10 October 2022

Mr. Scott Sokolowski
Remedial Project Manager
Naval Facilities Engineering Systems Command, Mid-Atlantic
9324 Virginia Avenue, Building Z-144
Norfolk, VA 23511-3095

Subject: **September 2022 Monthly Operating Report**
Full Scale Liquid-Phase Granular Activated Carbon Treatment System
Liberty New York Water, Seamans Neck Road Water Plant
NWIRP Bethpage, New York
Contract No. N40085-16-D-2288, Task Order N4008518F5125

Dear Mr. Sokolowski,

The Full Scale Liquid-Phase Granulated Activated Carbon (GAC) Treatment System is located at the Liberty New York Water (LNYW) Seamans Neck Road Water Plant in Levittown, NY. The GAC System was installed at the effluent of the potable water plant and consists of six GAC vessels operating in parallel to remove low levels of trichloroethene (TCE) from Well No. 3S and Well No. 4S. After processing through the GAC units, the water is treated with sodium hypochlorite and sodium tripolyphosphate before distribution. Startup of the GAC Treatment System occurred on 8 January 2015 by CH2MHill. KOMAN Government Solutions, LLC (KGS) began operation and maintenance (O&M) activities in March 2015.

In May 2018, production Well No. 3S was decommissioned and has been replaced with a new production well designated as Well No. 3A. Well No. 4S is normally in operation during the entire month, while well No. 3A is operated infrequently, typically during the periods of higher water demand.

This report documents the routine operation and maintenance of the GAC System performed during the month of September 2022. **Attachment 1** presents the field logs detailing system operating data as recorded during the month. These readings include flow rate and total flows of the overall GAC System and each GAC unit, pressures across the GAC System, effluent chlorine residual and pH values, chemical usage levels of sodium hypochlorite and sodium tripolyphosphate for each chemical tank, and chemical metering pump settings and pressures.

Electricity use is no longer monitored and recorded using the Leviton Series 2000 Multiple Meter Unit. Summary energy consumption reports will be provided separately to the Navy representative.

A summary of the system operating data recorded in September 2022 is presented below in **Table 1**.

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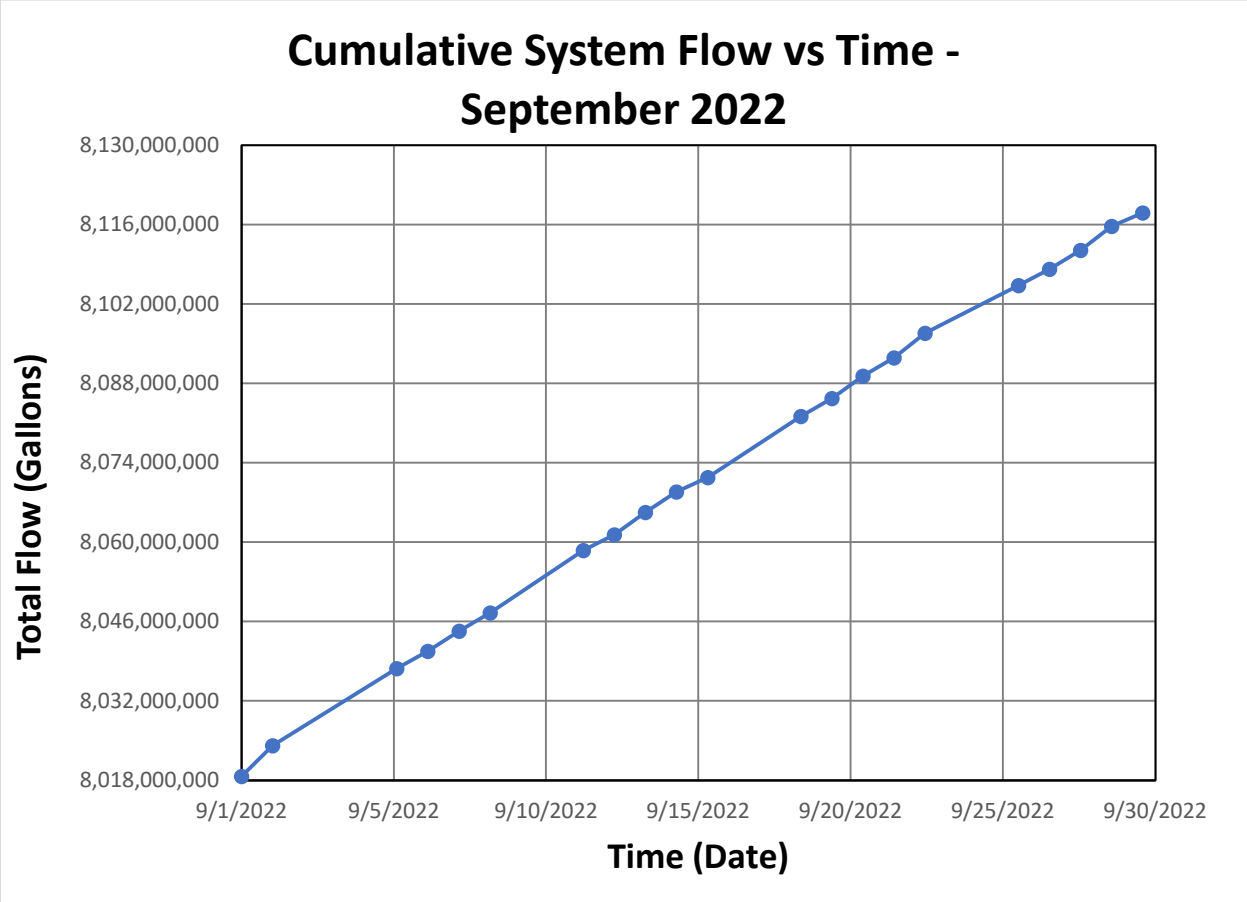
Table 1 - ***System Operating Data for September 2022***

