, Oxygen – GSF Effluent		5.13	4.82	4.7	4.4	4.94						
pH – GSF Influent		7.43	7.43	7.43	7.43	7.36						
pH – GSF Effluent		7.23	7.23	7.24	7.22	7.23						7.23
TDS – GSF Influent		101.5	101.5	99	102	101						
TDS – GSF Effluent		101	101.5	101	102	101.5						
Sp. Cond. – GSF Influent		203	203	198	204	202						
Sp. Cond – GSF Effluent		202	203	202	204	204						
Cl Residual – GSF Influent		1.62	1.62	1.61	1.61	1.61						
Cl Residual – GSF Effluent		1.5	1.44	1.48	1.48	1.5						
Manganese – GSF Influent		0.012	0.014	0.02	0.013	0.02						
Manganese – GSF Effluent		0.007	0.02	0.002	0.012	0.006						
Iron – GSF Influent				0.03		ND						
Iron – GSF Effluent				0.03								
Long Pond Fe				0.06								
Long Pond Mn		0.024	0.029	0.031	0.039	0.044						
Sulfate – GSF Influent												
Sulfate – GSF Effluent					0							
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date:6.8.23												
TIME		6:40	9:00	12:00	14:30	16:30						
OPERATOR INITIALS:MS												
GSF Influent Flowrate	**gpm**	3.9	3.9	3.9	3.9	3.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	23151	22537	21842	21293	20825						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	36	36	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.9	18.8	18.8	18.8	18.8						
Temperature – GSF Effluent		20.4		20	20.2	20						
Turbidity – GSF Influent		.086/.019	.086/.019	.086/.019	.086/.019	.086/.019						
Diss, Oxygen – GSF Influent		7.2	3.11	3.94	5.39	5.15						
Diss, Oxygen – GSF Effluent		4.86	4.82	3.86	5.17	5.05						
pH – GSF Influent		7.43	7.43	7.43	7.43	7.36						
pH – GSF Effluent		7.27	7.25	7.2	7.21	7.28						7.24
TDS – GSF Influent		101.5	101.5	99	102	101						
TDS – GSF Effluent		98.95	101.5	101.5	99.6	99.15						
Sp. Cond. – GSF Influent		203	203	198	204	202						
Sp. Cond – GSF Effluent		197.9	203	203	199.2	198.3						
Cl Residual – GSF Influent		1.62	1.62	1.61	1.61	1.61						
Cl Residual – GSF Effluent		1.42	1.5	1.47	1.51	1.48						
Manganese – GSF Influent		0.012	0.014	0.02	0.013	0.02						
Manganese – GSF Effluent		0.011	0.012	0.005	0.005	0.008						
Iron – GSF Influent				0.03		ND						
Iron – GSF Effluent				ND								
Long Pond Fe				0.06								
Long Pond Mn		0.024	0.029	0.031	0.039	0.044						
Sulfate – GSF Influent												
Sulfate – GSF Effluent					0							
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE:6.9.23												
TIME		6:50	8:10	11:30	14:00	16:00						
OPERATOR INITIALS:MS												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9	1.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	6980	6819	6432	6135	5905						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	34	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.4	18.4	18.5	18.5	18.4						
Temperature – GSF Effluent		20.1	19.5	19.6	19.6	19.8						
Turbidity – GSF Influent		.086/.019	.086/.019	.086/.019	.087/.019	.087/.019						
Diss, Oxygen – GSF Influent		3.29	3.06	2.99	3.37	3.34						
Diss, Oxygen – GSF Effluent		2.38	5.3	5033	5.13	5.04						
pH – GSF Influent		7.43	7.43	7.43	7.43	7.4						7.42
pH – GSF Effluent		7.32	7.37	7.44	7.37	7.22						7.34
TDS – GSF Influent		99.7	101.5	102	101.5	101.5						
TDS – GSF Effluent		101	99.5	99.3	101.5	101.5						
Sp. Cond. – GSF Influent		199.4	203	204	203	203						
Sp. Cond – GSF Effluent		202	199.1	198.4	203	203						
Cl Residual – GSF Influent		1.6	1.61	1.61	1.65	1.66						
Cl Residual – GSF Effluent		1.35	1.27	1.4	1.41	1.4						
Manganese – GSF Influent						0.032						
Manganese – GSF Effluent						0.014						
Iron – GSF Influent		0.9										
Iron – GSF Effluent		0.3										
Long Pond Fe		0.13										
Long Pond Mn						0.028						
Sulfate – GSF Influent				0								
Sulfate – GSF Effluent				0								
Long Pond Dissolved Oxygen												
Long Pond pH												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date:6.9.23												
TIME		6:50	8:10	11:30	14:00	16:00						
OPERATOR INITIALS:MS												
GSF Influent Flowrate	**gpm**	3.1	3	3	3	3						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	27134	26878	26257	25780	25409						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	34	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.4	18.4	18.5	18.5	18.4						
Temperature – GSF Effluent		20	19.6	19.6	19.8	19.9						
Turbidity – GSF Influent		.086/.019	.086/.019	.086/.019	.087/.019	.087/.019						
Diss, Oxygen – GSF Influent		3.29	3.06	2.99	3.37	3.34						
Diss, Oxygen – GSF Effluent		2.83	5.27	4.96	4.86	4.83						
pH – GSF Influent		7.43	7.43	7.43	7.43	7.4						
pH – GSF Effluent		7.04	7.33	7.3	7.33	7.35						7.27
TDS – GSF Influent		99.7	101.5	102	101.5	101.5						
TDS – GSF Effluent		101	99.5	99.3	101.5	101.5						
Sp. Cond. – GSF Influent		199.4	203	204	203	203						
Sp. Cond – GSF Effluent		202	201	204	203	203						
Cl Residual – GSF Influent		1.6	1.61	1.61	1.65	1.66						
Cl Residual – GSF Effluent		1.41	1.45	1.48	1.53	1.41						
Manganese – GSF Influent						0.32						
Manganese – GSF Effluent						0.003						
Iron – GSF Influent		0.9										
Iron – GSF Effluent		0.2										
Long Pond Fe		0.13										
Long Pond Mn						0.028						
Sulfate – GSF Influent				0								
Sulfate – GSF Effluent				0								
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date:6.9.23												
TIME		6:50	8:10	11:30	14:00	16:00						
OPERATOR INITIALS:MS												
GSF Influent Flowrate	**gpm**	3.9	3.9	3.9	3.9	3.8						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	17422	17014	16324	15725	15261						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	34	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.4	18.4	18.5	18.5	18.4						
Temperature – GSF Effluent		20	19.7	19.8	19.9	19.8						
Turbidity – GSF Influent		.086/.019	.086/.019	.086/.019	.087/.019	.087/.019						
Diss, Oxygen – GSF Influent		3.29	3.06	2.99	3.37	3.34						
Diss, Oxygen – GSF Effluent		4.55	4.49	4.74	4.91	5						
pH – GSF Influent		7.43	7.43	7.43	7.43	7.4						
pH – GSF Effluent		7.15	7.29	7.29	7.33	7.41						7.29
TDS – GSF Influent		99.7	101.5	102	101.5	101.5						
TDS – GSF Effluent		101.5	102	102	101.5	101.5						
Sp. Cond. – GSF Influent		199.4	203	204	203	203						
Sp. Cond – GSF Effluent		203	204	204	203	203						
Cl Residual – GSF Influent		1.6	1.61	1.61	1.65	1.66						
Cl Residual – GSF Effluent		1.41	1.38	1.46	1.52	1.47						
Manganese – GSF Influent						0.032						
Manganese – GSF Effluent						0.007						
Iron – GSF Influent		0.9										
Iron – GSF Effluent		0.2										
Long Pond Fe		0.13										
Long Pond Mn						0.028						
Sulfate – GSF Influent				0								
Sulfate – GSF Effluent				0								
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE: 6.10.23												
TIME		7:00	9:00	11:30	14:00	16:00						
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9	1.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	4149	3914	3620	3329	3094						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.6	18.3	18.4	18.6	18.8						
Temperature – GSF Effluent		19.6	19.5	19.6	19.6	19.8						
Turbidity – GSF Influent		.088/.019	.088/.019	.088/.019	.088/.019	.088/.019						
Diss, Oxygen – GSF Influent		3.13	5.56	5.6	5.56	3.78						
Diss, Oxygen – GSF Effluent		4.45	4.7	4.94	4.77	4.2						
pH – GSF Influent		7.4	7.51	7.52	7.51	7.5						7.49
pH – GSF Effluent		7.26	7.35	7.32	7.35	7.3						7.32
TDS – GSF Influent		99.45	101.5	101.5	102	101.5						
TDS – GSF Effluent		101.5	101.5	101	101.5	101.5						
Sp. Cond. – GSF Influent		198.9	203	203	204	203						
Sp. Cond – GSF Effluent		203	203	202	203	203						
Cl Residual – GSF Influent		1.63	1.58	1.52	1.58	1.47						
Cl Residual – GSF Effluent		1.31	1.25	1.34	1.34	1.35						
Manganese – GSF Influent						0.16						
Manganese – GSF Effluent						0.01						
Iron – GSF Influent		ND										
Iron – GSF Effluent		ND										
Long Pond Fe		ND										
Long Pond Mn						0.03						
Sulfate – GSF Influent				ND								
Sulfate – GSF Effluent				ND								
Long Pond Dissolved Oxygen												
Long Pond pH												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date: 6.10.23												
TIME		7:00	9:00	11:30	14:00	16:00						
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	3.1	3.1	3	3.1	3.1						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	22589	22211	21739	21266	20894						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.2	19.3	19.4	19.6	19.8						
Temperature – GSF Effluent		19.7	19.6	19.7	19.7	20						
Turbidity – GSF Influent		.088/.019	.088/.019	.088/.019	.088/.019	.088/.019						
Diss, Oxygen – GSF Influent		3.13	5.56	5.6	5.56	3.78						
Diss, Oxygen – GSF Effluent		4.78	4.56	4.83	4.85	4.89						
pH – GSF Influent		7.4	7.51	7.52	7.51	7.5						
pH – GSF Effluent		7.3	7.29	7.3	7.32	7.39						7.32
TDS – GSF Influent		99.45	101.5	101.5	102	101.5						
TDS – GSF Effluent		102	101.5	101.5	102	101.5						
Sp. Cond. – GSF Influent		198.9	203	203	204	203						
Sp. Cond – GSF Effluent		204	203	203	204	203						
Cl Residual – GSF Influent		1.63	1.58	1.52	1.58	1.47						
Cl Residual – GSF Effluent		1.4	1.49	1.39	1.4	1.42						
Manganese – GSF Influent						0.16						
Manganese – GSF Effluent						0.006						
Iron – GSF Influent		ND										
Iron – GSF Effluent		ND										
Long Pond Fe		ND										
Long Pond Mn						0.03						
Sulfate – GSF Influent				ND								
Sulfate – GSF Effluent				ND								
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date: 6.10.23												
TIME		7:00	9:00	11:30	14:00	16:00						
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	3.9	3.9	3.8	3.8	3.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	11731	11257	10667	10074	9610						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.2	19.3	19.4	19.6							
Temperature – GSF Effluent		19	19.7	19.7	19.8	19						
Turbidity – GSF Influent		.088/.019	.088/.019	.088/.019	.088/.019	.088/.019						
Diss, Oxygen – GSF Influent		3.13	5.54	5.6	5.56	3.78						
Diss, Oxygen – GSF Effluent		4.76	4.78	4.83	4.76	4.76						
pH – GSF Influent		7.4	7.51	7.52	7.51	7.5						
pH – GSF Effluent		7.31	7.32	7.33	7.33	7.4						7.34
TDS – GSF Influent		99.45	101.5	101.5	102	101.5						
TDS – GSF Effluent		99.45	101.5	101.5	102	101.5						
Sp. Cond. – GSF Influent		198.9	203	203	204	203						
Sp. Cond – GSF Effluent		203	203	203	203	203						
Cl Residual – GSF Influent		1.63	1.58	1.52	1.58	1.47						
Cl Residual – GSF Effluent		1.36	1.45	1.52	1.48	1.44						
Manganese – GSF Influent						0.016						
Manganese – GSF Effluent						0.001						
Iron – GSF Influent		ND										
Iron – GSF Effluent		ND										
Long Pond Fe		ND										
Long Pond Mn						0.03						
Sulfate – GSF Influent				ND								
Sulfate – GSF Effluent				ND								
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE:6.11.23												
TIME		7:00	9:30	12:00	14:00	16:00						
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9	1.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	1338	1044	751	517	282						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent			18.9	18.9	20.5	21.1						
Temperature – GSF Effluent			19.9	20.3	20.5	20.6						
Turbidity – GSF Influent		.090/.019	.090/.019	.090/.019	.089/.019	.090/.019						
Diss, Oxygen – GSF Influent		2.3	2.66	3.36	5.69	1.64						
Diss, Oxygen – GSF Effluent		4.27	4.24	4.75	3.03	2.77						
pH – GSF Influent		7.53	7.53	7.55	7.52	7.52						7.53
pH – GSF Effluent		7.17	7.27	7.35	7.17	7.14						7.22
TDS – GSF Influent		102	102	101.5	101.5	102						
TDS – GSF Effluent		101.5	101.5	101.5	101.5	102						
Sp. Cond. – GSF Influent		204	204	203	203	204						
Sp. Cond – GSF Effluent		203	203	203	203	204						
Cl Residual – GSF Influent		1.58	1.58	1.6	1.5	1.64						
Cl Residual – GSF Effluent		1.33	1.37	1.29	1.35	1.36						
Manganese – GSF Influent		0.015	0.02	0.021	0.007	0.012						
Manganese – GSF Effluent		0.011	0.01	0.009	0.005	0.05						
Iron – GSF Influent					0.01	ND						
Iron – GSF Effluent					ND	ND						
Long Pond Fe					0.02	ND						
Long Pond Mn		0.049	0.042	0.051	0.038	0.036						
Sulfate – GSF Influent					ND							
Sulfate – GSF Effluent												
Long Pond Dissolved Oxygen												
Long Pond pH												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date:6.11.23												
TIME		7:00	9:30	12:00	14:00	16:00						
OPERATOR INITIALS:MS												
GSF Influent Flowrate	**gpm**	3.1	3.1	3.1	3.1	3.1						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	18067	17596	17126	16750	16372						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19	19.9	19.9	20.5	21.1						
Temperature – GSF Effluent		19.8	20.1	20.4	20.7							
Turbidity – GSF Influent		.090/.019	.090/.019	.090/.019	.089/.019	.090/.019						
Diss, Oxygen – GSF Influent		2.3	2.66	3.36	5.69	1.64						
Diss, Oxygen – GSF Effluent		5.03	4.53	4.64	3.11	1.6						
pH – GSF Influent		7.53	7.53	7.55	7.52	7.52						see GSF #1 raw data
pH – GSF Effluent		7.26	7.29	7.32	7.13	7.14						7.23
TDS – GSF Influent		102	102	101.5	101.5	102						
TDS – GSF Effluent		101.5	102	99.45	102.5	102						
Sp. Cond. – GSF Influent		204	204	203	203	204						
Sp. Cond – GSF Effluent		203	204	198.9	205	204						
Cl Residual – GSF Influent		1.58	1.58	1.6	1.5	1.64						
Cl Residual – GSF Effluent		1.45	1.48	1.38	1.42	1.48						
Manganese – GSF Influent		0.015	0.02	0.021	0.007	0.012						
Manganese – GSF Effluent		0.006	0.008	0.01	0.002	0.015						
Iron – GSF Influent					0.01	ND						
Iron – GSF Effluent					ND	ND						
Long Pond Fe					0.02	ND						
Long Pond Mn		0.049	0.042	0.051	0.038	0.036						
Sulfate – GSF Influent					ND							
Sulfate – GSF Effluent												
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date:6.11.23												
TIME		7:00	9:30	12:00	14:00	16:00						
OPERATOR INITIALS:MS												
GSF Influent Flowrate	**gpm**	3.8	3.8	3.8	3.8	3.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	6084	5497	4909	4441	3967						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent			19.9									
Temperature – GSF Effluent		19.8	20.1	20.3	20.5	20.5						
Turbidity – GSF Influent		.090/.019	.090/.019	.090/.019	.089/.019	.090/.019						
Diss, Oxygen – GSF Influent		2.3	2.66	3.36	5.69	1.64						
Diss, Oxygen – GSF Effluent		5.18	4.94	4.75	3.11	2.12						
pH – GSF Influent		7.53	7.53	7.55	7.52	7.52						see GSF #1 raw data
pH – GSF Effluent		7.26	7.29	7.32	7.13	7.14						7.23
TDS – GSF Influent		102	102	101.5	101.5	102						
TDS – GSF Effluent		101.5	102	99.45	102.5	102						
Sp. Cond. – GSF Influent		204	204	203	203	204						
Sp. Cond – GSF Effluent		203	204	198.9	205	204						
Cl Residual – GSF Influent		1.58	1.58	1.6	1.5	1.64						
Cl Residual – GSF Effluent		1.45	1.48	1.38	1.42	1.48						
Manganese – GSF Influent		0.015	0.02	0.021	0.007	0.012						
Manganese – GSF Effluent		0.004	0.008	0.01	0.002	0.015						
Iron – GSF Influent					0.01	ND						
Iron – GSF Effluent					ND	ND						
Long Pond Fe					0.02	ND						
Long Pond Mn		0.049	0.042	0.051	0.038	0.036						
Sulfate – GSF Influent					ND							
Sulfate – GSF Effluent												
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE:6.12.23												
TIME		6:45	10:00	12:30	14:00	16:30						
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9	1.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	33601	33205	32910	32733	32436						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.4	18.5	18.6	18.6	18.6						
Temperature – GSF Effluent		20.6	20.9	21.4	21	21.5						
Turbidity – GSF Influent		.092/.019	.091/.019	.094/.019	.094/.019	.095/.019						
Diss, Oxygen – GSF Influent		2.03	2	1.88	1.63	1.32						
Diss, Oxygen – GSF Effluent		3.7	3.38	1.9	2.94	3.15						
pH – GSF Influent		7.44	7.43	7.43	7.43	7.4						7.43
pH – GSF Effluent		7.05	7.1	7.13	7.16	7.11						7.11
TDS – GSF Influent		102.5	102.5	102	102	102						
TDS – GSF Effluent		101.5	102	101.5	101.5	102						
Sp. Cond. – GSF Influent		205	205	204	204	204						
Sp. Cond – GSF Effluent		203	204	203	203	204						
Cl Residual – GSF Influent		1.61	1.58	1.58	1.57	1.55						
Cl Residual – GSF Effluent		1.35	1.41	1.39	1.42	1.37						
Manganese – GSF Influent		0.017	0.016	0.015	0.0104	0.007						
Manganese – GSF Effluent		0.007	0.006	0.014	0.004	0						
Iron – GSF Influent			ND									
Iron – GSF Effluent			ND									
Long Pond Fe			ND									
Long Pond Mn		0.038	0.026	0.03	0.047	0.031						
Sulfate – GSF Influent			ND									
Sulfate – GSF Effluent			ND									
Long Pond Dissolved Oxygen												
Long Pond pH												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date: 6.12.23												
TIME		6:45	10:00	12:30	14:00	16:30						
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	3	3.1	3.1	3.1	3						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	13590	12952	12497	12215	11744						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35		35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.4	18.5	18.6	18.6	18.6						
Temperature – GSF Effluent		20.5	20.7	20.7	21	20.9						
Turbidity – GSF Influent		.092/.019	.091/.019	.094/.019	.094/.019	.095/.019						
Diss, Oxygen – GSF Influent		2.03	2	1.88	1.63	1.32						
Diss, Oxygen – GSF Effluent		4.92	4.66	3.26	2.88	3.06						
pH – GSF Influent		7.44	7.43	7.43	7.43	7.4						
pH – GSF Effluent		7.29	7.28	7.11	7.17	7.08						7.19
TDS – GSF Influent		102.5	102.5	102	102	102						
TDS – GSF Effluent		102	102	101.5	101.5	102						
Sp. Cond. – GSF Influent		205	205	204	204	204						
Sp. Cond – GSF Effluent		204	204	203	203	204						
Cl Residual – GSF Influent		1.61	1.58	1.58	1.57	1.55						
Cl Residual – GSF Effluent		1.38	1.5	1.46	1.46	1.45						
Manganese – GSF Influent		0.017	0.016	0.015	0.0104	0.007						
Manganese – GSF Effluent		0.006	0.006	0.007	0.002	0.002						
Iron – GSF Influent			ND									
Iron – GSF Effluent			ND									
Long Pond Fe			ND									
Long Pond Mn		0.038	0.026	0.03	0.047	0.031						
Sulfate – GSF Influent			ND									
Sulfate – GSF Effluent			ND									
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date: 6.12.23												
TIME		6:45	10:00	12:30	14:00	16:30						
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	3.8	3.9	3.9	3.9	4						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	481	39814	39231	38871	38269						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35		35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.4	18.5	18.6	18.6	18.6						
Temperature – GSF Effluent		20.5	20.8	20.8	21	20.9						
Turbidity – GSF Influent		.092/.019	.091/.019	.094/.019	.094/.019	.095/.019						
Diss, Oxygen – GSF Influent		2.03	2	1.88	1.63	1.32						
Diss, Oxygen – GSF Effluent		4.88	4.76	2.99	2.82	2.92						
pH – GSF Influent		7.44	7.43	7.43	7.43	7.4						
pH – GSF Effluent		7.31	7.32	7.12	7.18	7.1						7.21
TDS – GSF Influent		102.5	102.5	102	102	102						
TDS – GSF Effluent		101.5	102	102	101.5	102						
Sp. Cond. – GSF Influent		205	205	204	204	204						
Sp. Cond – GSF Effluent		203	204	204	203	204						
Cl Residual – GSF Influent		1.61	1.58	1.58	1.57	1.55						
Cl Residual – GSF Effluent		1.41	1.52	1.51	1.5	1.45						
Manganese – GSF Influent		0.017	0.016	0.015	0.0104	0.007						
Manganese – GSF Effluent		0.002	ND	0.015	0.009	0						
Iron – GSF Influent			ND									
Iron – GSF Effluent			ND									
Long Pond Fe			ND									
Long Pond Mn		0.038	0.026	0.03	0.047	0.031						
Sulfate – GSF Influent			ND									
Sulfate – GSF Effluent			ND									
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE: 6.13.23												
TIME		7:00	8:00	10:00	12:30	15:45						
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	1.9	1.9	1.9	1.9	1.9						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	30720	30601	30362	30064	29678						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.8	18.8	18.8	18.9	18.9						
Temperature – GSF Effluent		20.7	20.9	20.9	21.7	21.2						
Turbidity – GSF Influent		.098/.020	.098/.020	.105/.020	.099/.020	.100/.020						
Diss, Oxygen – GSF Influent		1.52	1.75	1.58	2.95	3.09						
Diss, Oxygen – GSF Effluent		3.37	2.6	2.72	3.02	3.02						
pH – GSF Influent		7.43	7.43	7.43	7.42	7.42						7.43
pH – GSF Effluent		7.25	7.06	7.09	7.13	7.16						7.14
TDS – GSF Influent												
TDS – GSF Effluent												
Sp. Cond. – GSF Influent		205	203	204	192.4	203						
Sp. Cond – GSF Effluent		204	204	204	203	203						
Cl Residual – GSF Influent		1.61	1.6	1.58	1.54	1.52						
Cl Residual – GSF Effluent		1.38	1.28	1.44	1.31	1.31						
Manganese – GSF Influent		0.009		0.016	0.024	0.01						
Manganese – GSF Effluent		0.003		0.007	0.012	0.003						
Iron – GSF Influent		ND		ND								
Iron – GSF Effluent		ND		ND								
Long Pond Fe		ND		0.06		0.02						
Long Pond Mn		0.025		0.035	0.035	0.043						
Sulfate – GSF Influent				ND								
Sulfate – GSF Effluent												
Long Pond Dissolved Oxygen												
Long Pond pH												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date: 6.13.23												
TIME		7:00	8:00	10:00	12:30	15:45						
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	3	3	3.1	3.1	3.1						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	9018	8829	8449	7977	7363						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.8	18.8	18.8	18.9	18.9						
Temperature – GSF Effluent		21.7	20.8	20.9	20.9	21.2						
Turbidity – GSF Influent		.098/.020	.098/.020	.105/.020	.099/.020	.100/.020						
Diss, Oxygen – GSF Influent		1.52	1.75	1.58	2.95	3.09						
Diss, Oxygen – GSF Effluent		1.31	3.37	3.1	3.22	3.22						
pH – GSF Influent		7.43	7.43	7.43	7.42	7.42						
pH – GSF Effluent		7.08	7.08	7.11	7.14	7.16						7.11
TDS – GSF Influent												
TDS – GSF Effluent												
Sp. Cond. – GSF Influent		205	203	204	192.4	203						
Sp. Cond – GSF Effluent		203	204	203	203	202						
Cl Residual – GSF Influent		1.61	1.6	1.58	1.54	1.52						
Cl Residual – GSF Effluent		1.42	1.46	1.36	1.41	1.4						
Manganese – GSF Influent		0.009		0.016	0.024	0.01						
Manganese – GSF Effluent		ND		0.006	0.01	ND						
Iron – GSF Influent		ND		ND								
Iron – GSF Effluent		ND		ND								
Long Pond Fe		ND		0.06		0.02						
Long Pond Mn		0.025		0.035	0.035	0.043						
Sulfate – GSF Influent				ND								
Sulfate – GSF Effluent												
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date: 6.13.23												
TIME		7:00	8:00	10:00	12:30	15:45						
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	3.9	3.9	3.9	4	4						
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	34777	34537	34053	33450	32667						
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35	35	35	35	35						
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		18.8	18.8	18.8	18.9	18.9						
Temperature – GSF Effluent		20.8	20.8	20.9	20.9	21.2						
Turbidity – GSF Influent		.098/.020	.098/.020	.105/.020	.099/.020	.100/.020						
Diss, Oxygen – GSF Influent		1.52	1.75	1.58	2.95	3.09						
Diss, Oxygen – GSF Effluent		3.26	2.92	2.54	2.97	3.17						
pH – GSF Influent		7.43	7.43	7.43	7.42	7.42						
pH – GSF Effluent		7.1	7.08	7.11	7.14	7.16						7.12
TDS – GSF Influent												
TDS – GSF Effluent												
Sp. Cond. – GSF Influent		205	203	204	192.4	203						
Sp. Cond – GSF Effluent		203	203	203	203	203						
Cl Residual – GSF Influent		1.61	1.6	1.58	1.54	1.52						
Cl Residual – GSF Effluent		1.46	1.44	1.49	1.47	1.42						
Manganese – GSF Influent		0.009		0.016	0.024	0.01						
Manganese – GSF Effluent		0.007		0.003	0.009	0.005						
Iron – GSF Influent		ND		ND								
Iron – GSF Effluent		ND		ND								
Long Pond Fe		ND		ND		0.02						
Long Pond Mn		0.025		0.035	0.035	0.043						
Sulfate – GSF Influent				ND								
Sulfate – GSF Effluent												
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF1												
DATE: 6.14.23												
TIME		6:30										
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	1.9										
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	27928										
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19										
Temperature – GSF Effluent		21.3										
Turbidity – GSF Influent		.104/.020										
Diss, Oxygen – GSF Influent		2.31										
Diss, Oxygen – GSF Effluent		1.47										
pH – GSF Influent		7.43										7.43
pH – GSF Effluent		7.12										7.12
TDS – GSF Influent		102.5										
TDS – GSF Effluent		101.5										
Sp. Cond. – GSF Influent		205										
Sp. Cond – GSF Effluent		203										
Cl Residual – GSF Influent		1.47										
Cl Residual – GSF Effluent		1.22										
Manganese – GSF Influent		0.012										
Manganese – GSF Effluent		0.005										
Iron – GSF Influent		ND										
Iron – GSF Effluent		ND										
Long Pond Fe		0.02										
Long Pond Mn		0.019										
Sulfate – GSF Influent		ND										
Sulfate – GSF Effluent												
Long Pond Dissolved Oxygen												
Long Pond pH												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF2												
Date: 6.14.23												
TIME		6:30										
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	3.1										
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	4580										
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19										
Temperature – GSF Effluent		21.3										
Turbidity – GSF Influent		.104/.020										
Diss, Oxygen – GSF Influent		2.31										
Diss, Oxygen – GSF Effluent		1.77										
pH – GSF Influent		7.43										
pH – GSF Effluent		7.13										7.13
TDS – GSF Influent		102.5										
TDS – GSF Effluent		101										
Sp. Cond. – GSF Influent		205										
Sp. Cond – GSF Effluent		202										
Cl Residual – GSF Influent		1.47										
Cl Residual – GSF Effluent		1.32										
Manganese – GSF Influent		0.012										
Manganese – GSF Effluent		0.006										
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn												
Sulfate – GSF Influent												
Sulfate – GSF Effluent												
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