Date	Total Flow	Flow Rate	Influent Pressure	Effluent Pressure	Differential Pressure	Effluent Chlorine Residual	Effluent pH
	(Gallons)	(GPM)	(PSI)	(PSI)	(PSI)	(mg/L)[1]	(SU)[1]
9/1/2022	8,018,693,000	3,050	85	75	9.2	1.76 read 1.81 manual	7.00 read
9/2/2022	8,024,135,000	3,150	82	73	9.4	1.81 read 1.94 manual	7.00 read
9/6/2022	8,037,753,000	2,000	68	62	5.2	1.83 read -- manual	6.90 read
9/7/2022	8,040,797,000	1,950	69	65	5.0	2.01 read 2.00 manual	7.00 read
9/8/2022	8,044,323,000	2,100	56	50	5.8	1.98 read 2.07 manual	6.90 read
9/9/2022	8,047,548,000	3,100	82	73	9.1	2.01 read 2.22 manual	6.90 read
9/12/2022	8,058,566,000	1,800	85	80	5.7	1.96 read 2.09 manual	7.00 read
9/13/2022	8,061,308,000	1,800	70	65	5.5	1.94 read 2.06 manual	6.90 read
9/14/2022	8,065,273,000	1,950	68	63	5.7	1.65 read 1.74 manual	6.90 read
9/15/2022	8,068,891,000	1,950	70	65	5.7	1.78 read 1.84 manual	6.95 read
9/16/2022	8,071,409,000	3,450	78	66	12.8	1.53 read 1.71 manual	7.00 read
9/19/2022	8,082,196,000	3,200	83	73	10.8	1.28 read 1.51 manual	6.95 read
9/20/2022	8,085,367,000	3,300	73	61	12.9	1.96 read 2.11 manual	6.95 read
9/21/2022	8,089,313,000	3,050	85	74	10.5	2.26 read 2.43 manual	6.95 read
9/22/2022	8,092,513,000	3,050	94	83	10.9	1.68 read 1.77 manual	7.05 read
9/23/2022	8,096,842,000	3,300	78	66	11.9	2.00 read 2.11 manual	7.00 read
9/26/2022	8,105,262,000	1,900	60	51	9.2	1.94 read 2.08 manual	7.10 read
9/27/2022	8,108,132,000	3,250	78	67	16.4	1.88 read 1.97 manual	7.10 read
9/28/2022	8,111,473,000	3,000	86	75	10.8	1.95 read 2.08 manual	6.90 read
9/29/2022	8,115,725,000	3,400	73	61	12.0	1.70 read 1.83 manual	7.00 read
9/30/2022	8,118,083,000	3,325	75	64	11.9	1.76 read 1.83 manual	6.90 read

(1) Effluent pH and chlorine residual readings are recorded by the in-line pH meter and chlorine analyzer. Chlorine is also checked with a manual chlorine residual meter for comparison, while manual pH is only checked occasionally. Both in-line and manual readings are presented, if collected, as noted above.