TABLE 3

HWWC GREENSAND FILTRATION SYSTEM PILOT PLANT OPERATIONAL VALIDATION DATA SUMMARY SYSTEM
SYSTEM FLOWRATES AND HYDRAULIC LOADING

GSF FILTER ID# GSF3												
Date: 6.14.23												
TIME		6:30										
OPERATOR INITIALS: MS												
GSF Influent Flowrate	**gpm**	4										
GSF Hydraulic Load	**gpm/ft^2**											
GSF Flowmeter Reading	**Gallons**											
Treated Volume - Interval	**Gallons**	29113										
Operating Interval Duration	**Hr:Min**											
Average Hydraulic Load	**gpm/ft^2**											
GSF Influent Pressure	**psig**	35										
GSF Effluent Pressure	**psig**											
GSF Differential Pressure	**ΔP**											
FIELD MONITORING:												average
Temperature – GSF Influent		19										
Temperature – GSF Effluent		21.3										
Turbidity – GSF Influent		.104/.020										
Diss, Oxygen – GSF Influent		2.31										
Diss, Oxygen – GSF Effluent		1.44										
pH – GSF Influent		7.43										
pH – GSF Effluent		7.11										7.11
TDS – GSF Influent		102.5										
TDS – GSF Effluent		101										
Sp. Cond. – GSF Influent		205										
Sp. Cond – GSF Effluent		202										
Cl Residual – GSF Influent		1.47										
Cl Residual – GSF Effluent		1.34										
Manganese – GSF Influent		0.012										
Manganese – GSF Effluent		0.016										
Iron – GSF Influent												
Iron – GSF Effluent												
Long Pond Fe												
Long Pond Mn												
Sulfate – GSF Influent												
Sulfate – GSF Effluent												
Long Pond DO												
Total Volume Treated/Cycle	**gallons**											
Total Operating Days/Cycle	**No. Days**											
Average Daily Volume	**gpd**											
Average System Flowrate	**gpm**											
Average Hydraulic Loading	**gpm/ft^2**											

HWWC GSF Pilot Plant Daily Operator Log

APPENDIX B

PILOT PLANT ANALYTICAL DATA-LABORATORY CERTIFICATES OF ANALYSIS

MICROBAC®

Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3E2836

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 05/31/2023
Reported: 06/07/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3E2836-01
Collected By: Customer
Collection Date: 05/30/2023 20:05

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/01/23 1650	06/02/23 1730	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**H1,Y**		05/31/23 1929	AMF
Color, Apparent	<1	1	CU	1	**Y**		05/31/23 1929	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			05/31/23 1929	AMF
SM 4500-H+ B-2000								
pH	**7.31**		S.U.	1	**H1**		05/31/23 1929	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/01/23 1041	06/01/23 1150	DLO
Iron	<0.0500	0.0500	mg/L	1		06/01/23 1041	06/01/23 1150	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3E2836-02
Collected By: Customer
Collection Date: 05/30/2023 20:05

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1039	06/05/23 1622	DLO

CERTIFICATE OF ANALYSIS

D3E2836

Client Sample ID: GSF2 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3E2836-03
Collected By: Customer
Collection Date: 05/30/2023 20:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/01/23 1650	06/02/23 1730	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**H1,Y**		05/31/23 1929	AMF
Color, Apparent	<1	1	CU	1	**Y**		05/31/23 1929	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			05/31/23 1929	AMF
SM 4500-H+ B-2000								
pH	**7.37**		S.U.	1	**H1**		05/31/23 1929	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/01/23 1041	06/01/23 1154	DLO
Iron	<0.0500	0.0500	mg/L	1		06/01/23 1041	06/01/23 1154	DLO

Client Sample ID: GSF2 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3E2836-04
Collected By: Customer
Collection Date: 05/30/2023 20:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1039	06/05/23 1626	DLO

CERTIFICATE OF ANALYSIS

D3E2836

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3E2836-05	**Collection Date:**	05/30/2023 20:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-1997								
Total Suspended Solids (TSS)	<6.25	6.25	mg/L	3	**Y**	06/01/23 1650	06/02/23 1730	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**H1,Y**		05/31/23 1929	AMF
Color, Apparent	<1	1	CU	1	**Y**		05/31/23 1929	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			05/31/23 1929	AMF
SM 4500-H+ B-2000								
pH	**7.49**		S.U.	1	**H1**		05/31/23 1929	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/01/23 1041	06/01/23 1205	DLO
Iron	<0.0500	0.0500	mg/L	1		06/01/23 1041	06/01/23 1205	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3E2836-06	**Collection Date:**	05/30/2023 20:15

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1039	06/05/23 1630	DLO

Client Sample ID:	GSF-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3E2836-07	**Collection Date:**	05/30/2023 20:20

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/01/23 1535	EMK

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3E2836-08	**Collection Date:**	05/30/2023 20:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/01/23 1535	EMK
SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/01/23 1650	06/02/23 1730	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**H1,Y**		05/31/23 1929	AMF
Color, Apparent	<1	1	CU	1	**Y**		05/31/23 1929	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			05/31/23 1929	AMF
SM 4500-H+ B-2000								
pH	**7.67**		S.U.	1	**H1**		05/31/23 1929	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/01/23 1041	06/01/23 1208	DLO
Iron	<0.0500	0.0500	mg/L	1		06/01/23 1041	06/01/23 1208	DLO

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3E2836-09	**Collection Date:**	05/30/2023 20:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1039	06/05/23 1635	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/07/2023 16:16

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Chain of Custody

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NWSI - Northeast Water Solutions, inc.

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

WWW.Microbac.com

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity					Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	
GSF1- Effluent	5/30/23	20:05		X	dw	3	x	x	x						X		X			
GSF2- Effluent		20:10		X	dw	3	x	x	x						X		X			
GSF3 - Effluent		20:15		X	dw	3	x	x	x						X		X			
GSF-Effluent		20:20	X		dw	1				X					X		X			
GSF- Influent		20:00		X	dw	4	X	X	X	X					X		X			

PRESERVATIVE VERIFIED Initials

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	5/31/23	10:25
RECEIVED:	5/31/23	10:25
RELINQUISHED:	5/31/23	1317
RECEIVED:	5/31/23	1317
RELINQUISHED:	5/31/23	1707
RECEIVED:	5/31/23	1707

TURNAROUND (INDICATE IN CALENDAR DAYS): _____ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 10.4 °C Upon Receipt at LAB

9.6

9.6°C ok

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3E2841

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 05/31/2023
Reported: 06/16/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3E2841-01
Collected By: Customer
Collection Date: 05/31/2023 9:05

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/01/23 1650	06/02/23 1730	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**H1,Y**		05/31/23 1929	AMF
Color, Apparent	<1	1	CU	1	**Y**		05/31/23 1929	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			05/31/23 1929	AMF
SM 4500-H+ B-2000								
pH	**7.29**		S.U.	1	**H1**		05/31/23 1929	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/01/23 1041	06/01/23 1212	DLO
Iron	<0.0500	0.0500	mg/L	1		06/01/23 1041	06/01/23 1212	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3E2841-02
Collected By: Customer
Collection Date: 05/31/2023 9:05

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1039	06/05/23 1639	DLO

CERTIFICATE OF ANALYSIS

D3E2841

Client Sample ID: GSF2 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3E2841-03
Collected By: Customer
Collection Date: 05/31/2023 9:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/01/23 1650	06/02/23 1730	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**H1,Y**		05/31/23 1929	AMF
Color, Apparent	<1	1	CU	1	**Y**		05/31/23 1929	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			05/31/23 1929	AMF
SM 4500-H+ B-2000								
pH	**7.52**		S.U.	1	**H1**		05/31/23 1929	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/01/23 1041	06/01/23 1216	DLO
Iron	<0.0500	0.0500	mg/L	1		06/01/23 1041	06/01/23 1216	DLO

Client Sample ID: GSF2 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3E2841-04
Collected By: Customer
Collection Date: 05/31/2023 9:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1039	06/05/23 1652	DLO

CERTIFICATE OF ANALYSIS

D3E2841

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3E2841-05	**Collection Date:**	05/31/2023 9:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/01/23 1650	06/02/23 1730	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**H1,Y**		05/31/23 1929	AMF
Color, Apparent	<1	1	CU	1	**Y**		05/31/23 1929	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			05/31/23 1929	AMF
SM 4500-H+ B-2000								
pH	**7.54**		S.U.	1	**H1**		05/31/23 1929	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/01/23 1041	06/01/23 1227	DLO
Iron	<0.0500	0.0500	mg/L	1		06/01/23 1041	06/01/23 1227	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3E2841-06	**Collection Date:**	05/31/2023 9:15

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1039	06/05/23 1656	DLO

Client Sample ID:	GSF-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3E2841-07	**Collection Date:**	05/31/2023 9:20

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**85.0**	1.00	mg CaCO3/L	1			06/01/23 1535	EMK

CERTIFICATE OF ANALYSIS

D3E2841

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3E2841-08	**Collection Date:**	05/31/2023 9:20

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/01/23 1535	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/01/23 1650	06/02/23 1730	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**H1,Y**		05/31/23 1929	AMF
Color, Apparent	<1	1	CU	1	**Y**		05/31/23 1929	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			05/31/23 1929	AMF
SM 4500-H+ B-2000								
pH	**7.54**		S.U.	1	**H1**		05/31/23 1929	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/01/23 1041	06/01/23 1230	DLO
Iron	<0.0500	0.0500	mg/L	1		06/01/23 1041	06/01/23 1230	DLO

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3E2841-09	**Collection Date:**	05/31/2023 9:20

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1039	06/05/23 1701	DLO

Client Sample ID:	Slow Sand #1		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3E2841-10	**Collection Date:**	05/31/2023 9:00

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00217**	0.00204	mg/L	1		06/01/23 1041	06/01/23 1234	DLO
Iron	<0.0500	0.0500	mg/L	1		06/01/23 1041	06/01/23 1234	DLO

Client Sample ID: Slow Sand #1
Sample Matrix: Drinking Water
Lab Sample ID: D3E2841-11
Collected By: Customer
Collection Date: 05/31/2023 9:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00210**	0.00204	mg/L	1		06/02/23 1039	06/05/23 1705	DLO

Client Sample ID: Slow Sand #2
Sample Matrix: Drinking Water
Lab Sample ID: D3E2841-12
Collected By: Customer
Collection Date: 05/31/2023 9:00

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/01/23 1041	06/01/23 1238	DLO
Iron	<0.0500	0.0500	mg/L	1		06/01/23 1041	06/01/23 1238	DLO

Client Sample ID: Slow Sand #2
Sample Matrix: Drinking Water
Lab Sample ID: D3E2841-13
Collected By: Customer
Collection Date: 05/31/2023 9:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1039	06/05/23 1718	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/16/2023 14:14

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NWSI - Northeast Water Solutions, inc.

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

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Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	
GSF1- Effluent	5/31/23	9:05		X	dw	3	x	x	x							X		X			
GSF2- Effluent		9:10		X	dw	3	x	x	x							X		X			
GSF3 - Effluent		9:15		X	dw	3	x	x	x							X		X			
GSF-Effluent		9:20	X		dw	1				X						X		X			
GSF- Influent		9:20		X	dw	4	X	X	X	X						X		X			
Slow Sand #1		9:00		X	dw	2		X	X							X		X			
Slow Sand #2		9:00		X	dw	2		X	x							X		X			

PRESERVATIVE VERIFIED Initials

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	5/31/23	10:25
RECEIVED:	5-31-23	10:25
RELINQUISHED:	5-31-23	1317
RECEIVED:		1317
RELINQUISHED:	5-31-23	1707
RECEIVED:	5/31/23	1707

TURNAROUND (INDICATE IN CALENDAR DAYS):

HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 19.4 °C Upon Receipt at LAB 3.6°C ut

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0197

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/01/2023
Reported: 06/16/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0197-01
Collected By: Customer
Collection Date: 06/01/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/05/23 1545	06/06/23 1740	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/01/23 2059	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/01/23 2059	AMF
SM 2130 B-2001								
Turbidity	**0.230**	0.100	NTU	1			06/01/23 2059	AMF
SM 4500-H+ B-2000								
pH	**7.26**		S.U.	1	**H1**		06/01/23 2059	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1035	06/02/23 1432	DLO
Iron	<0.0500	0.0500	mg/L	1		06/02/23 1035	06/02/23 1432	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0197-02
Collected By: Customer
Collection Date: 06/01/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1307	06/06/23 2058	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0197-03	**Collection Date:**	06/01/2023 8:05

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/05/23 1545	06/06/23 1740	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/01/23 2059	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/01/23 2059	AMF
SM 2130 B-2001								
Turbidity	**0.180**	0.100	NTU	1			06/01/23 2059	AMF
SM 4500-H+ B-2000								
pH	**7.50**		S.U.	1	**H1**		06/01/23 2059	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1035	06/02/23 1435	DLO
Iron	<0.0500	0.0500	mg/L	1		06/02/23 1035	06/02/23 1435	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0197-04	**Collection Date:**	06/01/2023 8:05

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1307	06/06/23 2101	DLO

CERTIFICATE OF ANALYSIS

D3F0197

Client Sample ID: GSF3 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0197-05
Collected By: Customer
Collection Date: 06/01/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/05/23 1545	06/06/23 1740	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/01/23 2059	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/01/23 2059	AMF
SM 2130 B-2001								
Turbidity	**0.280**	0.100	NTU	1			06/01/23 2059	AMF
SM 4500-H+ B-2000								
pH	**7.51**		S.U.	1	**H1**		06/01/23 2059	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1035	06/02/23 1439	DLO
Iron	<0.0500	0.0500	mg/L	1		06/02/23 1035	06/02/23 1439	DLO

Client Sample ID: GSF3 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0197-06
Collected By: Customer
Collection Date: 06/01/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1307	06/06/23 2105	DLO

Client Sample ID: GSF-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0197-07
Collected By: Customer
Collection Date: 06/01/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**85.0**	1.00	mg CaCO3/L	1			06/01/23 1955	EMK

CERTIFICATE OF ANALYSIS

D3F0197

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0197-08
Collected By: Customer
Collection Date: 06/01/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1	**A27**		06/01/23 1955	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<6.25	6.25	mg/L	3	**Y**	06/05/23 1545	06/06/23 1740	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/01/23 2059	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/01/23 2059	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/01/23 2059	AMF
SM 4500-H+ B-2000								
pH	**7.57**		S.U.	1	**H1**		06/01/23 2059	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/02/23 1035	06/02/23 1450	DLO
Iron	<0.0500	0.0500	mg/L	1		06/02/23 1035	06/02/23 1450	DLO

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0197-09
Collected By: Customer
Collection Date: 06/01/2023 8:15

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1307	06/06/23 2109	DLO

Definitions

A27:	Headspace was present in the bottle used for the alkalinity analysis.
CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville
M-CT008 — Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/16/2023 14:16

D 3 F 0 1 9 7

MICROBAC®

NWSI - Northeast Water Solutions, Inc.

lb WO#: _____

lanager: _____

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	
GSF1- Effluent	6/1/23	8:00		X	dw	3	x	x	x							X		X			
GSF2- Effluent		8:05		X	dw	3	x	x	x							X		X			
GSF3 - Effluent		8:10		X	dw	3	x	x	x							X		X			
GSF-Effluent		8:15	X		dw	1				X						X					
GSF- Influent		8:15		X	dw	4	X	X	X	X						X		X			

PRESERVATIVE VERIFIED Initials

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/1/23	11:05
RECEIVED:	6/1/23	1105
RELINQUISHED:	6/1/23	1326
RECEIVED:	6/1/23	1326
RELINQUISHED:	6/1/23	1721
RECEIVED:	6/1/23	1721

TURNAROUND (INDICATE IN CALENDAR DAYS): _____ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS: _____

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 19.9 °C Upon Receipt at LAB 2.1 °C cf

MICROBAC®

Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0199

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/01/2023
Reported: 06/15/2023

Analytical Testing Parameters

Client Sample ID: HWWC - Raw
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-01
Collected By: Customer
Collection Date: 06/01/2023 9:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**2.61**	0.500	mg/L	1	**Y1**	06/02/23 1032	06/05/23 2232	IMM

Client Sample ID: HWWC - Raw
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-02
Collected By: Customer
Collection Date: 06/01/2023 9:00

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**2.75**	0.500	mg/L	1	**Y1**	06/02/23 1031	06/05/23 1206	IMM

Client Sample ID: Slow sand #1
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-03
Collected By: Customer
Collection Date: 06/01/2023 9:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**1.27**	0.500	mg/L	1	**Y1**	06/02/23 1032	06/05/23 2303	IMM

Client Sample ID: Slow sand #1
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-04
Collected By: Customer
Collection Date: 06/01/2023 9:00

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**1.35**	0.500	mg/L	1	**Y1**	06/02/23 1031	06/05/23 1238	IMM

Client Sample ID: Slow sand #2
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-05
Collected By: Customer
Collection Date: 06/01/2023 9:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**1.10**	0.500	mg/L	1	**Y1**	06/02/23 1032	06/05/23 2335	IMM

Client Sample ID:	Slow sand #2		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0199-06	**Collection Date:**	06/01/2023 9:00

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**1.14**	0.500	mg/L	1	**Y1**	06/02/23 1031	06/05/23 1340	IMM

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0199-07	**Collection Date:**	06/01/2023 9:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**1.13**	0.500	mg/L	1	**Y1**	06/02/23 1032	06/06/23 0006	IMM

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								
Benzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Bromobenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Bromochloromethane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Bromodichloromethane	**4.39**	0.50	ug/L	1			06/05/23 2045	IMM
Bromoform	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Methyl bromide	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
tert-Butylbenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
sec-Butylbenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
n-Butylbenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Carbon tetrachloride	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Chlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Chloroethane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Chloroform	**15.4**	0.50	ug/L	1			06/05/23 2045	IMM
Methyl chloride	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
2-Chlorotoluene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
4-Chlorotoluene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Chlorodibromomethane	**0.67**	0.50	ug/L	1			06/05/23 2045	IMM
Dibromomethane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,4-Dichlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,2-Dichlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,3-Dichlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Dichlorodifluoromethane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,2-Dichloroethane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,1-Dichloroethane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
trans-1,2-Dichloroethylene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
cis-1,2-Dichloroethylene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,1-Dichloroethene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,3-Dichloropropane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
2,2-Dichloropropane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,2-Dichloropropane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,1-Dichloropropene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
trans-1,3-Dichloropropylene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
cis-1,3-Dichloropropene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Ethylbenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Hexachlorobutadiene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Isopropylbenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
4-Isopropyltoluene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Methyl tert-butyl ether	<0.50	0.50	ug/L	1			06/05/23 2045	IMM

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-07
Collected By: Customer
Collection Date: 06/01/2023 9:10

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Methylene chloride	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Naphthalene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
n-Propylbenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Styrene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,1,1,2-Tetrachloroethane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,1,2,2-Tetrachloroethane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Tetrachloroethylene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Toluene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,2,4-Trichlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,2,3-Trichlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,1,1-Trichloroethane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,1,2-Trichloroethane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Trichloroethene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Trichlorofluoromethane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,2,3-Trichloropropane	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,2,4-Trimethylbenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
1,3,5-Trimethylbenzene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Vinyl chloride	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
m&p-xylene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
o-Xylene	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Xylenes (total)	<0.50	0.50	ug/L	1			06/05/23 2045	IMM
Surrogate: 4-Bromofluorobenzene	91.2	Limit: 70-130	% Rec	1			06/05/23 2045	IMM
Surrogate: 1,2-Dichlorobenzene-d4	89.8	Limit: 70-130	% Rec	1			06/05/23 2045	IMM

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-08
Collected By: Customer
Collection Date: 06/01/2023 9:10

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**1.15**	0.500	mg/L	1	**Y1**	06/02/23 1031	06/05/23 1443	IMM

Client Sample ID: GSF1-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-09
Collected By: Customer
Collection Date: 06/01/2023 9:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**1.12**	0.500	mg/L	1	**Y1**	06/02/23 1032	06/06/23 0037	IMM