Figure 1, below, illustrates the volume of water treated by the GAC System since system startup, with the increment for the month of September 2022. Over 99.3 million gallons of water were treated in September 2022, bringing the total cumulative volume of water treated since startup to over 8.11 billion gallons.

Figure 1 - ***Volume of Water Treated through Full Scale GAC System (September 2022)***



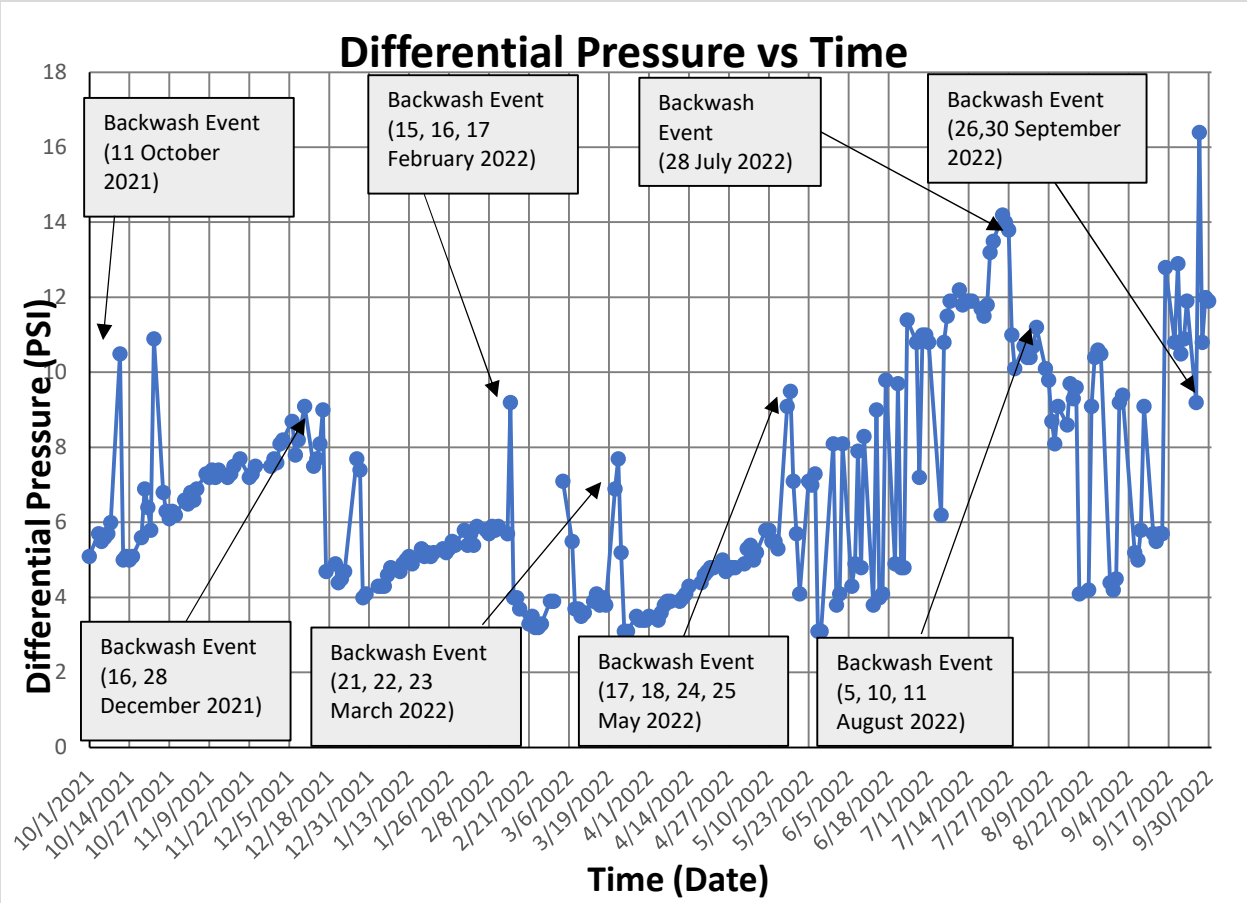
In general, differential pressure increases as the system continues to operate, and decreases after a backwashing event. The increasing trend then continues until the next backwashing event is performed. Also, lower differential pressures are observed during times of low water demand (e.g., typically over the winter months). **Figure 2,** below, depicts the pressure loss across the GAC System and subsequent backwashing dates, from October 2021 through the current reporting period.