Client Sample ID: GSF1-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-10
Collected By: Customer
Collection Date: 06/01/2023 9:10

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**1.14**	0.500	mg/L	1	**Y1**	06/02/23 1031	06/05/23 1514	IMM

Client Sample ID: GSF2-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-11
Collected By: Customer
Collection Date: 06/01/2023 9:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**1.11**	0.500	mg/L	1	**Y1**	06/02/23 1032	06/06/23 0108	IMM

Client Sample ID: GSF2-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-12
Collected By: Customer
Collection Date: 06/01/2023 9:10

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**1.15**	0.500	mg/L	1	**Y1**	06/02/23 1031	06/05/23 1545	IMM

Client Sample ID: GSF3-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-13
Collected By: Customer
Collection Date: 06/01/2023 9:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**1.11**	0.500	mg/L	1	**Y1**	06/02/23 1032	06/06/23 0139	IMM

Client Sample ID: GSF3-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0199-14
Collected By: Customer
Collection Date: 06/01/2023 9:10

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**1.13**	0.500	mg/L	1	**Y1**	06/02/23 1031	06/05/23 1617	IMM

Client Sample ID:	GSF-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0199-15	**Collection Date:**	06/01/2023 9:10

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								
Benzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Bromobenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Bromochloromethane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Bromodichloromethane	**4.40**	0.50	ug/L	1			06/05/23 2110	IMM
Bromoform	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Methyl bromide	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
tert-Butylbenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
sec-Butylbenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
n-Butylbenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Carbon tetrachloride	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Chlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Chloroethane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Chloroform	**15.1**	0.50	ug/L	1			06/05/23 2110	IMM
Methyl chloride	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
2-Chlorotoluene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
4-Chlorotoluene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Chlorodibromomethane	**0.67**	0.50	ug/L	1			06/05/23 2110	IMM
Dibromomethane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,4-Dichlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,2-Dichlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,3-Dichlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Dichlorodifluoromethane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,2-Dichloroethane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,1-Dichloroethane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
trans-1,2-Dichloroethylene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
cis-1,2-Dichloroethylene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,1-Dichloroethene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,3-Dichloropropane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
2,2-Dichloropropane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,2-Dichloropropane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,1-Dichloropropene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
trans-1,3-Dichloropropylene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
cis-1,3-Dichloropropene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Ethylbenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Hexachlorobutadiene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Isopropylbenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
4-Isopropyltoluene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Methyl tert-butyl ether	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Methylene chloride	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Naphthalene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
n-Propylbenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Styrene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM

CERTIFICATE OF ANALYSIS

D3F0199

Client Sample ID:	GSF-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0199-15	**Collection Date:**	06/01/2023 9:10

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
1,1,1,2-Tetrachloroethane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,1,2,2-Tetrachloroethane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Tetrachloroethylene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Toluene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,2,4-Trichlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,2,3-Trichlorobenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,1,1-Trichloroethane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,1,2-Trichloroethane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Trichloroethene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Trichlorofluoromethane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,2,3-Trichloropropane	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,2,4-Trimethylbenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
1,3,5-Trimethylbenzene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Vinyl chloride	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
m&p-xylene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
o-Xylene	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Xylenes (total)	<0.50	0.50	ug/L	1			06/05/23 2110	IMM
Surrogate: 4-Bromofluorobenzene	90.8	Limit: 70-130	% Rec	1			06/05/23 2110	IMM
Surrogate: 1,2-Dichlorobenzene-d4	89.6	Limit: 70-130	% Rec	1			06/05/23 2110	IMM

Definitions

MCL:	US EPA Maximum Contaminant Level
mg/L:	Milligrams per Liter
RL:	Reporting Limit
ug/L:	Micrograms per Liter
Y1:	Accreditation is not offered by the accrediting body for this analyte.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/15/2023 14:55

D 3 F 0 1 9 9

NWSI - Northeast Water Solutions, Inc.

MICROBAC®

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

WWW.Microbac.com

Lab WO#: _____

Project Manager: _____

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers			TOC	DOC	VOC					Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	H3P04
HWWC - RAW	6/1/23	9.00		X	dw	4			x	x						X					X
Slow sand #1		9.00		X	dw	4			X	X						X					X
Slow sand #2		9.00		X	dw	4			X	X						X					X
GSF-Influent		9.10		X	dw	6			X	X	X					X	X				X
GSF1-Effluent		9.10		X	dw	4			X	X						X					X
gsf2-effluent		9.10		X	dw	4			X	X						X					X
gsf3-effluent		9.10		X	dw	4			X	X						X					X
GSF-Effluent		9.10	X		dw	2					X						X				

CUSTODY TRANSFER (at drop off)		DATE	TIME
SAMPLER:		6/1/23	11.05
RECEIVED:	C Reynolds	6/1/23	1105
RELINQUISHED:	C Reynolds	6/1/23	1326
RECEIVED:			
RELINQUISHED:		6-1-23	1721
RECEIVED:		6/1/23	1721

TURNAROUND (INDICATE IN CALENDAR DAYS): _____ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS: _____

Cash Check# Auth#: _____

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 20.3C Upon Receipt at LAB

2.1 °C ok

MICROBAC®

Microbac Laboratories, Inc., Lee

CERTIFICATE OF ANALYSIS

E3F0006

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/01/2023
Reported: 06/06/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: E3F0006-01
Collected By: Sean Murphy
Collection Date: 06/01/2023 8:25

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.72**	1	S.U.	1		06/01/23 0825	06/02/23 0000	SUB
UV 254	**0.018**	0.001	abs/cm	1		06/01/23 0825	06/02/23 0000	SUB

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: E3F0006-02
Collected By: Sean Murphy
Collection Date: 06/01/2023 8:25

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.64**	1	S.U.	1		06/01/23 0825	06/02/23 0000	SUB
UV 254	**0.019**	0.001	abs/cm	1		06/01/23 0825	06/02/23 0000	SUB

Client Sample ID: HWWC-Raw
Sample Matrix: Drinking Water
Lab Sample ID: E3F0006-03
Collected By: Sean Murphy
Collection Date: 06/01/2023 8:20

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**8.15**	1	S.U.	1		06/01/23 0820	06/02/23 0000	SUB
UV 254	**0.051**	0.001	abs/cm	1		06/01/23 0820	06/02/23 0000	SUB

Client Sample ID: Slow Sand #1
Sample Matrix: Drinking Water
Lab Sample ID: E3F0006-04
Collected By: Sean Murphy
Collection Date: 06/01/2023 8:20

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.54**	1	S.U.	1		06/01/23 0820	06/02/23 0000	SUB
UV 254	**0.027**	0.001	abs/cm	1		06/01/23 0820	06/02/23 0000	SUB

CERTIFICATE OF ANALYSIS

E3F0006

Client Sample ID:	Slow Sand #2		
Sample Matrix:	Drinking Water	**Collected By:**	Sean Murphy
Lab Sample ID:	E3F0006-05	**Collection Date:**	06/01/2023 8:20

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.6**	1	S.U.	1		06/01/23 0820	06/02/23 0000	SUB
UV 254	**0.029**	0.001	abs/cm	1		06/01/23 0820	06/02/23 0000	SUB

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Sean Murphy
Lab Sample ID:	E3F0006-06	**Collection Date:**	06/01/2023 8:25

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.69**	1	S.U.	1		06/01/23 0825	06/02/23 0000	SUB
UV 254	**0.018**	0.001	abs/cm	1		06/01/23 0825	06/02/23 0000	SUB

Client Sample ID:	GSF3-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Sean Murphy
Lab Sample ID:	E3F0006-07	**Collection Date:**	06/01/2023 8:00

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.72**	1	S.U.	1		06/01/23 0800	06/02/23 0000	SUB
UV 254	**0.017**	0.001	abs/cm	1		06/01/23 0800	06/02/23 0000	SUB

Definitions

abs/cm:	Absorbance per Centimeter
MCL:	US EPA Maximum Contaminant Level
RL:	Reporting Limit
S.U.:	Standard Units

Project Requested Certification(s)

Phoenix Environmental Laboratories, Inc

PH-0618	Connecticut Department of Public Health
M-CT007	Massachusetts Department of Environmental Protection
63	Rhode Island Department of Health

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Christine F. Reynolds
Service Center Manager
Reported: 06/06/2023 08:20

CPR

MICROBAC®

Chain of Custody

E3F0006

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5(

WWW.Microbac.com

NWSI - Northeast Water Solutions, Inc.

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	COMPOSITE	GRAB	Sample Matrix	# of containers	UV254	Analysis						Non-pres	HCL	HNO3	NH4Cl	Sulfuric
GSF1- Effluent	6/1/23	8:25		X	dw	2	x							X				
GSF-Influent	↓	8:25		X	dw	2	x							x				
HWWC-Raw		8:20		X	dw	2	x							x				
Slow Sand #1		8:20		X	dw	2	X							x				
Slow Sand #2		8:20		X	dw	2	X							x				
GSF2-Effluent		8:25		X	dw	2	X							x				
GSF3-Effluent		8:25		X	dw	2	X							x				
~~TRIP BLANK~~ SM	↓	8:00		X	dw	2	X							X				

CUSTODY TRANSFER (at drop off)		DATE	TIME
SAMPLER:	S. M	6/1/23	11:05
RECEIVED:	CReynolds	6/1/23	11:05
RELINQUISHED:			
RECEIVED:			
RELINQUISHED:			
RECEIVED:			

TURNAROUND (INDICATE IN CALENDAR DAYS):

HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 19.3 °C Upon Receipt at LAB

PHOENIX
Environmental Laboratories, Inc.

Monday, June 05, 2023

Attn: Brayton Doar
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Project ID: **E3F0006**
SDG ID: **GCO18219**
Sample ID#s: **CO18219 - CO18225**

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

June 05, 2023

SDG I.D.: GCO18219

Project ID: E3F0006

Client Id	Lab Id	Matrix
E3F0006-01	CO18219	DRINKING WATER
E3F0006-02	CO18220	DRINKING WATER
E3F0006-03	CO18221	DRINKING WATER
E3F0006-04	CO18222	DRINKING WATER
E3F0006-05	CO18223	DRINKING WATER
E3F0006-06	CO18224	DRINKING WATER
E3F0006-07	CO18225	DRINKING WATER

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 05, 2023

FOR: Attn: Brayton Doar
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/01/23	8:25
Location Code:	MICROBAC-MA	Received by:	SW	06/02/23	10:29
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO18219
Phoenix ID: CO18219

Project ID: E3F0006
Client ID: E3F0006-01

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.72	1.00	1	pH Units			6.5-8.5	06/02/23 21:52	MW/KDB	SM4500-H B-11
UV-254 (Absorbance)	0.018	0.001	1	/cm				06/02/23 18:42	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
June 05, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 05, 2023

FOR: Attn: Brayton Doar
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/01/23	8:25
Location Code:	MICROBAC-MA	Received by:	SW	06/02/23	10:29
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO18219
Phoenix ID: CO18220

Project ID: E3F0006
Client ID: E3F0006-02

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.64	1.00	1	pH Units			6.5-8.5	06/02/23 21:55	MW/KDB	SM4500-H B-11
UV-254 (Absorbance)	0.019	0.001	1	/cm				06/02/23 18:45	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
June 05, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 05, 2023

FOR: Attn: Brayton Doar
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/01/23	8:20
Location Code:	MICROBAC-MA	Received by:	SW	06/02/23	10:29
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO18219
Phoenix ID: CO18221

Project ID: E3F0006
Client ID: E3F0006-03

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	8.15	1.00	1	pH Units			6.5-8.5	06/02/23 21:57	MW/KDB	SM4500-H B-11
UV-254 (Absorbance)	0.051	0.001	1	/cm				06/02/23 18:48	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
June 05, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 05, 2023

FOR: Attn: Brayton Doar
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/01/23	8:20
Location Code:	MICROBAC-MA	Received by:	SW	06/02/23	10:29
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO18219
Phoenix ID: CO18222

Project ID: E3F0006
Client ID: E3F0006-04

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.54	1.00	1	pH Units			6.5-8.5	06/02/23 21:59	MW/KDB	SM4500-H B-11
UV-254 (Absorbance)	0.027	0.001	1	/cm				06/02/23 18:50	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
June 05, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 05, 2023

FOR: Attn: Brayton Doar
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/01/23	8:20
Location Code:	MICROBAC-MA	Received by:	SW	06/02/23	10:29
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO18219
Phoenix ID: CO18223

Project ID: E3F0006
Client ID: E3F0006-05

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.60	1.00	1	pH Units			6.5-8.5	06/02/23 22:03	MW/KDB	SM4500-H B-11
UV-254 (Absorbance)	0.029	0.001	1	/cm				06/02/23 18:53	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
June 05, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 05, 2023

FOR: Attn: Brayton Doar
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/01/23	8:25
Location Code:	MICROBAC-MA	Received by:	SW	06/02/23	10:29
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO18219
Phoenix ID: CO18224

Project ID: E3F0006
Client ID: E3F0006-06

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.69	1.00	1	pH Units			6.5-8.5	06/02/23 22:06	MW/KDB	SM4500-H B-11
UV-254 (Absorbance)	0.018	0.001	1	/cm				06/02/23 18:56	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
June 05, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 05, 2023

FOR: Attn: Brayton Doar
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/01/23	8:00
Location Code:	MICROBAC-MA	Received by:	SW	06/02/23	10:29
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO18219
Phoenix ID: CO18225

Project ID: E3F0006
Client ID: E3F0006-07

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.72	1.00	1	pH Units			6.5-8.5	06/02/23 22:08	MW/KDB	SM4500-H B-11
UV-254 (Absorbance)	0.017	0.001	1	/cm				06/02/23 18:59	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
June 05, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

QA/QC Report

June 05, 2023

QA/QC Data

SDG I.D.: GCO18219

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 680646 (pH), QC Sample No: CO18318 (CO18219, CO18220, CO18221, CO18222, CO18223, CO18224, CO18225)													
pH			7.03	7.01	0.30	98.5						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 680598 (/cm), QC Sample No: CO18219 (CO18219, CO18220, CO18221, CO18222, CO18223, CO18224, CO18225)													
UV-254 (Absorbance)	BRL	0	0.018	0.017	5.70	96.4							

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
June 05, 2023

Monday, June 05, 2023

Criteria: MA: DW

State: MA

Sample Criteria Exceedances Report

GCO18219 - MICROBAC-MA

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Comments

June 05, 2023 SDG I.D.: GCO18219

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

Microbac Laboratories, Inc., Lee

MICROBAC®

SUBCONTRACTED CHAIN OF CUSTODY

E3F0006

6.9 wc 1plc

SENDING LABORATORY:	RECEIVING LABORATORY:
Microbac Laboratories, Inc., Lee 80 Run Way Lee, MA 01238 Phone: 413-776-5025 Lab Manager: Brayton Doar Email: Brayton.Doar@microbac.com	Phoenix Environmental Laboratories, Inc 587 E Middle TPKE PO BOX 370 Manchester, CT 06040 Phone: (860) 645-1102

Proiect Info:

PWSID:

Project Type: ENV-DrinkingWater
Project Location: Massachusetts

Report TAT: **7**
Due: **06/12/2023 17:00**

Project Requested Certifications

Massachusetts Department of Environmental Protection

Sample ID: E3F0006-01 18219
Matrix: Drinking Water
Loc ID:

Sampled: 06/01/2023 08:25
Description: GSF1 - Effluent

Sampler: Sean Murphy

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/12/2023 16:00	06/01/2023 08:39
UV254 SM5910-B	SM5910 B-2000	06/12/2023 16:00	06/03/2023 08:25

Sample iD: E3F0006-02
Matrix: Drinking Water 18220
Loc ID:

Sampled: 06/01/2023 08:25
Description: GSF - Influent

Sampler: Sean Murphy

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/12/2023 16:00	06/01/2023 08:39
UV254 SM5910-B	SM5910 B-2000	06/12/2023 16:00	06/03/2023 08:25

Sample ID: E3F0006-03
Matrix: Drinking Water 18221
Loc ID:

Sampled: 06/01/2023 08:20
Description: HWWC-Raw

Sampler: Sean Murphy

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/12/2023 16:00	06/01/2023 08:34
UV254 SM5910-B	SM5910 B-2000	06/12/2023 16:00	06/03/2023 08:20

Sample ID: E3F0006-04 ✓
Matrix: Drinking Water
Loc ID: 18222

Sampled: 06/01/2023 08:20
Description: Slow Sand #1

Sampler: Sean Murphy

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/12/2023 16:00	06/01/2023 08:34
UV254 SM5910-B	SM5910 B-2000	06/12/2023 16:00	06/03/2023 08:20

Microbac Laboratories, Inc., Lee

MICROBAC®

SUBCONTRACTED CHAIN OF CUSTODY

E3F0006

Project Requested Certifications
Massachusetts Department of Environmental Protection

Sample ID: E3F0006-05 **Sampled: 06/01/2023 08:20** Sampler: Sean Murphy
Matrix: Drinking Water 18223 Description: Slow Sand #2
Loc ID:

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/12/2023 16:00	06/01/2023 08:34
UV254 SM5910-B	SM5910 B-2000	06/12/2023 16:00	06/03/2023 08:20

Sample ID: E3F0006-06 **Sampled: 06/01/2023 08:25** Sampler: Sean Murphy
Matrix: Drinking Water Description: GSF2 - Effluent
Loc ID: 18224

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/12/2023 16:00	06/01/2023 08:39
UV254 SM5910-B	SM5910 B-2000	06/12/2023 16:00	06/03/2023 08:25

Sample ID: E3F0006-07 **Sampled: 06/01/2023 08:00** Sampler: Sean Murphy
Matrix: Drinking Water Description: GSF3-Effluent
Loc ID: 18225

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/12/2023 16:00	06/01/2023 08:14
UV254 SM5910-B	SM5910 B-2000	06/12/2023 16:00	06/03/2023 08:00

60 mL
2- Amb vials each

one vial for -04 received shattered

Released By	Date	Received By	Date
[signature]	6.1.23	[signature]	6/2 1024
Released By	Date	Received By	Date

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0201

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/01/2023
Reported: 06/08/2023

Analytical Testing Parameters

Client Sample ID: GSF - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0201-01
Collected By: Customer
Collection Date: 06/01/2023 8:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Hach Test Kit, DOC326.98.00004								
Carbon dioxide	**16.0**	1.20	mg/L	1	**Y**		06/01/23 2016	CEO
SM 2510 B-1997								
Conductivity (at 25°C)	**221**	1.00	umhos/cm	1	**Y**		06/02/23 2023	AMF
SM 2540 C-1997								
Total Dissolved Solids (TDS)	**98.0**	25.0	mg/L	10		06/02/23 1955	06/06/23 1830	AJD
SM 4500-NO_3^- F-2000								
Nitrate as N	**0.202**	0.0500	mg/L	1			06/01/23 2004	AJW
Nitrite as N	<0.0100	0.0100	mg/L	1			06/01/23 2004	AJW
SM 4500-SO_4^- E-1997								
Sulfate	**5.01**	5.00	mg/L	1			06/01/23 1853	CLW

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/01/23 2059	AMF

Metals Total by CVAA	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 245.1, Rv. 3 (1994)								
Mercury	<0.00020	0.00020	mg/L	1		06/07/23 1300	06/07/23 1448	GEE

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Calcium	**21.4**	0.0500	mg/L	1		06/02/23 1035	06/02/23 1454	DLO
Magnesium	**8.90**	0.0510	mg/L	1	**Y1**	06/02/23 1035	06/02/23 1454	DLO
Potassium	**0.542**	0.204	mg/L	1	**Y1**	06/02/23 1035	06/02/23 1454	DLO
Sodium	**7.65**	1.02	mg/L	1		06/02/23 1035	06/02/23 1454	DLO

Metals Total by ICPMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.8, Rv. 5.4 (1994)								
Aluminum	<0.0100	0.0100	mg/L	1		06/02/23 1042	06/02/23 1251	MMC
Arsenic	<0.0040	0.0040	mg/L	1		06/02/23 1042	06/02/23 1251	MMC
Beryllium	<0.0010	0.0010	mg/L	1		06/02/23 1042	06/02/23 1251	MMC
Cadmium	<0.0010	0.0010	mg/L	1		06/02/23 1042	06/02/23 1251	MMC
Chromium	<0.0010	0.0010	mg/L	1		06/02/23 1042	06/02/23 1251	MMC
Copper	**0.0101**	0.0010	mg/L	1		06/02/23 1042	06/02/23 1251	MMC
Lead	<0.0010	0.0010	mg/L	1		06/02/23 1042	06/02/23 1251	MMC
Zinc	**0.0456**	0.0050	mg/L	1		06/02/23 1042	06/02/23 1251	MMC

CERTIFICATE OF ANALYSIS

D3F0201

Client Sample ID:	GSF - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0201-01	**Collection Date:**	06/01/2023 8:30

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								
Total Trihalomethanes	**18.1**	0.500	ug/L	1			06/02/23 2036	IMM
Bromodichloromethane	**3.44**	0.500	ug/L	1			06/02/23 2036	IMM
Bromoform	<0.500	0.500	ug/L	1			06/02/23 2036	IMM
Chloroform	**14.1**	0.500	ug/L	1			06/02/23 2036	IMM
Chlorodibromomethane	**0.540**	0.500	ug/L	1			06/02/23 2036	IMM
Surrogate: 4-Bromofluorobenzene	105	Limit: 70-130	% Rec	1			06/02/23 2036	IMM
Surrogate: 1,2-Dichlorobenzene-d4	104	Limit: 70-130	% Rec	1			06/02/23 2036	IMM

Semivolatile Organic Compounds by GC/ECD	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 552.2, Rv. 1 (1995)								
Total Haloacetic acids (HAA5)	**18.5**	1.00	ug/L	1		06/06/23 1255	06/07/23 0427	ALG
Chloroacetic acid	<1.00	1.00	ug/L	1		06/06/23 1255	06/07/23 0427	ALG
Bromoacetic acid	<1.00	1.00	ug/L	1		06/06/23 1255	06/07/23 0427	ALG
Dichloroacetic acid [2C]	**8.49**	1.00	ug/L	1		06/06/23 1255	06/07/23 0427	ALG
Trichloroacetic acid [2C]	**10.1**	1.00	ug/L	1		06/06/23 1255	06/07/23 0427	ALG
Dibromoacetic acid [2C]	<1.00	1.00	ug/L	1		06/06/23 1255	06/07/23 0427	ALG
Surrogate: 2,3-Dibromopropionic acid	81.1	Limit: 70-130	% Rec	1		06/06/23 1255	06/07/23 0427	ALG
Surrogate: 2,3-Dibromopropionic acid [2C]	87.8	Limit: 70-130	% Rec	1		06/06/23 1255	06/07/23 0427	ALG

Anions by IC	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 300.0, Rv. 2.1 (1993)								
Chloride	**11.6**	1.00	mg/L	1			06/05/23 2103	IMM

Client Sample ID:	Slow Sand #1		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0201-02	**Collection Date:**	06/01/2023 8:45

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								
Total Trihalomethanes	<0.500	0.500	ug/L	1			06/06/23 1316	ADF
Bromodichloromethane	<0.500	0.500	ug/L	1			06/06/23 1316	ADF
Bromoform	<0.500	0.500	ug/L	1			06/06/23 1316	ADF
Chloroform	<0.500	0.500	ug/L	1			06/06/23 1316	ADF
Chlorodibromomethane	<0.500	0.500	ug/L	1			06/06/23 1316	ADF
Surrogate: 4-Bromofluorobenzene	96.4	Limit: 70-130	% Rec	1			06/06/23 1316	ADF
Surrogate: 1,2-Dichlorobenzene-d4	95.0	Limit: 70-130	% Rec	1			06/06/23 1316	ADF

Semivolatile Organic Compounds by GC/ECD	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 552.2, Rv. 1 (1995)								
Total Haloacetic acids (HAA5)	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2202	ALG
Chloroacetic acid	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2202	ALG
Bromoacetic acid	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2202	ALG
Dichloroacetic acid	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2202	ALG
Trichloroacetic acid	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2202	ALG
Dibromoacetic acid	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2202	ALG
Surrogate: 2,3-Dibromopropionic acid	76.9	Limit: 70-130	% Rec	1		06/07/23 1210	06/07/23 2202	ALG
Surrogate: 2,3-Dibromopropionic acid [2C]	85.1	Limit: 70-130	% Rec	1		06/07/23 1210	06/07/23 2202	ALG

Client Sample ID:	Slow Sand #2		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0201-03	**Collection Date:**	06/01/2023 8:45

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								
Total Trihalomethanes	<0.500	0.500	ug/L	1			06/06/23 1340	ADF
Bromodichloromethane	<0.500	0.500	ug/L	1			06/06/23 1340	ADF
Bromoform	<0.500	0.500	ug/L	1			06/06/23 1340	ADF
Chloroform	<0.500	0.500	ug/L	1			06/06/23 1340	ADF
Chlorodibromomethane	<0.500	0.500	ug/L	1			06/06/23 1340	ADF
Surrogate: 4-Bromofluorobenzene	95.4	Limit: 70-130	% Rec	1			06/06/23 1340	ADF
Surrogate: 1,2-Dichlorobenzene-d4	105	Limit: 70-130	% Rec	1			06/06/23 1340	ADF

Semivolatile Organic Compounds by GC/ECD	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 552.2, Rv. 1 (1995)								
Total Haloacetic acids (HAA5)	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2224	ALG
Chloroacetic acid [2C]	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2224	ALG
Bromoacetic acid [2C]	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2224	ALG
Dichloroacetic acid	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2224	ALG
Trichloroacetic acid	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2224	ALG
Dibromoacetic acid	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2224	ALG
Surrogate: 2,3-Dibromopropionic acid	80.5	Limit: 70-130	% Rec	1		06/07/23 1210	06/07/23 2224	ALG
Surrogate: 2,3-Dibromopropionic acid [2C]	87.4	Limit: 70-130	% Rec	1		06/07/23 1210	06/07/23 2224	ALG

CERTIFICATE OF ANALYSIS

D3F0201

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0201-04	**Collection Date:**	06/01/2023 8:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Hach Test Kit, DOC326.98.00004								
Carbon dioxide	**10.0**	1.20	mg/L	1	**Y**		06/01/23 2016	CEO
SM 2510 B-1997								
Conductivity (at 25°C)	**221**	1.00	umhos/cm	1	**Y**		06/02/23 2023	AMF
SM 2540 C-1997								
Total Dissolved Solids (TDS)	**107**	25.0	mg/L	10		06/02/23 1955	06/06/23 1830	AJD
SM 4500-NO_3^- F-2000								
Nitrate as N	**0.201**	0.0500	mg/L	1			06/01/23 2005	AJW
Nitrite as N	<0.0100	0.0100	mg/L	1			06/01/23 2005	AJW
SM 4500-SO_4^- E-1997								
Sulfate	<5.00	5.00	mg/L	1			06/01/23 1854	CLW

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/01/23 2059	AMF

Metals Total by CVAA	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 245.1, Rv. 3 (1994)								
Mercury	<0.00020	0.00020	mg/L	1		06/07/23 1300	06/07/23 1450	GEE

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Calcium	**21.6**	0.0500	mg/L	1		06/02/23 1035	06/02/23 1457	DLO
Magnesium	**8.99**	0.0510	mg/L	1	**Y1**	06/02/23 1035	06/02/23 1457	DLO
Potassium	**0.562**	0.204	mg/L	1	**Y1**	06/02/23 1035	06/02/23 1457	DLO
Sodium	**7.68**	1.02	mg/L	1		06/02/23 1035	06/02/23 1457	DLO

Metals Total by ICPMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.8, Rv. 5.4 (1994)								
Aluminum	<0.0100	0.0100	mg/L	1		06/02/23 1042	06/02/23 1253	MMC
Arsenic	<0.0040	0.0040	mg/L	1		06/02/23 1042	06/02/23 1253	MMC
Beryllium	<0.0010	0.0010	mg/L	1		06/02/23 1042	06/02/23 1253	MMC
Cadmium	<0.0010	0.0010	mg/L	1		06/02/23 1042	06/02/23 1253	MMC
Chromium	<0.0010	0.0010	mg/L	1		06/02/23 1042	06/02/23 1253	MMC
Copper	**0.0108**	0.0010	mg/L	1		06/02/23 1042	06/02/23 1253	MMC
Lead	<0.0010	0.0010	mg/L	1		06/02/23 1042	06/02/23 1253	MMC
Zinc	**0.0159**	0.0050	mg/L	1		06/02/23 1042	06/02/23 1253	MMC

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								
Total Trihalomethanes	**22.4**	0.500	ug/L	1			06/06/23 1404	ADF
Bromodichloromethane	**4.31**	0.500	ug/L	1			06/06/23 1404	ADF

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0201-04	**Collection Date:**	06/01/2023 8:30

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Bromoform	<0.500	0.500	ug/L	1			06/06/23 1404	ADF
Chloroform	**17.4**	0.500	ug/L	1			06/06/23 1404	ADF
Chlorodibromomethane	**0.670**	0.500	ug/L	1			06/06/23 1404	ADF
Surrogate: 4-Bromofluorobenzene	96.4	Limit: 70-130	% Rec	1			06/06/23 1404	ADF
Surrogate: 1,2-Dichlorobenzene-d4	102	Limit: 70-130	% Rec	1			06/06/23 1404	ADF

Semivolatile Organic Compounds by GC/ECD	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 552.2, Rv. 1 (1995)								
Total Haloacetic acids (HAA5)	**17.3**	1.00	ug/L	1		06/07/23 1210	06/07/23 2247	ALG
Chloroacetic acid	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2247	ALG
Bromoacetic acid	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2247	ALG
Dichloroacetic acid [2C]	**7.81**	1.00	ug/L	1		06/07/23 1210	06/07/23 2247	ALG
Trichloroacetic acid [2C]	**9.52**	1.00	ug/L	1		06/07/23 1210	06/07/23 2247	ALG
Dibromoacetic acid [2C]	<1.00	1.00	ug/L	1		06/07/23 1210	06/07/23 2247	ALG
Surrogate: 2,3-Dibromopropionic acid	76.9	Limit: 70-130	% Rec	1		06/07/23 1210	06/07/23 2247	ALG
Surrogate: 2,3-Dibromopropionic acid [2C]	86.0	Limit: 70-130	% Rec	1		06/07/23 1210	06/07/23 2247	ALG

Anions by IC	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 300.0, Rv. 2.1 (1993)								
Chloride	**11.5**	1.00	mg/L	1			06/05/23 2118	IMM

Definitions

AL:	US EPA Action Level
MCL:	US EPA Maximum Contaminant Level
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
ug/L:	Micrograms per Liter
umhos/cm:	Umhos per Centimeter
Y:	This analyte is not on the laboratory's current scope of accreditation.
Y1:	Accreditation is not offered by the accrediting body for this analyte.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008 — Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/08/2023 16:24

D 3 F 0 2 0 1

MICROBAC

NWSI - Northeast Water Solutions, Inc.

ab WO#: _____

Manager: _____

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-50

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	THM/HAA	Analysis: TDS, Con, Cl, NO2, NO3, SO4	Analysis: CO2	Analysis: Al, Na, Zn, Ca, Mg, K	Analysis: Heavy Meta Metals	Analysis	Analysis	Preservatives: Non-pres	Preservatives: HCL	Preservatives: HNO3	Preservatives: NH4Cl	Preservatives: NH4Cl/NaThic
GSF Effluent	6/1/23	9:30	X		dw	8	x	x	x	x	X			x		x		X
Slow Sand #1		9:45		X	dw	4	X											X
Slow Sand #2		9:45		X	dw	4	X											X
GSF-Influent		9:30		X	dw	8	X	X	X	X	X			X		X		X
TRIP BLANK	N/A																	

PRESERVATIVE VERIFIED Initials

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/1/23	11:05
RECEIVED:	6/1/23	11:05
RELINQUISHED:	6/1/23	1326
RECEIVED:	6/1/23	1326
RELINQUISHED:	6/1/23	1721
RECEIVED:	6/1/23	1721

TURNAROUND (INDICATE IN CALENDAR DAYS): _____ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS: _____

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 19.4 °C Upon Receipt at LAB

2.1 ice wt

MICROBAC®

Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0323

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/02/2023
Reported: 06/08/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0323-01
Collected By: Customer
Collection Date: 06/02/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/05/23 1545	06/06/23 1740	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/02/23 1947	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/02/23 1947	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/02/23 1947	AMF
SM 4500-H+ B-2000								
pH	**7.32**		S.U.	1	**H1**		06/02/23 1947	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/05/23 1203	06/05/23 1511	DLO
Iron	<0.0500	0.0500	mg/L	1		06/05/23 1203	06/05/23 1511	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0323-02
Collected By: Customer
Collection Date: 06/02/2023 8:15

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1309	06/06/23 2229	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0323-03	**Collection Date:**	06/02/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/05/23 1545	06/06/23 1740	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/02/23 1947	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/02/23 1947	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/02/23 1947	AMF
SM 4500-H+ B-2000								
pH	**7.56**		S.U.	1	**H1**		06/02/23 1947	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/05/23 1203	06/05/23 1522	DLO
Iron	<0.0500	0.0500	mg/L	1		06/05/23 1203	06/05/23 1522	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0323-04	**Collection Date:**	06/02/2023 8:15

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1309	06/06/23 2233	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0323-05	**Collection Date:**	06/02/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/05/23 1545	06/06/23 1740	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/02/23 1947	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/02/23 1947	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/02/23 1947	AMF
SM 4500-H+ B-2000								
pH	**7.52**		S.U.	1	**H1**		06/02/23 1947	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/05/23 1203	06/05/23 1526	DLO
Iron	<0.0500	0.0500	mg/L	1		06/05/23 1203	06/05/23 1526	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0323-06	**Collection Date:**	06/02/2023 8:15

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1309	06/06/23 2236	DLO

Client Sample ID:	GSF - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0323-07	**Collection Date:**	06/02/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/06/23 1525	EMK

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0323-08
Collected By: Customer
Collection Date: 06/02/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/06/23 1525	EMK
SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/05/23 1545	06/06/23 1740	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/02/23 1947	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/02/23 1947	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/02/23 1947	AMF
SM 4500-H+ B-2000								
pH	**7.61**		S.U.	1	**H1**		06/02/23 1947	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00799**	0.00204	mg/L	1		06/05/23 1203	06/05/23 1530	DLO
Iron	<0.0500	0.0500	mg/L	1		06/05/23 1203	06/05/23 1530	DLO

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0323-09
Collected By: Customer
Collection Date: 06/02/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1309	06/06/23 2247	DLO

Client Sample ID: Slow Sand #1
Sample Matrix: Drinking Water
Lab Sample ID: D3F0323-10
Collected By: Customer
Collection Date: 06/02/2023 8:10

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00470**	0.00204	mg/L	1		06/05/23 1203	06/05/23 1533	DLO
Iron	<0.0500	0.0500	mg/L	1		06/05/23 1203	06/05/23 1533	DLO

Client Sample ID: Slow Sand #1
Sample Matrix: Drinking Water
Lab Sample ID: D3F0323-11
Collected By: Customer
Collection Date: 06/02/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00431**	0.00204	mg/L	1		06/06/23 1309	06/06/23 2251	DLO

Client Sample ID: Slow Sand #2
Sample Matrix: Drinking Water
Lab Sample ID: D3F0323-12
Collected By: Customer
Collection Date: 06/02/2023 8:10

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/05/23 1203	06/05/23 1545	DLO
Iron	<0.0500	0.0500	mg/L	1		06/05/23 1203	06/05/23 1545	DLO

Client Sample ID: Slow Sand #2
Sample Matrix: Drinking Water
Lab Sample ID: D3F0323-13
Collected By: Customer
Collection Date: 06/02/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1309	06/06/23 2255	DLO

Client Sample ID: HWWC-Raw
Sample Matrix: Drinking Water
Lab Sample ID: D3F0323-14
Collected By: Customer
Collection Date: 06/02/2023 8:10

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.0292**	0.00204	mg/L	1		06/05/23 1203	06/05/23 1548	DLO
Iron	<0.0500	0.0500	mg/L	1		06/05/23 1203	06/05/23 1548	DLO

Client Sample ID: HWWC-Raw
Sample Matrix: Drinking Water
Lab Sample ID: D3F0323-15
Collected By: Customer
Collection Date: 06/02/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00312**	0.00204	mg/L	1		06/06/23 1309	06/06/23 2258	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Ronald L. Warila
Director
Reported: 06/08/2023 15:16

D 3 F 0 3 2 3

NWSI - Northeast Water Solutions, Inc.

BNO

MICROBAC

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

WWW.Microbac.com

Lab WO#:

Project Manager:

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	
GSF1- Effluent	6/2/23	8:15		X	dw	3	x	x	x							X		X			
GSF2- Effluent		8:15		X	dw	3	x	x	x							X		X			
GSF3 - Effluent		8:15		X	dw	3	x	x	x							X		X			
GSF-Effluent		8:15	X		dw	1				X						X		X			
GSF- Influent		8:16		X	dw	4	X	X	X	X						X		X			
Slow Sand #1		8:10		X	dw	2		X	X							X		X			
Slow Sand #2		8:10		X	dw	2		X	x							X		X			
HWWC - Raw		8:10		X	dw	2		X	X							X		X			

PRESERVATIVE VERIFIED Initials

TURNAROUND (INDICATE IN CALENDAR DAYS):

HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/2/23	9:45
RECEIVED:	6-2-23	9:45
RELINQUISHED:	6-2-23	1258
RECEIVED:	6-2-23	1258
RELINQUISHED:	6-2-23	1616
RECEIVED:	6-2-23	1616

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 21.1 °C Upon Receipt at LAB

2.4 OC

Page 7 of 7

MICROBAC®

Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0400

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/05/2023
Reported: 06/13/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0400-01
Collected By: Customer
Collection Date: 06/04/2023 16:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/06/23 1740	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/05/23 2030	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/05/23 2030	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/05/23 2030	EMK
SM 4500-H+ B-2000								
pH	**7.31**		S.U.	1	**H1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00255**	0.00200	mg/L	1	**R3**	06/07/23 1500	06/08/23 1213	DLO
Iron	<0.0500	0.0500	mg/L	1		06/07/23 1500	06/08/23 1213	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0400-02
Collected By: Customer
Collection Date: 06/04/2023 16:30

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1153	06/07/23 1628	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0400-03	**Collection Date:**	06/04/2023 16:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/06/23 1740	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/05/23 2030	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/05/23 2030	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/05/23 2030	EMK
SM 4500-H+ B-2000								
pH	**7.60**		S.U.	1	**H1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1300	06/06/23 1613	DLO
Iron	<0.0500	0.0500	mg/L	1		06/06/23 1300	06/06/23 1613	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0400-04	**Collection Date:**	06/04/2023 16:30

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1153	06/07/23 1639	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0400-05	**Collection Date:**	06/04/2023 16:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/06/23 1740	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/05/23 2030	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/05/23 2030	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/05/23 2030	EMK
SM 4500-H+ B-2000								
pH	**7.58**		S.U.	1	**H1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1300	06/06/23 1617	DLO
Iron	<0.0500	0.0500	mg/L	1		06/06/23 1300	06/06/23 1617	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0400-06	**Collection Date:**	06/04/2023 16:30

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/09/23 1149	06/09/23 1334	DLO

Client Sample ID:	GSF-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0400-07	**Collection Date:**	06/04/2023 16:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**85.0**	1.00	mg CaCO3/L	1			06/07/23 1610	EMK

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0400-08
Collected By: Customer
Collection Date: 06/04/2023 16:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/07/23 1610	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/06/23 1740	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/05/23 2030	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/05/23 2030	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/05/23 2030	EMK
SM 4500-H+ B-2000								
pH	**7.32**		S.U.	1	**H1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.0121**	0.00204	mg/L	1		06/06/23 1300	06/06/23 1621	DLO
Iron	<0.0500	0.0500	mg/L	1		06/06/23 1300	06/06/23 1621	DLO

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0400-09
Collected By: Customer
Collection Date: 06/04/2023 16:30

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/09/23 1149	06/09/23 1338	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
R3:	Duplicate RPD is outside of acceptance criteria. The difference between the results is less than 2x Method Reporting Limit.
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville
M-CT008 — Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

M Montgomery

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/13/2023 17:10

D 3 F 0 4 0 0

NWSI - Northeast Water Solutions, Inc.

BNO

MICROBAC

Chain of Custody

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

WWW.Microbac.com

Project Manager: _____

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	
GSF1- Effluent	6/4/23	1300hr		X	dw	3	x	x	x							X		X			
GSF2- Effluent				X	dw	3	x	x	x							X		X			
GSF3 - Effluent				X	dw	3	x	x	x							X		X			
GSF-Effluent			X		dw	1				X						X					
GSF- Influent				X	dw	4	X	X	X	X						X		X			

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/5/23	10:00
RECEIVED:	6-5-23	1000
RELINQUISHED:		
RECEIVED:	6-6-23	1145
RELINQUISHED:	6-6-23	1450
RECEIVED:	6/15/23	1450

PRESERVATIVE VERIFIED Initials _____

TURNAROUND (INDICATE IN CALENDAR DAYS): _____ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS: _____

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☒ COOLED ☐ AMBIENT 13.7 °C Upon Receipt at LAB

3.7 lo

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0399

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/05/2023
Reported: 06/09/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0399-01
Collected By: Customer
Collection Date: 06/05/2023 8:40

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/06/23 1740	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/05/23 2030	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/05/23 2030	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/05/23 2030	EMK
SM 4500-H+ B-2000								
pH	**7.38**		S.U.	1	**H1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1300	06/06/23 1552	DLO
Iron	<0.0500	0.0500	mg/L	1		06/06/23 1300	06/06/23 1552	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0399-02
Collected By: Customer
Collection Date: 06/05/2023 8:40

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1153	06/07/23 1614	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0399-03	**Collection Date:**	06/05/2023 8:40

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/06/23 1740	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/05/23 2030	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/05/23 2030	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/05/23 2030	EMK
SM 4500-H+ B-2000								
pH	**7.30**		S.U.	1	**H1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/06/23 1300	06/06/23 1555	DLO
Iron	<0.0500	0.0500	mg/L	1		06/06/23 1300	06/06/23 1555	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0399-04	**Collection Date:**	06/05/2023 8:40

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1153	06/07/23 1617	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0399-05	**Collection Date:**	06/05/2023 8:40

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<6.25	6.25	mg/L	3	**Y**	06/06/23 1740	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/05/23 2030	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/05/23 2030	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/05/23 2030	EMK
SM 4500-H+ B-2000								
pH	**7.33**		S.U.	1	**H1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00262**	0.00204	mg/L	1		06/06/23 1300	06/06/23 1559	DLO
Iron	<0.0500	0.0500	mg/L	1		06/06/23 1300	06/06/23 1559	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0399-06	**Collection Date:**	06/05/2023 8:40

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1153	06/07/23 1621	DLO

Client Sample ID:	GSF-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0399-07	**Collection Date:**	06/05/2023 8:40

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**85.0**	1.00	mg CaCO3/L	1			06/07/23 1610	EMK

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0399-08
Collected By: Customer
Collection Date: 06/05/2023 8:40

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**85.0**	1.00	mg CaCO3/L	1			06/07/23 1610	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/06/23 1740	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/05/23 2030	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/05/23 2030	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/05/23 2030	EMK
SM 4500-H+ B-2000								
pH	**7.30**		S.U.	1	**H1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.0110**	0.00204	mg/L	1		06/06/23 1300	06/06/23 1610	DLO
Iron	<0.0500	0.0500	mg/L	1		06/06/23 1300	06/06/23 1610	DLO

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0399-09
Collected By: Customer
Collection Date: 06/05/2023 8:40

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1153	06/07/23 1625	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville
M-CT008 Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/09/2023 16:56

MICROBAC

Chain of Custody

D 3 F 0 3 9 9

NWSI - Northeast Water Solutions, inc.

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

WWW.Microbac.com

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	
GSF1- Effluent	6/5/23	8:40		X	dw	3	x	x	x							X		X			
GSF2- Effluent				X	dw	3	x	x	x							X		X			
GSF3 - Effluent				X	dw	3	x	x	x							X		X			
GSF-Effluent			X		dw	1				X						X		X			
GSF- Influent				X	dw	4	X	X	X	X						X		X			

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/5/23	10:00
RECEIVED:	6/5/23	10:00
RELINQUISHED:		
RECEIVED:	6/6/23	1145
RELINQUISHED:	6/6/23	1400
RECEIVED:	6/6/23	1450

PRESERVATIVE VERIFIED Initials

TURNAROUND (INDICATE IN CALENDAR DAYS):

HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☑ COOLED ☐ AMBIENT 20.1 °C Upon Receipt at LAB

3.9 (10)

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0398

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/05/2023
Reported: 06/08/2023

Analytical Testing Parameters

Client Sample ID: GSF3 Backwash 2 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0398-01
Collected By: Customer
Collection Date: 06/05/2023 7:40

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-2015								
Total Suspended Solids (TSS)	**34.0**	10.0	mg/L	4		06/06/23 1640	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**73.2**	0.100	NTU	1	**Y1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**8.76**	0.00200	mg/L	1		06/06/23 1500	06/07/23 1734	DLO

Client Sample ID: GSF3 Backwash 4 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0398-02
Collected By: Customer
Collection Date: 06/05/2023 7:42

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-2015								
Total Suspended Solids (TSS)	**6.60**	5.00	mg/L	2		06/06/23 1640	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**35.1**	0.100	NTU	1	**Y1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**2.14**	0.00200	mg/L	1		06/06/23 1500	06/07/23 1738	DLO

Client Sample ID: GSF3 Backwash 6 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0398-03
Collected By: Customer
Collection Date: 06/05/2023 7:44

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-2015								
Total Suspended Solids (TSS)	**6.20**	5.00	mg/L	2		06/06/23 1640	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**36.3**	0.100	NTU	1	**Y1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**2.14**	0.00200	mg/L	1		06/06/23 1500	06/07/23 1741	DLO

Client Sample ID: GSF3 Backwash 8 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0398-04
Collected By: Customer
Collection Date: 06/05/2023 7:46

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-2015								
Total Suspended Solids (TSS)	**6.22**	2.78	mg/L	1		06/06/23 1640	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**31.0**	0.100	NTU	1	**Y1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.88**	0.00200	mg/L	1		06/06/23 1500	06/07/23 1745	DLO

Client Sample ID: GSF3 Backwash 10 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0398-05
Collected By: Customer
Collection Date: 06/05/2023 7:48

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.44**	2.78	mg/L	1		06/06/23 1640	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**27.8**	0.100	NTU	1	**Y1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.48**	0.00200	mg/L	1		06/06/23 1500	06/07/23 1756	DLO

Client Sample ID: GSF3 Backwash 12 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0398-06
Collected By: Customer
Collection Date: 06/05/2023 7:50

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.44**	2.78	mg/L	1		06/06/23 1640	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**25.7**	0.100	NTU	1	**Y1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.25**	0.00200	mg/L	1		06/06/23 1500	06/07/23 1759	DLO

Client Sample ID: GSF3 Backwash 14 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0398-07
Collected By: Customer
Collection Date: 06/05/2023 7:52

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.33**	2.78	mg/L	1		06/06/23 1640	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**25.4**	0.100	NTU	1	**Y1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.25**	0.00200	mg/L	1		06/06/23 1500	06/07/23 1803	DLO

Client Sample ID: GSF3 Backwash 16 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0398-08
Collected By: Customer
Collection Date: 06/05/2023 7:54

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.11**	2.78	mg/L	1		06/06/23 1640	06/07/23 1640	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**24.6**	0.100	NTU	1	**Y1**		06/05/23 2030	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.30**	0.00200	mg/L	1		06/06/23 1500	06/07/23 1807	DLO

Client Sample ID: GSF3 Backwash 18 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0398-09
Collected By: Customer
Collection Date: 06/05/2023 7:56

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.22**	2.78	mg/L	1		06/06/23 1640	06/07/23 1640	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**23.3**	0.100	NTU	1	**Y1**		06/05/23 2030	EMK
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.20**	0.00200	mg/L	1		06/06/23 1500	06/07/23 1818	DLO

Client Sample ID: GSF3 Backwash 20 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0398-10
Collected By: Customer
Collection Date: 06/05/2023 7:58

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-2015								
Total Suspended Solids (TSS)	**3.33**	2.78	mg/L	1		06/06/23 1640	06/07/23 1640	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**23.6**	0.100	NTU	1	**Y1**		06/05/23 2030	EMK
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.13**	0.00200	mg/L	1		06/06/23 1500	06/07/23 1822	DLO

Client Sample ID: GSF3 Backwash 22 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0398-11
Collected By: Customer
Collection Date: 06/05/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2540 D-2015								
Total Suspended Solids (TSS)	**3.66**	2.78	mg/L	1		06/06/23 1640	06/07/23 1640	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**23.4**	0.100	NTU	1	**Y1**		06/05/23 2030	EMK
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.17**	0.00200	mg/L	1		06/06/23 1500	06/07/23 1825	DLO

Definitions

MCL:	US EPA Maximum Contaminant Level
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
Y1:	Accreditation is not offered by the accrediting body for this analyte.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/08/2023 16:25

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Chain of Custody

D 3 F 0 3 9 8

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5(

WWW.Microbac.com

NWSI - Northeast Water Solutions, Inc.

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	Total Mn	Analysis: TSS, Turbidity	Preservatives: Non-pres	Preservatives: HCL	Preservatives: HNO3	Preservatives: NH4Cl	Preservatives: Sulfuric
GSF3 Backwash 2 min.	6/5/23	7:40		X	aq	2	X	X	X		X		
GSF3 Backwash 4 Min		7:42		X	aq	2	X	X	X		X		
GSF3 Backwash 6 Min.		7:44		X	aq	2	X	X	X		X		
GSF3 Backwash 8 Min		7:46		X	aq	2	X	X	X		X		
GSF3 Backwash 10 min		7:48		X	aq	2	X	X	X		X		
GSF3 Backwash 12 Min		7:50		X	aq	2	X	X	X		X		
GSF3 Backwash 14 min		7:52		X	aq	2	X	X	X		X		
GSF3 Backwash 16 min		7:54		X	aq	2	X	X	X		X		
GSF3 Backwash 18 min		7:56		X	aq	2	X	X	X		X		
GSF3 Backwash 20 Min		7:58		X	aq	2	X	X	X		X		
GSF3 Backwash 22 min		8:00		X	aq	2	X	X	X		X		

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/5/23	10:00
RECEIVED:	6-5-23	10:00
RELINQUISHED:		
RECEIVED:	6/5/23	1145
RELINQUISHED:	6/5/23	1400
RECEIVED:	6/5/23	1450

TURNAROUND (INDICATE IN CALENDAR DAYS):

HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☒ COOLED ☐ AMBIENT 19.9 °C Upon Receipt at LAB

3.9 to

PRESERVATIVE VERIFIED Initials

WI-L-004r3

3/26/2021

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0522

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/06/2023
Reported: 06/13/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0522-01
Collected By: Customer
Collection Date: 06/06/2023 8:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/07/23 1605	06/10/23 1855	AMF

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/06/23 2134	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/06/23 2134	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/06/23 2134	AMF
SM 4500-H+ B-2000								
pH	**7.28**		S.U.	1	**H1**		06/06/23 2134	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1151	06/07/23 1417	DLO
Iron	<0.0500	0.0500	mg/L	1		06/07/23 1151	06/07/23 1417	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0522-02
Collected By: Customer
Collection Date: 06/06/2023 8:30

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1500	06/08/23 1249	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0522-03	**Collection Date:**	06/06/2023 8:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/07/23 1605	06/10/23 1855	AMF

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/06/23 2134	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/06/23 2134	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/06/23 2134	AMF
SM 4500-H+ B-2000								
pH	**7.32**		S.U.	1	**H1**		06/06/23 2134	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1151	06/07/23 1421	DLO
Iron	<0.0500	0.0500	mg/L	1		06/07/23 1151	06/07/23 1421	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0522-04	**Collection Date:**	06/06/2023 8:30

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1500	06/08/23 1253	DLO

CERTIFICATE OF ANALYSIS

D3F0522

Client Sample ID: GSF3 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0522-05
Collected By: Customer
Collection Date: 06/06/2023 8:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/07/23 1605	06/10/23 1855	AMF

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/06/23 2134	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/06/23 2134	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/06/23 2134	AMF
SM 4500-H+ B-2000								
pH	**7.33**		S.U.	1	**H1**		06/06/23 2134	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1151	06/07/23 1424	DLO
Iron	<0.0500	0.0500	mg/L	1		06/07/23 1151	06/07/23 1424	DLO

Client Sample ID: GSF3 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0522-06
Collected By: Customer
Collection Date: 06/06/2023 8:30

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/07/23 1500	06/08/23 1256	DLO

Client Sample ID: GSF-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0522-07
Collected By: Customer
Collection Date: 06/06/2023 8:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**85.0**	1.00	mg CaCO3/L	1			06/07/23 1915	EMK

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0522-08	**Collection Date:**	06/06/2023 8:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/07/23 1915	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/07/23 1605	06/10/23 1855	AMF

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/06/23 2134	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/06/23 2134	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/06/23 2134	AMF
SM 4500-H+ B-2000								
pH	**7.32**		S.U.	1	**H1**		06/06/23 2134	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.0103**	0.00204	mg/L	1		06/07/23 1151	06/07/23 1428	DLO
Iron	<0.0500	0.0500	mg/L	1		06/07/23 1151	06/07/23 1428	DLO

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0522-09	**Collection Date:**	06/06/2023 8:30

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00383**	0.00204	mg/L	1		06/07/23 1500	06/08/23 1300	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/13/2023 17:14

MICROBAC®

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

Chain of Custody

WWW.Microbac.com

D 3 F 0 5 2 2

NWSI - Northeast Water Solutions, Inc.

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	
GSF1- Effluent	6/6/23	8:30		X	dw	3	x	x	x							X		X			
GSF2- Effluent				X	dw	3	x	x	x							X		X			
GSF3 - Effluent				X	dw	3	x	x	x							X		X			
GSF-Effluent			X		dw	1				X						X					
GSF- Influent				X	dw	4	X	X	X	X						X		X			

PRESERVATIVE VERIFIED Initials

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/6/23	9:33
RECEIVED:	6/6/23	933
RELINQUISHED:	6/6/23	1426
RECEIVED:	6/6/23	1446
RELINQUISHED:	6/6/23	1751
RECEIVED:	6/6/23	1751

TURNAROUND (INDICATE IN CALENDAR DAYS):

HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 19.8 °C Upon Receipt at LAB 2.4°C

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0725

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/07/2023
Reported: 06/14/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0725-01
Collected By: Customer
Collection Date: 06/07/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/07/23 1605	06/10/23 1855	AMF

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/07/23 2124	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/07/23 2124	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/07/23 2124	AMF
SM 4500-H+ B-2000								
pH	**7.33**		S.U.	1	**H1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/08/23 1014	06/08/23 1611	DLO
Iron	<0.0500	0.0500	mg/L	1		06/08/23 1014	06/08/23 1611	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0725-02
Collected By: Customer
Collection Date: 06/07/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/09/23 1149	06/09/23 1341	DLO

Client Sample ID: GSF2 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0725-03
Collected By: Customer
Collection Date: 06/07/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/07/23 1605	06/10/23 1855	AMF

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/07/23 2124	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/07/23 2124	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/07/23 2124	AMF
SM 4500-H+ B-2000								
pH	**7.35**		S.U.	1	**H1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00290**	0.00204	mg/L	1		06/08/23 1014	06/08/23 1615	DLO
Iron	<0.0500	0.0500	mg/L	1		06/08/23 1014	06/08/23 1615	DLO

Client Sample ID: GSF2 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0725-04
Collected By: Customer
Collection Date: 06/07/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/09/23 1149	06/09/23 1345	DLO

CERTIFICATE OF ANALYSIS

D3F0725

Client Sample ID: GSF3 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0725-05
Collected By: Customer
Collection Date: 06/07/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<6.25	6.25	mg/L	3	Y	06/07/23 1605	06/10/23 1855	AMF

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	Y		06/07/23 2124	AMF
Color, Apparent	<1	1	CU	1	Y		06/07/23 2124	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/07/23 2124	AMF
SM 4500-H+ B-2000								
pH	**7.30**		S.U.	1	H1		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/08/23 1014	06/08/23 1626	DLO
Iron	<0.0500	0.0500	mg/L	1		06/08/23 1014	06/08/23 1626	DLO

Client Sample ID: GSF3 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0725-06
Collected By: Customer
Collection Date: 06/07/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/09/23 1149	06/09/23 1349	DLO

Client Sample ID: GSF-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0725-07
Collected By: Customer
Collection Date: 06/07/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/08/23 2045	EMK

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0725-08	**Collection Date:**	06/07/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/08/23 2045	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/07/23 1605	06/10/23 1855	AMF

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/07/23 2124	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/07/23 2124	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/07/23 2124	AMF
SM 4500-H+ B-2000								
pH	**7.32**		S.U.	1	**H1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.0102**	0.00204	mg/L	1		06/08/23 1014	06/08/23 1629	DLO
Iron	<0.0500	0.0500	mg/L	1		06/08/23 1014	06/08/23 1629	DLO

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0725-09	**Collection Date:**	06/07/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/09/23 1149	06/09/23 1400	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/14/2023 10:02

MICROBAC

Chain of Custody

D 3 F 0 7 2 5

NWSI - Northeast Water Solutions, Inc.

BMD

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

WWW.Microbac.com

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity	Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric
GSF1- Effluent	6/7/23	8:10		X	dw	3	x	x	x		X		X		
GSF2- Effluent	↓	↓		X	dw	3	x	x	x		X		X		
GSF3 - Effluent				X	dw	3	x	x	x		X		X		
GSF-Effluent			X		dw	1				X	X		X		
GSF- Influent				X	dw	4	X	X	X	X	X		X		
~~Slow Sand #1~~				~~X~~	~~dw~~	~~2~~		~~X~~	~~X~~		~~X~~		~~X~~		
~~Slow Sand #2~~				~~X~~	~~dw~~	~~2~~		~~X~~	~~X~~		~~X~~		~~X~~		

PRESERVATIVE VERIFIED Initials

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/7/23	9:00
RECEIVED:	6-7-23	900
RELINQUISHED:	6-7-23	1251
RECEIVED:	6-7-23	1251
RELINQUISHED:	6-7-23	1446
RECEIVED:	6/7/23	1446

TURNAROUND (INDICATE IN CALENDAR DAYS): _____ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 18.4 °C Upon Receipt at LAB 2.0 oc ut

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0727

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/07/2023
Reported: 06/20/2023

Analytical Testing Parameters

Client Sample ID: GSF2 Backwash 2 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0727-01
Collected By: Customer
Collection Date: 06/07/2023 7:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**37.0**	25.0	mg/L	10		06/08/23 1955	06/10/23 1540	AMF

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**82.6**	0.100	NTU	1	**Y1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**10.8**	0.0200	mg/L	10		06/09/23 1500	06/13/23 2055	DLO

Client Sample ID: GSF2 Backwash 4 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0727-02
Collected By: Customer
Collection Date: 06/07/2023 7:17

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**13.6**	3.58	mg/L	1		06/13/23 1620	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**52.1**	0.100	NTU	1	**Y1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**3.76**	0.00200	mg/L	1		06/09/23 1500	06/12/23 1749	DLO

Client Sample ID: GSF2 Backwash 6 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0727-03
Collected By: Customer
Collection Date: 06/07/2023 7:19

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**7.72**	3.58	mg/L	1		06/13/23 1620	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**39.1**	0.100	NTU	1	**Y1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**2.59**	0.00200	mg/L	1		06/09/23 1500	06/12/23 1753	DLO

Client Sample ID: GSF2 Backwash 8 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0727-04
Collected By: Customer
Collection Date: 06/07/2023 7:21

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**5.58**	3.58	mg/L	1		06/13/23 1620	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**32.1**	0.100	NTU	1	**Y1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.81**	0.00200	mg/L	1		06/09/23 1500	06/12/23 1803	DLO

Client Sample ID: GSF2 Backwash 10 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0727-05
Collected By: Customer
Collection Date: 06/07/2023 7:23

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**5.15**	3.58	mg/L	1		06/13/23 1620	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**27.5**	0.100	NTU	1	**Y1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.48**	0.00200	mg/L	1		06/09/23 1500	06/12/23 1807	DLO

Client Sample ID: GSF2 Backwash 12 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0727-06
Collected By: Customer
Collection Date: 06/07/2023 7:25

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.43**	3.58	mg/L	1		06/13/23 1620	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**25.1**	0.100	NTU	1	**Y1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.24**	0.00200	mg/L	1		06/09/23 1500	06/12/23 1811	DLO

Client Sample ID: GSF2 Backwash 14 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0727-07
Collected By: Customer
Collection Date: 06/07/2023 7:27

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.29**	3.58	mg/L	1		06/13/23 1620	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**23.6**	0.100	NTU	1	**Y1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.15**	0.00200	mg/L	1		06/09/23 1500	06/12/23 1814	DLO

Client Sample ID: GSF2 Backwash 16 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0727-08
Collected By: Customer
Collection Date: 06/07/2023 7:29

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**3.72**	3.58	mg/L	1		06/13/23 1620	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**25.4**	0.100	NTU	1	**Y1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.09**	0.00200	mg/L	1		06/09/23 1500	06/12/23 1827	DLO

Client Sample ID: GSF2 Backwash 18 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0727-09
Collected By: Customer
Collection Date: 06/07/2023 7:31

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.15**	3.58	mg/L	1		06/13/23 1620	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**24.0**	0.100	NTU	1	**Y1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.28**	0.00200	mg/L	1		06/09/23 1500	06/12/23 1831	DLO

Client Sample ID: GSF2 Backwash 20 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0727-10
Collected By: Customer
Collection Date: 06/07/2023 7:33

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	<4.18	4.18	mg/L	2		06/13/23 1620	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**23.9**	0.100	NTU	1	**Y1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.19**	0.00200	mg/L	1		06/09/23 1500	06/12/23 1835	DLO

Client Sample ID: GSF2 Backwash 22 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F0727-11
Collected By: Customer
Collection Date: 06/07/2023 7:35

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	<5.00	5.00	mg/L	2		06/13/23 1620	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**23.0**	0.100	NTU	1	**Y1**		06/07/23 2124	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.13**	0.00200	mg/L	1		06/09/23 1500	06/12/23 1839	DLO

Definitions

MCL:	US EPA Maximum Contaminant Level
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
Y1:	Accreditation is not offered by the accrediting body for this analyte.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/20/2023 15:38

MICROBAC®

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5(

D 3 F 0 7 2 7

NWSI - Northeast Water Solutions, inc.

Lab WO#: _____

Project Manager: _____

BwD

Copy of Report To

CUSTOMER: NWSI-Northeast Water Solutions
ADDRESS: 567 S County TRL
Exeter, RI 02822
ATTENTION: Robert Ferrari
E-MAIL: labreports@nwsi.net
PHONE: 401-667-7463

Invoice Information (Credit Card Only)

BILL TO: same
ADDRESS: _____
ATTENTION: _____
TELEPHONE: _____
PURCHASE ORDER # : _____

Project Information

Project: Housatonic HWWC
Project Location Housatonic MA
Project Manager _____
EMAIL: smurphy@nwsi.net
TELEPHONE: _____
Fax: _____

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	Total Mn	Analysis: TSS, Turbidity	Preservatives: Non-pres	Preservatives: HCL	Preservatives: HNO3	Preservatives: NH4Cl	Preservatives: Sulfuric
GSF Backwash 2 min.	6/7/23	7:15		X	aq	2	X	X	X		X		
GSF Backwash 4 Min		7:17		X	aq	2	X	X	X		X		
GSF Backwash 6 Min.		7:19		X	aq	2	X	X	X		X		
GSF Backwash 8 Min		7:21		X	aq	2	X	X	X		X		
GSF Backwash 10 min		7:23		X	aq	2	X	X	X		X		
GSF Backwash 12 Min		7:25		X	aq	2	X	X	X		X		
GSF Backwash 14 min		7:27		X	aq	2	X	X	X		X		
GSF Backwash 16 min		7:29		X	aq	2	X	X	X		X		
GSF Backwash 18 min		7:31		X	aq	2	X	X	X		X		
GSF Backwash 20 Min		7:33		X	aq	2	X	X	X		X		
GSF Backwash 22 min		7:35		X	aq	2	X	X	X		X		

PRESERVATIVE VERIFIED Initials

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/7/23	9:00
RECEIVED:	6-7-23	900
RELINQUISHED:	6-7-23	1251
RECEIVED:	6-7-23	1251
RELINQUISHED:	6-7-23	1626
RECEIVED:	6-7-23	1636

TURNAROUND (INDICATE IN CALENDAR DAYS): _____ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS: _____

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐AMBIENT 18.3 °C Upon Receipt at LAB

2.8 °C ut

WI-L-004r3

3/26/2021

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0925

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/08/2023
Reported: 06/19/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0925-01
Collected By: Customer
Collection Date: 06/08/2023 8:50

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/08/23 2212	MMK
Color, Apparent	<1	1	CU	1	**Y**		06/08/23 2212	MMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/08/23 2212	MMK
SM 4500-H+ B-2000								
pH	**7.59**		S.U.	1	**H1**		06/08/23 2212	MMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/09/23 1149	06/09/23 1422	DLO
Iron	<0.0500	0.0500	mg/L	1		06/09/23 1149	06/09/23 1422	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0925-02
Collected By: Customer
Collection Date: 06/08/2023 8:50

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/12/23 1210	06/12/23 1540	DLO

Client Sample ID: GSF2 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0925-03
Collected By: Customer
Collection Date: 06/08/2023 8:50

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.58	3.58	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/08/23 2212	MMK
Color, Apparent	<1	1	CU	1	**Y**		06/08/23 2212	MMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/08/23 2212	MMK
SM 4500-H+ B-2000								
pH	**7.50**		S.U.	1	**H1**		06/08/23 2212	MMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/09/23 1149	06/09/23 1426	DLO
Iron	<0.0500	0.0500	mg/L	1		06/09/23 1149	06/09/23 1426	DLO

Client Sample ID: GSF2 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0925-04
Collected By: Customer
Collection Date: 06/08/2023 8:50

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/12/23 1210	06/12/23 1544	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0925-05	**Collection Date:**	06/08/2023 8:50

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.58	3.58	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/08/23 2212	MMK
Color, Apparent	<1	1	CU	1	**Y**		06/08/23 2212	MMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/08/23 2212	MMK
SM 4500-H+ B-2000								
pH	**7.58**		S.U.	1	**H1**		06/08/23 2212	MMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/09/23 1149	06/09/23 1430	DLO
Iron	<0.0500	0.0500	mg/L	1		06/09/23 1149	06/09/23 1430	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0925-06	**Collection Date:**	06/08/2023 8:50

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/12/23 1210	06/12/23 1548	DLO

Client Sample ID:	GSF-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0925-07	**Collection Date:**	06/08/2023 8:50

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/09/23 1725	EMK

CERTIFICATE OF ANALYSIS

D3F0925

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0925-08	**Collection Date:**	06/08/2023 8:50

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/09/23 1725	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.58	3.58	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/08/23 2212	MMK
Color, Apparent	<1	1	CU	1	**Y**		06/08/23 2212	MMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/08/23 2212	MMK
SM 4500-H+ B-2000								
pH	**7.63**		S.U.	1	**H1**		06/08/23 2212	MMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00889**	0.00204	mg/L	1		06/09/23 1149	06/09/23 1433	DLO
Iron	<0.0500	0.0500	mg/L	1		06/09/23 1149	06/09/23 1433	DLO

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0925-09	**Collection Date:**	06/08/2023 8:50

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/12/23 1210	06/12/23 1551	DLO

Client Sample ID:	Slow Sand #1		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0925-10	**Collection Date:**	06/08/2023 8:50

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.0151**	0.00204	mg/L	1		06/09/23 1149	06/09/23 1444	DLO
Iron	<0.0500	0.0500	mg/L	1		06/09/23 1149	06/09/23 1444	DLO

CERTIFICATE OF ANALYSIS

D3F0925

Client Sample ID: Slow Sand #1
Sample Matrix: Drinking Water
Lab Sample ID: D3F0925-11
Collected By: Customer
Collection Date: 06/08/2023 8:50

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.0143**	0.00204	mg/L	1		06/12/23 1210	06/12/23 1555	DLO

Client Sample ID: Slow Sand #2
Sample Matrix: Drinking Water
Lab Sample ID: D3F0925-12
Collected By: Customer
Collection Date: 06/08/2023 8:50

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/09/23 1149	06/09/23 1448	DLO
Iron	<0.0500	0.0500	mg/L	1		06/09/23 1149	06/09/23 1448	DLO

Client Sample ID: Slow Sand #2
Sample Matrix: Drinking Water
Lab Sample ID: D3F0925-13
Collected By: Customer
Collection Date: 06/08/2023 8:50

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/12/23 1210	06/12/23 1605	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville
M-CT008 — Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/19/2023 15:54

BMD

MICROBAC®

D 3 F 0 9 2 5

NWSI - Northeast Water Solutions, Inc.

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

Lab WO#: _____

Project Manager: _____

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	
GSF1- Effluent	6/8/23	8:50		X	dw	3	x	x	x							X		X			
GSF2- Effluent				X	dw	3	x	x	x							X		X			
GSF3 - Effluent				X	dw	3	x	x	x							X		X			
GSF-Effluent			X		dw	1				X						X		X			
GSF- Influent				X	dw	4	X	X	X	X						X		X			
Slow Sand #1				X	dw	2		X	X							X		X			
Slow Sand #2				X	dw	2		X	x							X		X			

PRESERVATIVE VERIFIED Initials

TURNAROUND (INDICATE IN CALENDAR DAYS): _____ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/8/23	10:25
RECEIVED:	6-8-23	10:25
RELINQUISHED:	6-8-23	1504
RECEIVED:	6-8-23	1504
RELINQUISHED:	6-8-23	1900
RECEIVED:	6/8/23	1900

COMMENTS: _____

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 8.3 C Upon Receipt at LAB 2.4°C at

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0927

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/08/2023
Reported: 06/19/2023

Analytical Testing Parameters

Client Sample ID: GSF - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0927-01
Collected By: Customer
Collection Date: 06/08/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Hach Test Kit, DOC326.98.00004								
Carbon dioxide	**10.0**	1.20	mg/L	1	**Y**		06/13/23 2130	CEO
SM 2510 B-1997								
Conductivity (at 25°C)	**221**	1.00	umhos/cm	1	**Y**		06/13/23 1658	AMF
SM 4500-NO_3^- F-2000								
Nitrate as N	**0.170**	0.0500	mg/L	1			06/08/23 2240	AJW
Nitrite as N	<0.0100	0.0100	mg/L	1			06/08/23 2240	AJW
SM 4500-SO_4^- E-1997								
Sulfate	<5.00	5.00	mg/L	1			06/13/23 1326	CLW
Wet-Solids-DW/SM 2540 C-1997								
Total Dissolved Solids (TDS)	**120**	25.0	mg/L	10		06/12/23 2020	06/15/23 1840	AJD

Metals Total by CVAA	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 245.1, Rv. 3 (1994)								
Mercury	<0.00020	0.00020	mg/L	1		06/12/23 1230	06/12/23 1314	GEE

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Calcium	**20.9**	0.0500	mg/L	1		06/09/23 1149	06/09/23 1452	DLO
Magnesium	**8.84**	0.0510	mg/L	1	**Y1**	06/09/23 1149	06/09/23 1452	DLO
Potassium	**0.475**	0.204	mg/L	1	**Y1**	06/09/23 1149	06/09/23 1452	DLO
Sodium	**7.60**	1.02	mg/L	1		06/09/23 1149	06/09/23 1452	DLO

Metals Total by ICPMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.8, Rv. 5.4 (1994)								
Aluminum	<0.0100	0.0100	mg/L	1		06/09/23 1328	06/09/23 1752	MMC
Arsenic	<0.0040	0.0040	mg/L	1		06/09/23 1328	06/09/23 1752	MMC
Beryllium	<0.0010	0.0010	mg/L	1		06/09/23 1328	06/09/23 1752	MMC
Cadmium	<0.0010	0.0010	mg/L	1		06/09/23 1328	06/09/23 1752	MMC
Chromium	<0.0010	0.0010	mg/L	1		06/09/23 1328	06/09/23 1752	MMC
Copper	**0.0088**	0.0010	mg/L	1		06/09/23 1328	06/09/23 1752	MMC
Lead	<0.0010	0.0010	mg/L	1		06/09/23 1328	06/09/23 1752	MMC
Zinc	**0.0114**	0.0050	mg/L	1		06/09/23 1328	06/09/23 1752	MMC

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								

CERTIFICATE OF ANALYSIS

D3F0927

Client Sample ID:	GSF - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0927-01	**Collection Date:**	06/08/2023 8:15

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Total Trihalomethanes	**22.8**	0.500	ug/L	1			06/09/23 1522	ADF
Bromodichloromethane	**4.33**	0.500	ug/L	1			06/09/23 1522	ADF
Bromoform	<0.500	0.500	ug/L	1			06/09/23 1522	ADF
Chloroform	**17.8**	0.500	ug/L	1			06/09/23 1522	ADF
Chlorodibromomethane	**0.630**	0.500	ug/L	1			06/09/23 1522	ADF
Surrogate: 4-Bromofluorobenzene	96.4	Limit: 70-130	% Rec	1			06/09/23 1522	ADF
Surrogate: 1,2-Dichlorobenzene-d4	97.6	Limit: 70-130	% Rec	1			06/09/23 1522	ADF

Semivolatile Organic Compounds by GC/ECD	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 552.2, Rv. 1 (1995)								
Total Haloacetic acids (HAA5)	**17.0**	1.00	ug/L	1		06/09/23 1132	06/12/23 1913	ALG
Chloroacetic acid [2C]	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1913	ALG
Bromoacetic acid [2C]	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1913	ALG
Dichloroacetic acid [2C]	**7.56**	1.00	ug/L	1		06/09/23 1132	06/12/23 1913	ALG
Trichloroacetic acid [2C]	**9.43**	1.00	ug/L	1		06/09/23 1132	06/12/23 1913	ALG
Dibromoacetic acid [2C]	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1913	ALG
Surrogate: 2,3-Dibromopropionic acid	78.1	Limit: 70-130	% Rec	1		06/09/23 1132	06/12/23 1913	ALG
Surrogate: 2,3-Dibromopropionic acid [2C]	82.7	Limit: 70-130	% Rec	1		06/09/23 1132	06/12/23 1913	ALG

Anions by IC	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 300.0, Rv. 2.1 (1993)								
Chloride	**12.7**	1.00	mg/L	1			06/09/23 1348	IMM

Client Sample ID:	Slow Sand #1		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0927-02	**Collection Date:**	06/08/2023 8:15

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								
Total Trihalomethanes	<0.500	0.500	ug/L	1			06/09/23 1546	ADF
Bromodichloromethane	<0.500	0.500	ug/L	1			06/09/23 1546	ADF
Bromoform	<0.500	0.500	ug/L	1			06/09/23 1546	ADF
Chloroform	<0.500	0.500	ug/L	1			06/09/23 1546	ADF
Chlorodibromomethane	<0.500	0.500	ug/L	1			06/09/23 1546	ADF
Surrogate: 4-Bromofluorobenzene	93.0	Limit: 70-130	% Rec	1			06/09/23 1546	ADF
Surrogate: 1,2-Dichlorobenzene-d4	93.8	Limit: 70-130	% Rec	1			06/09/23 1546	ADF

Semivolatile Organic Compounds by GC/ECD	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 552.2, Rv. 1 (1995)								
Total Haloacetic acids (HAA5)	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1936	ALG
Chloroacetic acid	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1936	ALG
Bromoacetic acid	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1936	ALG
Dichloroacetic acid	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1936	ALG
Trichloroacetic acid	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1936	ALG
Dibromoacetic acid	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1936	ALG
Surrogate: 2,3-Dibromopropionic acid	86.5	Limit: 70-130	% Rec	1		06/09/23 1132	06/12/23 1936	ALG
Surrogate: 2,3-Dibromopropionic acid [2C]	93.9	Limit: 70-130	% Rec	1		06/09/23 1132	06/12/23 1936	ALG

Client Sample ID:	Slow Sand #2		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0927-03	**Collection Date:**	06/08/2023 8:15

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								
Total Trihalomethanes	<0.500	0.500	ug/L	1			06/09/23 1610	ADF
Bromodichloromethane	<0.500	0.500	ug/L	1			06/09/23 1610	ADF
Bromoform	<0.500	0.500	ug/L	1			06/09/23 1610	ADF
Chloroform	<0.500	0.500	ug/L	1			06/09/23 1610	ADF
Chlorodibromomethane	<0.500	0.500	ug/L	1			06/09/23 1610	ADF
Surrogate: 4-Bromofluorobenzene	96.2	Limit: 70-130	% Rec	1			06/09/23 1610	ADF
Surrogate: 1,2-Dichlorobenzene-d4	97.2	Limit: 70-130	% Rec	1			06/09/23 1610	ADF

Semivolatile Organic Compounds by GC/ECD	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 552.2, Rv. 1 (1995)								
Total Haloacetic acids (HAA5)	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1958	ALG
Chloroacetic acid [2C]	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1958	ALG
Bromoacetic acid [2C]	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1958	ALG
Dichloroacetic acid [2C]	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1958	ALG
Trichloroacetic acid [2C]	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1958	ALG
Dibromoacetic acid [2C]	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 1958	ALG
Surrogate: 2,3-Dibromopropionic acid	85.9	Limit: 70-130	% Rec	1		06/09/23 1132	06/12/23 1958	ALG
Surrogate: 2,3-Dibromopropionic acid [2C]	92.2	Limit: 70-130	% Rec	1		06/09/23 1132	06/12/23 1958	ALG

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0927-04	**Collection Date:**	06/08/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Hach Test Kit, DOC326.98.00004								
Carbon dioxide	**8.00**	1.20	mg/L	1	**Y**		06/13/23 2130	CEO
SM 2510 B-1997								
Conductivity (at 25°C)	**221**	1.00	umhos/cm	1	**Y**		06/13/23 1658	AMF
SM 4500-NO_3^- F-2000								
Nitrate as N	**0.170**	0.0500	mg/L	1			06/08/23 2256	AJW
Nitrite as N	<0.0100	0.0100	mg/L	1			06/08/23 2256	AJW
SM 4500-SO_4^- E-1997								
Sulfate	<5.00	5.00	mg/L	1			06/13/23 1326	CLW
Wet-Solids-DW/SM 2540 C-1997								
Total Dissolved Solids (TDS)	**113**	25.0	mg/L	10		06/12/23 2020	06/15/23 1840	AJD

Metals Total by CVAA	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 245.1, Rv. 3 (1994)								
Mercury	<0.00020	0.00020	mg/L	1		06/12/23 1230	06/12/23 1327	GEE

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Calcium	**21.0**	0.0500	mg/L	1		06/09/23 1149	06/09/23 1455	DLO
Magnesium	**8.90**	0.0510	mg/L	1	**Y1**	06/09/23 1149	06/09/23 1455	DLO
Potassium	**0.465**	0.204	mg/L	1	**Y1**	06/09/23 1149	06/09/23 1455	DLO
Sodium	**7.56**	1.02	mg/L	1		06/09/23 1149	06/09/23 1455	DLO

Metals Total by ICPMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.8, Rv. 5.4 (1994)								
Aluminum	<0.0100	0.0100	mg/L	1		06/09/23 1328	06/09/23 1753	MMC
Arsenic	<0.0040	0.0040	mg/L	1		06/09/23 1328	06/09/23 1753	MMC
Beryllium	<0.0010	0.0010	mg/L	1		06/09/23 1328	06/09/23 1753	MMC
Cadmium	<0.0010	0.0010	mg/L	1		06/09/23 1328	06/09/23 1753	MMC
Chromium	<0.0010	0.0010	mg/L	1		06/09/23 1328	06/09/23 1753	MMC
Copper	**0.0098**	0.0010	mg/L	1		06/09/23 1328	06/09/23 1753	MMC
Lead	<0.0010	0.0010	mg/L	1		06/09/23 1328	06/09/23 1753	MMC
Zinc	**0.0120**	0.0050	mg/L	1		06/09/23 1328	06/09/23 1753	MMC

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								
Total Trihalomethanes	**23.3**	0.500	ug/L	1			06/09/23 1635	ADF
Bromodichloromethane	**4.34**	0.500	ug/L	1			06/09/23 1635	ADF
Bromoform	<0.500	0.500	ug/L	1			06/09/23 1635	ADF
Chloroform	**18.4**	0.500	ug/L	1			06/09/23 1635	ADF
Chlorodibromomethane	**0.610**	0.500	ug/L	1			06/09/23 1635	ADF
Surrogate: 4-Bromofluorobenzene	94.2	Limit: 70-130	% Rec	1			06/09/23 1635	ADF

CERTIFICATE OF ANALYSIS

D3F0927

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0927-04	**Collection Date:**	06/08/2023 8:15

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Surrogate: 1,2-Dichlorobenzene-d4	99.4	Limit: 70-130	% Rec	1			06/09/23 1635	ADF

Semivolatile Organic Compounds by GC/ECD	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 552.2, Rv. 1 (1995)								
Total Haloacetic acids (HAA5)	**16.4**	1.00	ug/L	1		06/09/23 1132	06/12/23 2021	ALG
Chloroacetic acid [2C]	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 2021	ALG
Bromoacetic acid [2C]	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 2021	ALG
Dichloroacetic acid [2C]	**7.09**	1.00	ug/L	1		06/09/23 1132	06/12/23 2021	ALG
Trichloroacetic acid [2C]	**9.30**	1.00	ug/L	1		06/09/23 1132	06/12/23 2021	ALG
Dibromoacetic acid [2C]	<1.00	1.00	ug/L	1		06/09/23 1132	06/12/23 2021	ALG
Surrogate: 2,3-Dibromopropionic acid	85.2	Limit: 70-130	% Rec	1		06/09/23 1132	06/12/23 2021	ALG
Surrogate: 2,3-Dibromopropionic acid [2C]	90.8	Limit: 70-130	% Rec	1		06/09/23 1132	06/12/23 2021	ALG

Anions by IC	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 300.0, Rv. 2.1 (1993)								
Chloride	**12.7**	1.00	mg/L	1			06/09/23 1403	IMM

Definitions

AL:	US EPA Action Level
MCL:	US EPA Maximum Contaminant Level
mg/L:	Milligrams per Liter
RL:	Reporting Limit
ug/L:	Micrograms per Liter
umhos/cm:	Umhos per Centimeter
Y:	This analyte is not on the laboratory's current scope of accreditation.
Y1:	Accreditation is not offered by the accrediting body for this analyte.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008 — Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/19/2023 15:55

D3F0927

NWSI - Northeast Water Solutions, inc.

BMO

MICROBAC®

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-50

www.microbac.com

Lab WO#:

Project Manager:

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	THM/HAA	Analysis: TDS, Con, Cl, NO2, NO3, SO4	Analysis: CO2	Analysis: Al, Na, Zn, Ca, Mg, K	Analysis: Heavy Meta Metals	Analysis	Analysis	Preservatives: Non-pres	Preservatives: HCL	Preservatives: HNO3	Preservatives: NH4Cl	Preservatives: NH4CL/NaThic
GSF Effluent	6/8/23	8:15	X		dw	8	x	x	x	x	X			x		x		X
Slow Sand #1	↓	↓		X	dw	4	X											X
Slow Sand #2				X	dw	4	X											X
GSF-Influent				X	dw	8	X	X	X	X	X			X		X		X

PRESERVATIVE VERIFIED Initials

TURNAROUND (INDICATE IN CALENDAR DAYS)

HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER: C. Ivy	6/8/23	10:05
RECEIVED: [illegible]	6/8/23	10:25
RELINQUISHED: [illegible]	6/8/23	1504
RECEIVED: [illegible]	6-8-23	1500
RELINQUISHED: [illegible]	6-8-23	1800
RECEIVED: [illegible]	6-8-23	1800

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 17.4 °C Upon Receipt at LAB

2-4°C

Page 7 of 7

MICROBAC®

Microbac Laboratories, Inc., Lee

CERTIFICATE OF ANALYSIS

E3F0165

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/08/2023
Reported: 06/13/2023

Analytical Testing Parameters

Client Sample ID: GSF1-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: E3F0165-01
Collected By: Sean Murphy
Collection Date: 06/08/2023 8:00

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.71**	1	S.U.	1		06/08/23 0800	06/10/23 0000	SUB
UV 254	**0.016**	0.001	abs/cm	1		06/08/23 0800	06/09/23 0000	SUB

Client Sample ID: GSF-Influent
Sample Matrix: Drinking Water
Lab Sample ID: E3F0165-02
Collected By: Sean Murphy
Collection Date: 06/08/2023 8:00

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.66**	1	S.U.	1		06/08/23 0800	06/10/23 0000	SUB
UV 254	**0.018**	0.001	abs/cm	1		06/08/23 0800	06/09/23 0000	SUB

Client Sample ID: HWWC-Raw
Sample Matrix: Drinking Water
Lab Sample ID: E3F0165-03
Collected By: Sean Murphy
Collection Date: 06/08/2023 8:00

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**8.03**	1	S.U.	1		06/08/23 0800	06/10/23 0000	SUB
UV 254	**0.049**	0.001	abs/cm	1		06/08/23 0800	06/09/23 0000	SUB

Client Sample ID: Slow Sand #1
Sample Matrix: Drinking Water
Lab Sample ID: E3F0165-04
Collected By: Sean Murphy
Collection Date: 06/08/2023 8:00

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.59**	1	S.U.	1		06/08/23 0800	06/10/23 0000	SUB
UV 254	**0.024**	0.001	abs/cm	1		06/08/23 0800	06/09/23 0000	SUB

CERTIFICATE OF ANALYSIS

E3F0165

Client Sample ID:	Slow Sand #2		
Sample Matrix:	Drinking Water	**Collected By:**	Sean Murphy
Lab Sample ID:	E3F0165-05	**Collection Date:**	06/08/2023 8:00

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.68**	1	S.U.	1		06/08/23 0800	06/10/23 0000	SUB
UV 254	**0.021**	0.001	abs/cm	1		06/08/23 0800	06/09/23 0000	SUB

Client Sample ID:	GSF2-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Sean Murphy
Lab Sample ID:	E3F0165-06	**Collection Date:**	06/08/2023 8:00

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.74**	1	S.U.	1		06/08/23 0800	06/10/23 0000	SUB
UV 254	**0.016**	0.001	abs/cm	1		06/08/23 0800	06/09/23 0000	SUB

Client Sample ID:	GSF3-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Sean Murphy
Lab Sample ID:	E3F0165-07	**Collection Date:**	06/08/2023 8:00

Analyses Performed by: Phoenix Environmental Laboratories, Inc

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM5910 B-2000								
pH	**7.76**	1	S.U.	1		06/08/23 0800	06/10/23 0000	SUB
UV 254	**0.016**	0.001	abs/cm	1		06/08/23 0800	06/09/23 0000	SUB

Definitions

abs/cm:	Absorbance per Centimeter
MCL:	US EPA Maximum Contaminant Level
RL:	Reporting Limit
S.U.:	Standard Units

Project Requested Certification(s)

Phoenix Environmental Laboratories, Inc

PH-0618	Connecticut Department of Public Health
M-CT007	Massachusetts Department of Environmental Protection
63	Rhode Island Department of Health

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Christine F. Reynolds
Service Center Manager
Reported: 06/13/2023 09:55

MICROBAC®

Chain of Custody

WWW.Microbac.com

E 3 F 0 1 6 5

NWSI - Northeast Water Solutions, Inc.

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5(

Copy of Report To

CUSTOMER: Solutions
ADDRESS: 567 S County TRL
Exeter, RI 02822
ATTENTION: Robert Ferrari
E-MAIL: labreports@nwsi.net
PHONE: 401-667-7463

Billing Information (for credit card only)

BILL TO: same
ADDRESS:
ATTENTION:
TELEPHONE:
PURCHASE ORDER # :

Project Information

Project: Housatonic HWWC
Project Location Housatonic MA
Project Manager
EMAIL: smurphy@nwsi.net
TELEPHONE:
Fax:

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	UV254	Analysis	Preservatives: Non-pres	Preservatives: HCL	Preservatives: HNO3	Preservatives: NH4Cl	Preservatives: Sulfuric
GSF1- Effluent	6/8/23	8:00		x	dw	2	x		X				
GSF-Influent		8:00		x	dw	2	x		x				
HWWC-Raw		8:00		x	dw	2	x		x				
Slow Sand #1		8:00		x	dw	2	X		x				
Slow Sand #2		8:00		x	dw	2	X		x				
GSF2-Effluent		8:00		x	dw	2	X		x				
GSF3-Effluent	√	8:00		x	dw	2	X		x				

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER: J. Ff	6/8/23	10:25
RECEIVED: C Reynolds	6/8/23	10:25
RELINQUISHED:		
RECEIVED:		
RELINQUISHED:		
RECEIVED:		

TURNAROUND (INDICATE IN CALENDAR DAYS):
HARD COPY or E-MAIL
EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)
☐ COOLED ☐AMBIENT 17.7 °C Upon Receipt at LAB

WI-L-004r3

6/20/2021

PHOENIX
Environmental Laboratories, Inc.

Monday, June 12, 2023

Attn:
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Project ID: **E3F0165**
SDG ID: **GCO23615**
Sample ID#s: **CO23615 - CO23621**

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

June 12, 2023

SDG I.D.: GCO23615

Project ID: E3F0165

Client Id	Lab Id	Matrix
E3F0165-01	CO23615	DRINKING WATER
E3F0165-02	CO23616	DRINKING WATER
E3F0165-03	CO23617	DRINKING WATER
E3F0165-04	CO23618	DRINKING WATER
E3F0165-05	CO23619	DRINKING WATER
E3F0165-06	CO23620	DRINKING WATER
E3F0165-07	CO23621	DRINKING WATER

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 12, 2023

FOR: Attn:
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/08/23	8:00
Location Code:	MICROBAC-MA	Received by:	SR1	06/09/23	10:08
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO23615
Phoenix ID: CO23615

Project ID: E3F0165
Client ID: E3F0165-01

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.71	1.00	1	pH Units			6.5-8.5	06/10/23 03:30	MEL/EG	SM4500-H B-11
UV-254 (Absorbance)	0.016	0.001	1	/cm				06/09/23 18:12	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
June 12, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 12, 2023

FOR: Attn:
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/08/23	8:00
Location Code:	MICROBAC-MA	Received by:	SR1	06/09/23	10:08
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO23615
Phoenix ID: CO23616

Project ID: E3F0165
Client ID: E3F0165-02

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.66	1.00	1	pH Units			6.5-8.5	06/10/23 03:33	MEL/EG	SM4500-H B-11
UV-254 (Absorbance)	0.018	0.001	1	/cm				06/09/23 18:18	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

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Phyllis Shiller, Laboratory Director
June 12, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 12, 2023

FOR: Attn:
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/08/23	8:00
Location Code:	MICROBAC-MA	Received by:	SR1	06/09/23	10:08
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO23615
Phoenix ID: CO23617

Project ID: E3F0165
Client ID: E3F0165-03

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	8.03	1.00	1	pH Units			6.5-8.5	06/10/23 03:35	MEL/EG	SM4500-H B-11
UV-254 (Absorbance)	0.049	0.001	1	/cm				06/09/23 18:21	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

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Phyllis Shiller, Laboratory Director
June 12, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 12, 2023

FOR: Attn:
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/08/23	8:00
Location Code:	MICROBAC-MA	Received by:	SR1	06/09/23	10:08
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO23615
Phoenix ID: CO23618

Project ID: E3F0165
Client ID: E3F0165-04

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.59	1.00	1	pH Units			6.5-8.5	06/10/23 03:37	MEL/EG	SM4500-H B-11
UV-254 (Absorbance)	0.024	0.001	1	/cm				06/09/23 18:25	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
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Phyllis Shiller, Laboratory Director
June 12, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 12, 2023

FOR: Attn:
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/08/23	8:00
Location Code:	MICROBAC-MA	Received by:	SR1	06/09/23	10:08
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO23615
Phoenix ID: CO23619

Project ID: E3F0165
Client ID: E3F0165-05

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.68	1.00	1	pH Units			6.5-8.5	06/10/23 03:39	MEL/EG	SM4500-H B-11
UV-254 (Absorbance)	0.021	0.001	1	/cm				06/09/23 18:29	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
June 12, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 12, 2023

FOR: Attn:
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/08/23	8:00
Location Code:	MICROBAC-MA	Received by:	SR1	06/09/23	10:08
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO23615
Phoenix ID: CO23620

Project ID: E3F0165
Client ID: E3F0165-06

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.74	1.00	1	pH Units			6.5-8.5	06/10/23 04:02	MEL/EG	SM4500-H B-11
UV-254 (Absorbance)	0.016	0.001	1	/cm				06/09/23 18:31	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
June 12, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

June 12, 2023

FOR: Attn:
Microbac Laboratories, Inc
80 Run Way
Lee, MA 01238

Sample Information		Custody Information		Date	Time
Matrix:	DRINKING WATER	Collected by:	SM	06/08/23	8:00
Location Code:	MICROBAC-MA	Received by:	SR1	06/09/23	10:08
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCO23615
Phoenix ID: CO23621

Project ID: E3F0165
Client ID: E3F0165-07

Parameter	Result	RL/ PQL	DIL	Units	AL	MCL	Other	Date/Time	By	Reference
pH	7.76	1.00	1	pH Units			6.5-8.5	06/10/23 04:05	MEL/EG	SM4500-H B-11
UV-254 (Absorbance)	0.016	0.001	1	/cm				06/09/23 18:34	MW	SM5910B-00

RL/PQL=Reporting/Practical Quantitation Level DIL=Dilution (analysis required diluting to evaluate) ND=Not Detected
BRL=Below Reporting Level (less than the reporting level, the lowest amount the laboratory can detect and report.)
AL = Action Level MCL = Maximum Contaminant Level Other = Other Goals or Guidances

Comments:

Other Levels (OTHER): 40 CFR Part 143 Secondary Goals. Other are non-enforceable goals or guidances.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

UV-254:
The sample was filtered using a 0.45um filter and read at a wavelength of 256nm.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
June 12, 2023
Reviewed and Released by: Rashmi Makol, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102

QA/QC Report

June 12, 2023

QA/QC Data

SDG I.D.: GCO23615

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 681729 (pH), QC Sample No: CO23620 (CO23620, CO23621)													
pH			7.74	7.69	0.60	98.5						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 681728 (pH), QC Sample No: CO24699 (CO23615, CO23616, CO23617, CO23618, CO23619)													
pH			7.86	7.79	0.90	98.4						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 681656 (/cm), QC Sample No: CO23615 (CO23615, CO23616, CO23617, CO23618, CO23619, CO23620, CO23621)													
UV-254 (Absorbance)	BRL	0	0.016	0.014	13.3	95.1							

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
June 12, 2023

Monday, June 12, 2023

Criteria: MA: DW

State: MA

Sample Criteria Exceedances Report

GCO23615 - MICROBAC-MA

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Comments

June 12, 2023 SDG I.D.: GCO23615

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

Microbac Laboratories, Inc., Lee

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SUBCONTRACTED CHAIN OF CUSTODY

E3F0165

4.4 JVC JAC

SENDING LABORATORY:

Microbac Laboratories, Inc., Lee
80 Run Way
Lee, MA 01238
Phone: 413-776-5025
Lab Manager: Brayton Doar
Email: Brayton.Doar@microbac.com

RECEIVING LABORATORY:

Phoenix Environmental Laboratories, Inc
587 E Middle TPKE PO BOX 370
Manchester, CT 06040
Phone: (860) 645-1102

Project Info:

PWSID:

Project Type: ENV-DrinkingWater
Project Location: Massachusetts
Report TAT: 7
Due: **06/19/2023 17:00**

Project Requested Certifications

Massachusetts Department of Environmental Protection

Sample ID: E3F0165-01 23615 **Sampled: 06/08/2023 08:00** Sampler: Sean Murphy
Matrix: Drinking Water Description: GSF1-Effluent
Loc ID:

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/15/2023 22:59	06/08/2023 08:14
UV254 SM5910-B	SM5910 B-2000	06/15/2023 22:59	06/10/2023 08:00

Sample ID: E3F0165-02 23616 **Sampled: 06/08/2023 08:00** Sampler: Sean Murphy
Matrix: Drinking Water Description: GSF-Influent
Loc ID:

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/15/2023 22:59	06/08/2023 08:14
UV254 SM5910-B	SM5910 B-2000	06/15/2023 22:59	06/10/2023 08:00

Sample ID: E3F0165-03 23617 **Sampled: 06/08/2023 08:00** Sampler: Sean Murphy
Matrix: Drinking Water Description: HWWC-Raw
Loc ID:

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/15/2023 22:59	06/08/2023 08:14
UV254 SM5910-B	SM5910 B-2000	06/15/2023 22:59	06/10/2023 08:00

Sample ID: E3F0165-04 23618 **Sampled: 06/08/2023 08:00** Sampler: Sean Murphy
Matrix: Drinking Water Description: Slow Sand #1
Loc ID:

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/15/2023 22:59	06/08/2023 08:14
UV254 SM5910-B	SM5910 B-2000	06/15/2023 22:59	06/10/2023 08:00

over →

Microbac Laboratories, Inc., Lee

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SUBCONTRACTED CHAIN OF CUSTODY

E3F0165

Project Requested Certifications

Massachusetts Department of Environmental Protection

Sample ID: E3F0165-05 23619 **Sampled: 06/08/2023 08:00** Sampler: Sean Murphy

Matrix: Drinking Water Description: Slow Sand #2

Loc ID:

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/15/2023 22:59	06/08/2023 08:14
UV254 SM5910-B	SM5910 B-2000	06/15/2023 22:59	06/10/2023 08:00

Sample ID: E3F0165-06 23620 **Sampled: 06/08/2023 08:00** Sampler: Sean Murphy

Matrix: Drinking Water Description: GSF2-Effluent

Loc ID:

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/15/2023 22:59	06/08/2023 08:14
UV254 SM5910-B	SM5910 B-2000	06/15/2023 22:59	06/10/2023 08:00

Sample ID: E3F0165-07 23621 **Sampled: 06/08/2023 08:00** Sampler: Sean Murphy

Matrix: Drinking Water Description: GSF3-Effluent

Loc ID:

Analysis	Method	Analysis Due	Expires
pH for UV	SM5910 B-2000	06/15/2023 22:59	06/08/2023 08:14
UV254 SM5910-B	SM5910 B-2000	06/15/2023 22:59	06/10/2023 08:00

Released By	Date	Received By	Date
[illegible]	6/8/23	[illegible]	6/9 1008
Released By	Date	Received By	Date

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F0926

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/08/2023
Reported: 06/15/2023

Analytical Testing Parameters

Client Sample ID: HWWC - Raw
Sample Matrix: Drinking Water
Lab Sample ID: D3F0926-01
Collected By: Customer
Collection Date: 06/08/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**2.68**	0.500	mg/L	1	**Y1**	06/09/23 1226	06/10/23 0144	IMM

Client Sample ID: HWWC - Raw
Sample Matrix: Drinking Water
Lab Sample ID: D3F0926-02
Collected By: Customer
Collection Date: 06/08/2023 8:15

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**2.71**	0.500	mg/L	1	**Y1**	06/09/23 1230	06/09/23 1929	IMM

Client Sample ID: Slow Sand #1
Sample Matrix: Drinking Water
Lab Sample ID: D3F0926-03
Collected By: Customer
Collection Date: 06/08/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**1.34**	0.500	mg/L	1	**Y1**	06/09/23 1226	06/10/23 0247	IMM

Client Sample ID: Slow Sand #1
Sample Matrix: Drinking Water
Lab Sample ID: D3F0926-04
Collected By: Customer
Collection Date: 06/08/2023 8:15

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**1.35**	0.500	mg/L	1	**Y1**	06/09/23 1230	06/09/23 2032	IMM

Client Sample ID: Slow Sand #2
Sample Matrix: Drinking Water
Lab Sample ID: D3F0926-05
Collected By: Customer
Collection Date: 06/08/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**1.13**	0.500	mg/L	1	**Y1**	06/09/23 1226	06/10/23 0451	IMM

CERTIFICATE OF ANALYSIS

D3F0926

Client Sample ID:	Slow Sand #2		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0926-06	**Collection Date:**	06/08/2023 8:15

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**1.17**	0.500	mg/L	1	**Y1**	06/09/23 1230	06/09/23 2134	IMM

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0926-07	**Collection Date:**	06/08/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**1.21**	0.500	mg/L	1	**Y1**	06/09/23 1226	06/10/23 0523	IMM

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								
Benzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Bromobenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Bromochloromethane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Bromodichloromethane	**4.04**	0.50	ug/L	1			06/09/23 1210	IMM
Bromoform	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Methyl bromide	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
tert-Butylbenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
sec-Butylbenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
n-Butylbenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Carbon tetrachloride	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Chlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Chloroethane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Chloroform	**14.5**	0.50	ug/L	1			06/09/23 1210	IMM
Methyl chloride	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
2-Chlorotoluene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
4-Chlorotoluene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Chlorodibromomethane	**0.57**	0.50	ug/L	1			06/09/23 1210	IMM
Dibromomethane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,4-Dichlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,2-Dichlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,3-Dichlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Dichlorodifluoromethane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,2-Dichloroethane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,1-Dichloroethane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
trans-1,2-Dichloroethylene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
cis-1,2-Dichloroethylene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,1-Dichloroethene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,3-Dichloropropane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
2,2-Dichloropropane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,2-Dichloropropane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,1-Dichloropropene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
trans-1,3-Dichloropropylene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
cis-1,3-Dichloropropene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Ethylbenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Hexachlorobutadiene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Isopropylbenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
4-Isopropyltoluene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Methyl tert-butyl ether	<0.50	0.50	ug/L	1			06/09/23 1210	IMM

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0926-07
Collected By: Customer
Collection Date: 06/08/2023 8:15

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Methylene chloride	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Naphthalene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
n-Propylbenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Styrene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,1,1,2-Tetrachloroethane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,1,2,2-Tetrachloroethane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Tetrachloroethylene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Toluene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,2,4-Trichlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,2,3-Trichlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,1,1-Trichloroethane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,1,2-Trichloroethane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Trichloroethene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Trichlorofluoromethane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,2,3-Trichloropropane	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,2,4-Trimethylbenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
1,3,5-Trimethylbenzene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Vinyl chloride	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
m&p-xylene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
o-Xylene	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Xylenes (total)	<0.50	0.50	ug/L	1			06/09/23 1210	IMM
Surrogate: 4-Bromofluorobenzene	81.4	Limit: 70-130	% Rec	1			06/09/23 1210	IMM
Surrogate: 1,2-Dichlorobenzene-d4	85.2	Limit: 70-130	% Rec	1			06/09/23 1210	IMM

Client Sample ID: GSF - Influent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0926-08
Collected By: Customer
Collection Date: 06/08/2023 8:15

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**1.22**	0.500	mg/L	1	**Y1**	06/09/23 1230	06/09/23 2206	IMM

Client Sample ID:	GSF - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F0926-09	**Collection Date:**	06/08/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Total Organic Carbon (TOC)	**1.20**	0.500	mg/L	1	**Y1**	06/09/23 1226	06/10/23 0554	IMM

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 524.2, Rv. 4.1 (1995)								
Benzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Bromobenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Bromochloromethane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Bromodichloromethane	**4.22**	0.50	ug/L	1			06/09/23 1235	IMM
Bromoform	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Methyl bromide	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
tert-Butylbenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
sec-Butylbenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
n-Butylbenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Carbon tetrachloride	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Chlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Chloroethane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Chloroform	**16.1**	0.50	ug/L	1			06/09/23 1235	IMM
Methyl chloride	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
2-Chlorotoluene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
4-Chlorotoluene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Chlorodibromomethane	**0.61**	0.50	ug/L	1			06/09/23 1235	IMM
Dibromomethane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,4-Dichlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,2-Dichlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,3-Dichlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Dichlorodifluoromethane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,2-Dichloroethane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,1-Dichloroethane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
trans-1,2-Dichloroethylene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
cis-1,2-Dichloroethylene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,1-Dichloroethene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,3-Dichloropropane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
2,2-Dichloropropane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,2-Dichloropropane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,1-Dichloropropene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
trans-1,3-Dichloropropylene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
cis-1,3-Dichloropropene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Ethylbenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Hexachlorobutadiene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Isopropylbenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
4-Isopropyltoluene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Methyl tert-butyl ether	<0.50	0.50	ug/L	1			06/09/23 1235	IMM

Client Sample ID: GSF - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0926-09
Collected By: Customer
Collection Date: 06/08/2023 8:15

Volatile Organic Compounds by GCMS	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Methylene chloride	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Naphthalene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
n-Propylbenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Styrene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,1,1,2-Tetrachloroethane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,1,2,2-Tetrachloroethane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Tetrachloroethylene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Toluene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,2,4-Trichlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,2,3-Trichlorobenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,1,1-Trichloroethane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,1,2-Trichloroethane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Trichloroethene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Trichlorofluoromethane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,2,3-Trichloropropane	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,2,4-Trimethylbenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
1,3,5-Trimethylbenzene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Vinyl chloride	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
m&p-xylene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
o-Xylene	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Xylenes (total)	<0.50	0.50	ug/L	1			06/09/23 1235	IMM
Surrogate: 4-Bromofluorobenzene	85.4	Limit: 70-130	% Rec	1			06/09/23 1235	IMM
Surrogate: 1,2-Dichlorobenzene-d4	87.6	Limit: 70-130	% Rec	1			06/09/23 1235	IMM

Client Sample ID: GSF - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F0926-10
Collected By: Customer
Collection Date: 06/08/2023 8:15

Inorganics Dissolved	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
TOC-DW/SM 5310 C-2000								
Dissolved Organic Carbon (DOC)	**1.23**	0.500	mg/L	1	**Y1**	06/09/23 1230	06/09/23 2237	IMM

Definitions

MCL:	US EPA Maximum Contaminant Level
mg/L:	Milligrams per Liter
RL:	Reporting Limit
ug/L:	Micrograms per Liter
Y1:	Accreditation is not offered by the accrediting body for this analyte.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville
M-CT008 — Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/15/2023 15:29

Bno

D 3 F 0 9 2 6

NWSi - Northeast Water Solutions, inc.

MICROBAC

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

WWW.Microbac.com

Lab WO#: ____________

Project Manager: ____________

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TOC	DOC	VOC	Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	H3P04
HWWC - RAW	6/8/23	8:15		X	dw	4	x	x		X					X
Slow sand #1				X	dw	4	X	X		X					X
Slow sand #2				X	dw	4	X	X		X					X
GSF-Influent				X	dw	6	X	X	X	X	X				X
~~GSF1 Effluent~~				~~X~~	~~dw~~	~~4~~	~~X~~	~~X~~		X					X
~~gsf2-effluent~~				~~X~~	~~dw~~	~~4~~	~~X~~	~~X~~		X					X
~~gsf3-effluent~~				~~X~~	~~dw~~	~~4~~	~~X~~	~~X~~		X					X
GSF-Effluent			X		dw	62	X	X	X		X				

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER: [signature]	6/8/23	6/0:25
RECEIVED: [signature]	6/8/23	10:25
RELINQUISHED: [signature]	6/8/23	1504
RECEIVED: [signature]	6/8/23	1504
RELINQUISHED: [signature]	6-8-23	1800
RECEIVED: [signature]	6-8-23	1800

TURNAROUND (INDICATE IN CALENDAR DAYS): ____________ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS: ____________

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 17.8 °C Upon Receipt at LAB

2-4 °C

MICROBAC®

Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F1112

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/09/2023
Reported: 06/16/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1112-01
Collected By: Customer
Collection Date: 06/09/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/09/23 2057	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/09/23 2057	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/09/23 2057	AMF
SM 4500-H+ B-2000								
pH	**7.32**		S.U.	1	**H1**		06/09/23 2057	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/12/23 1214	06/12/23 1425	DLO
Iron	<0.0500	0.0500	mg/L	1		06/12/23 1214	06/12/23 1425	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1112-02
Collected By: Customer
Collection Date: 06/09/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1213	06/13/23 1933	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1112-03	**Collection Date:**	06/09/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<6.25	6.25	mg/L	3	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/09/23 2057	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/09/23 2057	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/09/23 2057	AMF
SM 4500-H+ B-2000								
pH	**7.29**		S.U.	1	**H1**		06/09/23 2057	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/12/23 1214	06/12/23 1437	DLO
Iron	<0.0500	0.0500	mg/L	1		06/12/23 1214	06/12/23 1437	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1112-04	**Collection Date:**	06/09/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1213	06/13/23 1937	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1112-05	**Collection Date:**	06/09/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/09/23 2057	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/09/23 2057	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/09/23 2057	AMF
SM 4500-H+ B-2000								
pH	**7.49**		S.U.	1	**H1**		06/09/23 2057	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/12/23 1214	06/12/23 1440	DLO
Iron	<0.0500	0.0500	mg/L	1		06/12/23 1214	06/12/23 1440	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1112-06	**Collection Date:**	06/09/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1213	06/13/23 1942	DLO

Client Sample ID:	GSF-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1112-07	**Collection Date:**	06/09/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**85.0**	1.00	mg CaCO3/L	1			06/12/23 1525	EMK

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1112-08	**Collection Date:**	06/09/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1	**A27**		06/12/23 1525	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/09/23 2057	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/09/23 2057	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/09/23 2057	AMF
SM 4500-H+ B-2000								
pH	**7.29**		S.U.	1	**H1**		06/09/23 2057	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00829**	0.00204	mg/L	1		06/12/23 1214	06/12/23 1445	DLO
Iron	<0.0500	0.0500	mg/L	1		06/12/23 1214	06/12/23 1445	DLO

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1112-09	**Collection Date:**	06/09/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1213	06/13/23 1946	DLO

Definitions

A27:	Headspace was present in the bottle used for the alkalinity analysis.
CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

M Montgomery

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/16/2023 14:22

BMD

D3F1112

NWSI - Northeast Water Solutions, inc.

MICROBAC

Lab WO#:

Project Manager:

WWW.Microbac.com

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

Copy of Report To

CUSTOMER: NWSI-Northeast Water Solutions
ADDRESS: 567 S County TRL
Exeter, RI 02822
ATTENTION: Robert Ferrari
E-MAIL: labreports@nwsi.net
PHONE: 401-667-7463

Billing Information (for credit card only)

BILL TO: same
ADDRESS:
ATTENTION:
TELEPHONE:
PURCHASE ORDER # :

Project Information

Project: Housatonic HWWC
Project Location: Housatonic MA
Project Manager
EMAIL: smurphy@nwsi.net
TELEPHONE:
Fax:

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric
GSF1- Effluent	6/9/2023	800		X	dw	3	x	x	x							X		X		
GSF2- Effluent	6/9/2023			X	dw	3	x	x	x							X		X		
GSF3 - Effluent				X	dw	3	x	x	x							X		X		
GSF-Effluent			X		dw	1				X						X				
GSF- Influent				X	dw	4	X	X	X	X						X		X		

CUSTODY TRANSFER (at drop off)		DATE	TIME
SAMPLER:	M Stewart	6/9/2023	800
RECEIVED:			
RELINQUISHED:	M Stewart	6/9/2023	918
RECEIVED:	C Reynolds	6/9/23	9:18
RELINQUISHED:	C Reynolds	6/9/23	1311
RECEIVED:	[illegible]	6/9/23	1311
	[illegible]	6-9-23	1717
	[illegible]	6-9-23	1717

TURNAROUND (INDICATE CALENDAR DAYS): HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

PRESERVATIVE VERIFIED Initials

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 18.3 °C Upon Receipt at LAB

2.9 °C

MICROBAC®

Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F1171

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/12/2023
Reported: 06/19/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1171-01
Collected By: Customer
Collection Date: 06/10/2023 22:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.48**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1208	06/13/23 1631	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1208	06/13/23 1631	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1171-02
Collected By: Customer
Collection Date: 06/10/2023 22:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1036	06/15/23 1443	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1171-03	**Collection Date:**	06/10/2023 22:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.52**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1208	06/13/23 1635	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1208	06/13/23 1635	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1171-04	**Collection Date:**	06/10/2023 22:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1036	06/15/23 1446	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1171-05	**Collection Date:**	06/10/2023 22:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.50**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1208	06/13/23 1639	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1208	06/13/23 1639	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1171-06	**Collection Date:**	06/10/2023 22:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1036	06/15/23 1450	DLO

Client Sample ID:	GSF-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1171-07	**Collection Date:**	06/10/2023 22:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/13/23 2100	EMK

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1171-08	**Collection Date:**	06/10/2023 22:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/13/23 2100	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.28**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00703**	0.00204	mg/L	1		06/13/23 1208	06/13/23 1644	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1208	06/13/23 1644	DLO

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1171-09	**Collection Date:**	06/10/2023 22:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1036	06/15/23 1501	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/19/2023 15:59

MICROBAC

Chain of Custody

D3F1171

NWSI - Northeast Water Solutions, inc.

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

WWW.Microbac.com

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric
GSF1- Effluent	6/10/2023	22:00		X	dw	3	x	x	x							X		X		
GSF2- Effluent	|	|		X	dw	3	x	x	x							X		X		
GSF3 - Effluent	|	|		X	dw	3	x	x	x							X		X		
GSF-Effluent	|	|	X		dw	1				X						X				
GSF- Influent	|	|		X	dw	4	X	X	X	X						X		X		

PRESERVATIVE VERIFIED Initials [signature]

CUSTODY TRANSFER (at drop off)		DATE	TIME
SAMPLER:	M Atwart	6/10/2023	22:00
RECEIVED:			
RELINQUISHED:	M Atwart	6/12/2023	0900
RECEIVED:	C Reynolds	6/12/23	9:00
RELINQUISHED:	C Reynolds	6/12/23	1130
RECEIVED:	[signature]	6/12/23	1130
	[signature]	6/12/23	1714
	[signature]	6/12/23	1714

TURNAROUND (INDICATE IN CALENDAR DAYS): ______ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☑ COOLED ☐ AMBIENT 6.5 C Upon Receipt at LAB

2.7 °C

MICROBAC®

Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F1172

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/12/2023
Reported: 06/19/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1172-01
Collected By: Customer
Collection Date: 06/11/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.49**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1210	06/13/23 1716	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1210	06/13/23 1716	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1172-02
Collected By: Customer
Collection Date: 06/11/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1036	06/15/23 1505	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1172-03	**Collection Date:**	06/11/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.46**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1210	06/13/23 1721	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1210	06/13/23 1721	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1172-04	**Collection Date:**	06/11/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1036	06/15/23 1508	DLO

Client Sample ID: GSF3 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1172-05
Collected By: Customer
Collection Date: 06/11/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.48**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1210	06/13/23 1725	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1210	06/13/23 1725	DLO

Client Sample ID: GSF3 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1172-06
Collected By: Customer
Collection Date: 06/11/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1036	06/15/23 1512	DLO

Client Sample ID: GSF-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1172-07
Collected By: Customer
Collection Date: 06/11/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/13/23 2100	EMK

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1172-08	**Collection Date:**	06/11/2023 8:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/13/23 2100	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.27**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00740**	0.00204	mg/L	1		06/13/23 1210	06/13/23 1729	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1210	06/13/23 1729	DLO

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1172-09	**Collection Date:**	06/11/2023 8:10

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00283**	0.00204	mg/L	1		06/15/23 1036	06/15/23 1524	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/19/2023 16:00

BMO

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Chain of Custody

D 3 F 1 1 7 2

NWSI - Northeast Water Solutions, Inc.

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

WWW.Microbac.com

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	
GSF1- Effluent	6/11/2023	0810		X	dw	3	x	x	x							X		X			
GSF2- Effluent				X	dw	3	x	x	x							X		X			
GSF3 - Effluent				X	dw	3	x	x	x							X		X			
GSF-Effluent			X		dw	1				X						X					
GSF- Influent				X	dw	4	X	X	X	X						X		X			

PRESERVATIVE VERIFIED Initials WK

CUSTODY TRANSFER (at drop off)		DATE	TIME
SAMPLER:	M Stewart	6/11/2023	0810
RECEIVED:			
RELINQUISHED:	M Stewart	6/12/2023	0900
RECEIVED:	C Reynolds	6/12/23	900
RELINQUISHED:	C Reynolds	6/12/23	1130
RECEIVED:	[illegible]	6/12/23	1120
	[illegible]	6/12/23	1714
	[illegible]	6/12/23	1714

TURNAROUND (INDICATE IN CALENDAR DAYS): _____ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☑ COOLED ☐ AMBIENT 6.7 °C Upon Receipt at LAB

2.9 °C WK

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F1173

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/12/2023
Reported: 06/19/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1173-01
Collected By: Customer
Collection Date: 06/12/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.24**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1210	06/13/23 1733	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1210	06/13/23 1733	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1173-02
Collected By: Customer
Collection Date: 06/12/2023 8:15

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1036	06/15/23 1528	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1173-03	**Collection Date:**	06/12/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.47**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1210	06/13/23 1746	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1210	06/13/23 1746	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1173-04	**Collection Date:**	06/12/2023 8:15

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1036	06/15/23 1532	DLO

CERTIFICATE OF ANALYSIS

D3F1173

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1173-05	**Collection Date:**	06/12/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<6.25	6.25	mg/L	3	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.45**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/13/23 1210	06/13/23 1750	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1210	06/13/23 1750	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1173-06	**Collection Date:**	06/12/2023 8:15

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1036	06/15/23 1536	DLO

Client Sample ID:	GSF-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1173-07	**Collection Date:**	06/12/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/13/23 2100	EMK

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1173-08	**Collection Date:**	06/12/2023 8:15

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**85.0**	1.00	mg CaCO3/L	1			06/13/23 2100	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<2.78	2.78	mg/L	1	**Y**	06/13/23 1705	06/14/23 1630	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/12/23 2025	EMK
Color, Apparent	<1	1	CU	1	**Y**		06/12/23 2025	EMK
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/12/23 2025	EMK
SM 4500-H+ B-2000								
pH	**7.28**		S.U.	1	**H1**		06/12/23 2025	EMK

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00672**	0.00204	mg/L	1		06/13/23 1210	06/13/23 1755	DLO
Iron	<0.0500	0.0500	mg/L	1		06/13/23 1210	06/13/23 1755	DLO

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1173-09	**Collection Date:**	06/12/2023 8:15

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1036	06/15/23 1550	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/19/2023 16:01

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Chain of Custody

WWW.Microbac.com

D3F1173

NWSi - Northeast Water Solutions, inc.

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric
GSF1- Effluent	6/12/2023	815		X	dw	3	x	x	x							X		X		
GSF2- Effluent	/	/		X	dw	3	x	x	x							X		X		
GSF3 - Effluent	/	/		X	dw	3	x	x	x							X		X		
GSF-Effluent	/	/	X		dw	1				X						X				
GSF- Influent				X	dw	4	X	X	X	X						X		X		

PRESERVATIVE VERIFIED Initials ____ (initials)

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER: M Stewart	6/12/2023	815
RECEIVED:		
RELINQUISHED: M Stewart	6/12/2023	0900
RECEIVED: C Reynolds	6/12/23	9:00
RELINQUISHED: C Reynolds	6/12/23	1130
RECEIVED: [illegible signature]	6/12/23	1130
[signature]	6/12/23	1714
[signature]	6/12/23	1714

TURNAROUND (INDICATE IN CALENDAR DAYS): ____ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☑ AMBIENT 19.5 °C Upon Receipt at LAB

2.8 °C (initials)

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F1279

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/13/2023
Reported: 06/20/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1279-01
Collected By: Customer
Collection Date: 06/13/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/14/23 1905	06/15/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/13/23 2136	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/13/23 2136	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/13/23 2136	AMF
SM 4500-H+ B-2000								
pH	**7.27**		S.U.	1	**H1**		06/13/23 2136	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/14/23 1035	06/14/23 1231	DLO
Iron	<0.0500	0.0500	mg/L	1		06/14/23 1035	06/14/23 1231	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1279-02
Collected By: Customer
Collection Date: 06/13/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1038	06/15/23 1634	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1279-03	**Collection Date:**	06/13/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/14/23 1905	06/15/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/13/23 2136	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/13/23 2136	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/13/23 2136	AMF
SM 4500-H+ B-2000								
pH	**7.27**		S.U.	1	**H1**		06/13/23 2136	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/14/23 1035	06/14/23 1235	DLO
Iron	<0.0500	0.0500	mg/L	1		06/14/23 1035	06/14/23 1235	DLO

Client Sample ID:	GSF2 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1279-04	**Collection Date:**	06/13/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1038	06/15/23 1637	DLO

Client Sample ID: GSF3 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1279-05
Collected By: Customer
Collection Date: 06/13/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<6.25	6.25	mg/L	3	Y	06/14/23 1905	06/15/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	Y		06/13/23 2136	AMF
Color, Apparent	<1	1	CU	1	Y		06/13/23 2136	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/13/23 2136	AMF
SM 4500-H+ B-2000								
pH	**7.26**		S.U.	1	H1		06/13/23 2136	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/14/23 1035	06/14/23 1246	DLO
Iron	<0.0500	0.0500	mg/L	1		06/14/23 1035	06/14/23 1246	DLO

Client Sample ID: GSF3 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1279-06
Collected By: Customer
Collection Date: 06/13/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1038	06/15/23 1641	DLO

Client Sample ID: GSF-Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1279-07
Collected By: Customer
Collection Date: 06/13/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**85.0**	1.00	mg CaCO3/L	1			06/15/23 1550	EMK

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1279-08	**Collection Date:**	06/13/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/15/23 1550	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/14/23 1905	06/15/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/13/23 2136	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/13/23 2136	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/13/23 2136	AMF
SM 4500-H+ B-2000								
pH	**7.29**		S.U.	1	**H1**		06/13/23 2136	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00613**	0.00204	mg/L	1		06/14/23 1035	06/14/23 1249	DLO
Iron	<0.0500	0.0500	mg/L	1		06/14/23 1035	06/14/23 1249	DLO

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Customer
Lab Sample ID:	D3F1279-09	**Collection Date:**	06/13/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1038	06/15/23 1645	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville	
M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/20/2023 11:16

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Chain of Custody

D 3 F 1 2 7 9

NWSI - Northeast Water Solutions, Inc.

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

WWW.Microbac.com

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity					Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	
GSF1- Effluent	6/13/2023	0800		X	dw	3	x	x	x						X		X			
GSF2- Effluent	"	"		X	dw	3	x	x	x						X		X			
GSF3 - Effluent	"	"		X	dw	3	x	x	x						X		X			
GSF-Effluent	"	"	X		dw	1				X					X					
GSF- Influent	"	"		X	dw	4	X	X	X	X					X		X			

PRESERVATIVE VERIFIED Initials

TURNAROUND (ESTIMATE IN CALENDAR DAYS): HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

CUSTODY TRANSFER (at drop off)		DATE	TIME
SAMPLER:	M Stewart	6/13/2023	0800
RECEIVED:			
RELINQUISHED:	M Stewart	6/13/2023	0905
RECEIVED:	[illegible]	6/13/23	905
RELINQUISHED:	[illegible]	6/13/23	1351
RECEIVED:	[illegible]	6/13/23	1351
	[illegible]	6-13-23	1726
	[illegible]	6/13/23	1726

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 9.8 °C Upon Receipt at LAB 3.1°C at

MICROBAC®

Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F1535

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/14/2023
Reported: 06/21/2023

Analytical Testing Parameters

Client Sample ID: GSF1 Backwash 2 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1535-01
Collected By: Mike Stewart
Collection Date: 06/14/2023 9:50

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**20.0**	10.0	mg/L	4		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**59.5**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**6.08**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1520	DLO

Client Sample ID: GSF1 Backwash 4 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1535-02
Collected By: Mike Stewart
Collection Date: 06/14/2023 9:52

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**12.4**	10.0	mg/L	4		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**54.6**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**3.48**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1524	DLO

Client Sample ID: GSF1 Backwash 6 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1535-03
Collected By: Mike Stewart
Collection Date: 06/14/2023 9:54

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**8.80**	5.00	mg/L	2		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**49.7**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**2.29**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1528	DLO

Client Sample ID: GSF1 Backwash 8 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1535-04
Collected By: Mike Stewart
Collection Date: 06/14/2023 9:56

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**7.20**	5.00	mg/L	2		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**45.1**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**2.03**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1538	DLO

Client Sample ID: GSF1 Backwash 10 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1535-05
Collected By: Mike Stewart
Collection Date: 06/14/2023 9:58

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**5.88**	2.78	mg/L	1		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**44.4**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.93**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1542	DLO

Client Sample ID: GSF1 Backwash 12 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1535-06
Collected By: Mike Stewart
Collection Date: 06/14/2023 10:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**6.33**	2.78	mg/L	1		06/15/23 2055	06/16/23 1840	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**41.3**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.63**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1553	DLO

Client Sample ID: GSF1 Backwash 14 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1535-07
Collected By: Mike Stewart
Collection Date: 06/14/2023 10:02

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**6.22**	2.78	mg/L	1		06/15/23 2055	06/16/23 1840	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**42.2**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.88**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1557	DLO

Client Sample ID: GSF1 Backwash 16 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1535-08
Collected By: Mike Stewart
Collection Date: 06/14/2023 10:04

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**6.33**	2.78	mg/L	1		06/15/23 2055	06/16/23 1840	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**41.8**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.80**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1600	DLO

Client Sample ID: GSF1 Backwash 18 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1535-09
Collected By: Mike Stewart
Collection Date: 06/14/2023 10:06

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**6.00**	3.13	mg/L	1		06/15/23 2055	06/16/23 1840	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**41.5**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.68**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1604	DLO

Client Sample ID: GSF1 Backwash 20 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1535-10
Collected By: Mike Stewart
Collection Date: 06/14/2023 10:08

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**5.22**	2.78	mg/L	1		06/15/23 2055	06/16/23 1840	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**39.9**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.19**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1608	DLO

Client Sample ID: GSF1 Backwash 22 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1535-11
Collected By: Mike Stewart
Collection Date: 06/14/2023 10:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**5.88**	2.78	mg/L	1		06/15/23 2055	06/16/23 1840	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**40.5**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.78**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1612	DLO

Definitions

MCL:	US EPA Maximum Contaminant Level
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
Y1:	Accreditation is not offered by the accrediting body for this analyte.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/21/2023 15:04

MICROBAC®

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5(

D 3 F 1 5 3 5

NWSI - Northeast Water Solutions, Inc.

Lab WO#:

Project Manager:

BMD

Copy of Report To		Bil		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	Total Mn	Analysis: TSS, Turbidity	Preservatives: Non-pres	Preservatives: HCL	Preservatives: HNO3	Preservatives: NH4Cl	Preservatives: Sulfuric
GSF 1 Backwash 2 min.	6/14/2023	0950		X	aq	2	X	X	X		X		
GSF 1 Backwash 4 Min		0952		X	aq	2	X	X	X		X		
GSF 1 Backwash 6 Min.		0954		X	aq	2	X	X	X		X		
GSF 1 Backwash 8 Min		0956		X	aq	2	X	X	X		X		
GSF 1 Backwash 10 min		0958		X	aq	2	X	X	X		X		
GSF 1 Backwash 12 Min		1000		X	aq	2	X	X	X		X		
GSF 1 Backwash 14 min		1002		X	aq	2	X	X	X		X		
GSF 1 Backwash 16 min		1004		X	aq	2	X	X	X		X		
GSF 1 Backwash 18 min		1006		X	aq	2	X	X	X		X		
GSF 1 Backwash 20 Min		1008		X	aq	2	X	X	X		X		
GSF 1 Backwash 22 min		1010		X	aq	2	X	X	X		X		

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER: M Stewart	6/14/2023	1010
RECEIVED:		
RELINQUISHED: M Stewart	6/14/2023	14:40
RECEIVED:	6/14/23	14:40
RELINQUISHED:		
RECEIVED:		

TURNAROUND (INDICATE IN CALENDAR DAYS):

HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 19.9 °C Upon Receipt at LAB

WI-L-004r3

3/26/2021

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F1536

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/14/2023
Reported: 06/21/2023

Analytical Testing Parameters

Client Sample ID: GSF2 Backwash 2 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1536-01
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**28.4**	10.0	mg/L	4		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**82.5**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**6.27**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1651	DLO

Client Sample ID: GSF2 Backwash 4 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1536-02
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:32

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**15.2**	10.0	mg/L	4		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**57.1**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**4.76**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1655	DLO

Client Sample ID: GSF2 Backwash 6 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1536-03
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:34

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**10.2**	5.00	mg/L	2		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**49.0**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**2.83**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1658	DLO

Client Sample ID: GSF2 Backwash 8 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1536-04
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:36

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**8.40**	5.00	mg/L	2		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**42.5**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**2.65**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1709	DLO

Client Sample ID: GSF2 Backwash 10 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1536-05
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:38

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**7.66**	2.78	mg/L	1		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**38.9**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**2.03**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1713	DLO

Client Sample ID: GSF2 Backwash 12 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1536-06
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:40

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**5.88**	2.78	mg/L	1		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**34.1**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.68**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1717	DLO

Client Sample ID: GSF2 Backwash 14 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1536-07
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:42

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.55**	2.78	mg/L	1		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**30.5**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.50**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1720	DLO

Client Sample ID: GSF2 Backwash 16 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1536-08
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:44

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.88**	3.13	mg/L	1		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**32.5**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.69**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1724	DLO

Client Sample ID: GSF2 Backwash 18 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1536-09
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:46

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.77**	2.78	mg/L	1		06/15/23 2055	06/16/23 1840	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**31.7**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.48**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1727	DLO

Client Sample ID: GSF2 Backwash 20 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1536-10
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:48

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.88**	2.78	mg/L	1		06/15/23 1655	06/16/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**31.3**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.37**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1740	DLO

Client Sample ID: GSF2 Backwash 22 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1536-11
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:50

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.33**	2.78	mg/L	1		06/15/23 1655	06/16/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**29.5**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.988**	0.00200	mg/L	1		06/16/23 1500	06/19/23 1743	DLO

Definitions

MCL:	US EPA Maximum Contaminant Level
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
Y1:	Accreditation is not offered by the accrediting body for this analyte.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/21/2023 15:04

BNO

MICROBAC®

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5(

D 3 F 1 5 3 6

NWSI - Northeast Water Solutions, inc.

Lab WO#:

Project Manager:

Copy of Report To		E		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	Total Mn	Analysis: TSS, Turbidity	Preservatives: Non-pres	Preservatives: HCL	Preservatives: HNO3	Preservatives: NH4Cl	Preservatives: Sulfuric
GSF 2 Backwash 2 min.	6/14/2023	08:30		X	aq	2	X	X	X		X		
GSF 2 Backwash 4 Min		08:32		X	aq	2	X	X	X		X		
GSF 2 Backwash 6 Min.		08:34		X	aq	2	X	X	X		X		
GSF 2 Backwash 8 Min		08:36		X	aq	2	X	X	X		X		
GSF 2 Backwash 10 min		08:38		X	aq	2	X	X	X		X		
GSF 2 Backwash 12 Min		08:40		X	aq	2	X	X	X		X		
GSF 2 Backwash 14 min		08:42		X	aq	2	X	X	X		X		
GSF 2 Backwash 16 min		08:44		X	aq	2	X	X	X		X		
GSF 2 Backwash 18 min		08:46		X	aq	2	X	X	X		X		
GSF 2 Backwash 20 Min		08:48		X	aq	2	X	X	X		X		
GSF 2 Backwash 22 min		08:50		X	aq	2	X	X	X		X		

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/14/2023	0850
RECEIVED:		
RELINQUISHED:		
RECEIVED:	6/14/23	14:40
RELINQUISHED:		
RECEIVED:		

TURNAROUND (INDICATE IN CALENDAR DAYS):

HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 18.5 °C Upon Receipt at LAB

WI-L-004r3

3/26/2021

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F1537

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/14/2023
Reported: 06/22/2023

Analytical Testing Parameters

Client Sample ID: GSF3 Backwash 2 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1537-01
Collected By: Customer
Collection Date: 06/14/2023 9:10

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**23.2**	10.0	mg/L	4		06/15/23 1655	06/16/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**71.7**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**7.77**	0.00200	mg/L	1		06/19/23 1500	06/20/23 2322	DLO

Client Sample ID: GSF3 Backwash 4 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1537-02
Collected By: Customer
Collection Date: 06/14/2023 9:12

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**8.60**	5.00	mg/L	2		06/15/23 1655	06/16/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**45.4**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**2.36**	0.00200	mg/L	1		06/19/23 1500	06/20/23 2326	DLO

Client Sample ID:	GSF3 Backwash 6 Min.		
Sample Matrix:	Aqueous	**Collected By:**	Customer
Lab Sample ID:	D3F1537-03	**Collection Date:**	06/14/2023 9:14

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**6.00**	5.00	mg/L	2		06/15/23 1655	06/16/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**36.9**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.800**	0.00200	mg/L	1		06/19/23 1500	06/20/23 2331	DLO

Client Sample ID:	GSF3 Backwash 8 Min.		
Sample Matrix:	Aqueous	**Collected By:**	Customer
Lab Sample ID:	D3F1537-04	**Collection Date:**	06/14/2023 9:16

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**5.00**	2.78	mg/L	1		06/15/23 1655	06/16/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**34.2**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.93**	0.00200	mg/L	1		06/19/23 1500	06/20/23 2344	DLO

Client Sample ID:	GSF3 Backwash 10 Min.		
Sample Matrix:	Aqueous	**Collected By:**	Customer
Lab Sample ID:	D3F1537-05	**Collection Date:**	06/14/2023 9:18

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**5.66**	2.78	mg/L	1		06/15/23 1655	06/16/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2130 B-2011								
Turbidity	**36.4**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.89**	0.00200	mg/L	1		06/19/23 1500	06/20/23 2348	DLO

Client Sample ID: GSF3 Backwash 12 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1537-06
Collected By: Customer
Collection Date: 06/14/2023 9:20

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**3.89**	2.78	mg/L	1		06/15/23 1655	06/16/23 1810	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**29.0**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.20**	0.00200	mg/L	1		06/19/23 1500	06/20/23 2352	DLO

Client Sample ID: GSF3 Backwash 14 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1537-07
Collected By: Customer
Collection Date: 06/14/2023 9:22

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.11**	2.78	mg/L	1		06/15/23 1655	06/16/23 1810	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**27.5**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.30**	0.00200	mg/L	1		06/19/23 1500	06/20/23 2356	DLO

Client Sample ID: GSF3 Backwash 16 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1537-08
Collected By: Customer
Collection Date: 06/14/2023 9:24

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.75**	3.13	mg/L	1		06/15/23 1655	06/16/23 1810	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**30.1**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.43**	0.00200	mg/L	1		06/19/23 1500	06/21/23 0001	DLO

Client Sample ID: GSF3 Backwash 18 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1537-09
Collected By: Customer
Collection Date: 06/14/2023 9:26

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.55**	2.78	mg/L	1		06/15/23 1655	06/16/23 1810	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**27.4**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.45**	0.00200	mg/L	1		06/19/23 1500	06/21/23 0005	DLO

Client Sample ID: GSF3 Backwash 20 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1537-10
Collected By: Customer
Collection Date: 06/14/2023 9:28

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.33**	2.78	mg/L	1		06/15/23 1655	06/16/23 1810	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**27.4**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.47**	0.00200	mg/L	1		06/19/23 1500	06/21/23 0018	DLO

Client Sample ID: GSF3 Backwash 22 Min.
Sample Matrix: Aqueous
Lab Sample ID: D3F1537-11
Collected By: Customer
Collection Date: 06/14/2023 9:30

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-W/SM 2540 D-2015								
Total Suspended Solids (TSS)	**4.66**	2.78	mg/L	1		06/15/23 1655	06/16/23 1810	AJD
General Parameters	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
SM 2130 B-2011								
Turbidity	**29.0**	0.100	NTU	1	**Y1**		06/14/23 2147	AMF
Metals Total by ICP	**Result**	**RL**	**Units**	**DF**	**Note**	**Prepared**	**Analyzed**	**Analyst**
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**1.44**	0.00200	mg/L	1		06/19/23 1500	06/21/23 0022	DLO

Definitions

MCL:	US EPA Maximum Contaminant Level
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
Y1:	Accreditation is not offered by the accrediting body for this analyte.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/22/2023 15:36

MICROBAC®

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5(

D 3 F 1 5 3 7

NWSI - Northeast Water Solutions, Inc.

Lab WO#:

Project Manager:

BMD

Copy of Report To

CUSTOMER: NWSI-Northeast Water Solutions
ADDRESS: 567 S County TRL
Exeter, RI 02822
ATTENTION: Robert Ferrari
E-MAIL: labreports@nwsi.net
PHONE: 401-667-7463

Billing Information (for credit card only)

BILL TO: same
ADDRESS:
ATTENTION:
TELEPHONE:
PURCHASE ORDER # :

Project Information

Project: Housatonic HWWC
Project Location: Housatonic MA
Project Manager:
EMAIL: smurphy@nwsi.net
TELEPHONE:
Fax:

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	Analysis: Total Mn	Analysis: TSS, Turbidity	Preservatives: Non-pres	Preservatives: HCL	Preservatives: HNO3	Preservatives: NH4Cl	Preservatives: Sulfuric
GSF 3 Backwash 2 min.	6/14/2023	0910		X	aq	2	X	X	X		X		
GSF 3 Backwash 4 Min		0912		X	aq	2	X	X	X		X		
GSF 3 Backwash 6 Min.		0914		X	aq	2	X	X	X		X		
GSF 3 Backwash 8 Min		0916		X	aq	2	X	X	X		X		
GSF 3 Backwash 10 min		0918		X	aq	2	X	X	X		X		
GSF 3 Backwash 12 Min		0920		X	aq	2	X	X	X		X		
GSF 3 Backwash 14 min		0922		X	aq	2	X	X	X		X		
GSF 3 Backwash 16 min		0924		X	aq	2	X	X	X		X		
GSF 3 Backwash 18 min		0926		X	aq	2	X	X	X		X		
GSF 3 Backwash 20 Min		0928		X	aq	2	X	X	X		X		
GSF 3 Backwash 22 min		0930		X	aq	2	X	X	X		X		

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER: M Stewart	6/14/2023	0930
RECEIVED:		
RELINQUISHED: M Stewart	6/14/2023	14:40
RECEIVED:	6/14/23	14:40
RELINQUISHED:		
RECEIVED:		

TURNAROUND (INDICATE IN CALENDAR DAYS):

HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 16.5 °C Upon Receipt at LAB

WI-L-004r3

3/26/2021

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Microbac Laboratories, Inc. - Dayville

CERTIFICATE OF ANALYSIS

D3F1539

Northeast Water Solutions, Inc

Robert Ferrari
567 S County TRL
Exeter, RI 02822

Project Name: HWWC

Project / PO Number: N/A
Received: 06/14/2023
Reported: 06/22/2023

Analytical Testing Parameters

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1539-01
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/14/23 1905	06/15/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/14/23 2147	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/14/23 2147	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/14/23 2147	AMF
SM 4500-H+ B-2000								
pH	**7.62**		S.U.	1	**H1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1038	06/15/23 1729	DLO
Iron	<0.0500	0.0500	mg/L	1		06/15/23 1038	06/15/23 1729	DLO

Client Sample ID: GSF1 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1539-02
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/20/23 1252	06/20/23 2156	DLO

Client Sample ID: GSF2 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1539-03
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/14/23 1905	06/15/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/14/23 2147	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/14/23 2147	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/14/23 2147	AMF
SM 4500-H+ B-2000								
pH	**7.67**		S.U.	1	**H1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1038	06/15/23 1733	DLO
Iron	<0.0500	0.0500	mg/L	1		06/15/23 1038	06/15/23 1733	DLO

Client Sample ID: GSF2 - Effluent
Sample Matrix: Drinking Water
Lab Sample ID: D3F1539-04
Collected By: Mike Stewart
Collection Date: 06/14/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/20/23 1252	06/20/23 2200	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Mike Stewart
Lab Sample ID:	D3F1539-05	**Collection Date:**	06/14/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/14/23 1905	06/15/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/14/23 2147	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/14/23 2147	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/14/23 2147	AMF
SM 4500-H+ B-2000								
pH	**7.66**		S.U.	1	**H1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/15/23 1038	06/15/23 1744	DLO
Iron	<0.0500	0.0500	mg/L	1		06/15/23 1038	06/15/23 1744	DLO

Client Sample ID:	GSF3 - Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Mike Stewart
Lab Sample ID:	D3F1539-06	**Collection Date:**	06/14/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/20/23 1252	06/20/23 2204	DLO

Client Sample ID:	GSF-Effluent		
Sample Matrix:	Drinking Water	**Collected By:**	Mike Stewart
Lab Sample ID:	D3F1539-07	**Collection Date:**	06/14/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/15/23 1840	EMK

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Mike Stewart
Lab Sample ID:	D3F1539-08	**Collection Date:**	06/14/2023 8:00

Inorganics Total	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2320 B-1997								
Alkalinity to pH 4.5, Total	**80.0**	1.00	mg CaCO3/L	1			06/15/23 1840	EMK
Wet-Solids-DW/SM 2540 D-1997								
Total Suspended Solids (TSS)	<3.13	3.13	mg/L	1	**Y**	06/14/23 1905	06/15/23 1810	AJD

General Parameters	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
SM 2120 B-2001								
Color	**0**		CU	1	**Y**		06/14/23 2147	AMF
Color, Apparent	<1	1	CU	1	**Y**		06/14/23 2147	AMF
SM 2130 B-2001								
Turbidity	<0.100	0.100	NTU	1			06/14/23 2147	AMF
SM 4500-H+ B-2000								
pH	**7.60**		S.U.	1	**H1**		06/14/23 2147	AMF

Metals Total by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	**0.00361**	0.00204	mg/L	1		06/15/23 1038	06/15/23 1747	DLO
Iron	<0.0500	0.0500	mg/L	1		06/15/23 1038	06/15/23 1747	DLO

Client Sample ID:	GSF - Influent		
Sample Matrix:	Drinking Water	**Collected By:**	Mike Stewart
Lab Sample ID:	D3F1539-09	**Collection Date:**	06/14/2023 8:00

Metals Dissolved by ICP	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 200.7, Rv. 4.4 (1994)								
Manganese	<0.00204	0.00204	mg/L	1		06/20/23 1252	06/20/23 2209	DLO

Definitions

CU:	Color Unit
H1:	Sample was received past holding time.
MCL:	US EPA Maximum Contaminant Level
mg CaCO3/L	Milligrams Calcium Carbonate per Liter
mg/L:	Milligrams per Liter
NTU:	Nephelometric Turbidity Units
RL:	Reporting Limit
S.U.:	Standard Units
SMCL:	US EPA Secondary Maximum Contaminant Level
Y:	This analyte is not on the laboratory's current scope of accreditation.

Project Requested Certification(s)

Microbac Laboratories, Inc. - Dayville

M-CT008	Massachusetts Department of Environmental Protection

Report Comments

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Reviewed and Approved By:

Melisa L. Montgomery
Quality Assurance Officer
Reported: 06/22/2023 15:36

D 3 F 1 5 3 9

BMO

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Chain of Custody

NWSI - Northeast Water Solutions, Inc.

80 Run Way
Lee, MA 01238 (413) 776-5025 fax: 413-776-5029

WWW.Microbac.com

Project Manager: _____

Copy of Report To		Billing Information (for credit card only)		Project Information	
CUSTOMER:	NWSI-Northeast Water Solutions	BILL TO:	same	Project:	Housatonic HWWC
ADDRESS:	567 S County TRL	ADDRESS:		Project Location:	Housatonic MA
	Exeter, RI 02822			Project Manager	
ATTENTION:	Robert Ferrari	ATTENTION:		EMAIL:	smurphy@nwsi.net
E-MAIL:	labreports@nwsi.net	TELEPHONE:		TELEPHONE:	
PHONE:	401-667-7463	PURCHASE ORDER # :		Fax:	

Sample Identification	Date Collected	Time Collected	Sample Type: COMPOSITE	Sample Type: GRAB	Sample Matrix	# of containers	TSS, Color, Turbidity	Soluble Mn	Fe/Mn	Alkalinity						Preservatives: Non-pres	HCL	HNO3	NH4Cl	Sulfuric	
GSF1- Effluent	6/14/2023	0800		X	dw	3	x	x	x							X		X			
GSF2- Effluent				X	dw	3	x	x	x							X		X			
GSF3 - Effluent				X	dw	3	x	x	x							X		X			
GSF-Effluent			X		dw	1				X						X					
GSF- Influent				X	dw	4	X	X	X	X						X		X			

CUSTODY TRANSFER (at drop off)	DATE	TIME
SAMPLER:	6/14/2023	0800
RECEIVED:		
RELINQUISHED:	6/14/2023	1440
RECEIVED:	6/14/23	1440
RELINQUISHED:		
RECEIVED:		

TURNAROUND (INDICATE IN CALENDAR DAYS): _____ HARD COPY or E-MAIL

EXPEDITED SERVICE MAY BE SUBJECT TO SURCHARGE

COMMENTS:

Cash Check# Auth#:

Please do not list credit card numbr on paperwork

CONDITIONS UPON RECEIPT: (CHECK ONE)

☐ COOLED ☐ AMBIENT 19.1 °C Upon Receipt at LAB