Backwashing events during the summer and fall are performed more often because of the higher demand during that time of year. The exchange of carbon in each of the six GAC vessels with virgin coconut shell carbon was completed in August 2020 and the Seamans Neck Road facility

is able to operate at full capacity. In support of the 2020 Fourth Quarter microbiological (MIC) sampling conducted in December 2020, it was identified that each vessel required additional backwashing and/or flushing prior to returning to service to address a colored water issue attributable to the remobilization of iron-impacted materials released when flow through the vessels was stopped for a mandatory 12-hour period prior to bacteria sampling, per Nassau County Department of Health (NCDH) requirements. The additional backwashing/flushing events have been incorporated into the standard process for bacteria sampling.

The facility is operating at full design capacity and pressure loss across the overall GAC System is monitored regularly, and it is expected that backwashing events will occur on a periodic basis as needed. In addition, it is expected that backwashing of each vessel will be conducted following each quarterly bacteria sampling event to address potential colored water issues and to ensure the timely return to service for each vessel.

Figure 2 - *System Differential Pressure vs. Time*



System Maintenance

Routine maintenance of the GAC System during this reporting period consisted of:

- General monitoring of the system flow rates, totalized flows, influent and effluent pressures, differential pressure, chlorine residual, and pH readings.
- Changing paper for the chlorine/pH chart recorder and flow/differential pressure chart recorder on a weekly basis.
- Calibration of the pH meter on a weekly basis.
- Periodic running of Well 3A in place of or concurrently with Well 4S had previously been initiated; Well 3A ran concurrently with Well 4S on 1 through 2 September, 9 September, 16 through 23 September, and from 27 through 30 September.

In addition, the following non-routine activities or operation issues occurred during the September 2022 reporting period:

- On 26 September, GACs #100 and #200 were backwashed following the MIC sampling event.
- On 30 September, GACs #300 and #400 were backwashed following the MIC sampling event.

Please contact me at 610-400-0636 or rgregory@komangs.com with any questions or concerns regarding this report.

Sincerely,

KOMAN Government Solutions, LLC

Robert G. Gregory
Project Manager

Cc: C. Shukis - NAVFAC
V. Varricchio - NWIRP Bethpage Facilities Management
R. Kern - LNYW
N. Niola – LNYW
J. Palmer - LNYW
P. Schauble - KGS
R. Hoffmaster – KGS
D. Brayack - Tetra Tech
J. Pelton – NYSDEC
K. Granzen – NYSDEC
M. Travis – NYSDEC

ATTACHMENT 1

O&M LOGS – SEPTEMBER 2022

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	8.29.2022	8.30.2022	8.31.2022	9.1.2022	9.2.2022	9.6.2022
System Flow Rate	GPM	2050	2000	2000	3050	3150	2000
Total System Flow	Gallons	8091954	8095551	8098804	8102565	8108007	8216625
Well 3 Status	ON OR OFF	OFF	OFF	OFF	ON	ON	OFF
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	250	250	250	450	450	250
Tank 200 Flow Rate	GPM	250	250	250	450	500	250
Tank 300 Flow Rate	GPM	350	350	350	600	600	350
Tank 400 Flow Rate	GPM	400	350	350	550	600	400
Tank 500 Flow Rate	GPM	400	400	400	650	650	400
Tank 600 Flow Rate	GPM	300	300	300	500	500	250
Tank 100 Total Flow	Gallons	12,574,000	13,318,000	13571,000	13,928,000	14,409,000	15-850,000
Tank 200 Total Flow	Gallons	50,982,000	51,610,000	52,028,000	52,511,000	53,050,000	54,975,000
Tank 300 Total Flow	Gallons	45,981,000	46,725,000	47,288,000	48,100,000	48,921,000	51,548,000
Tank 400 Total Flow	Gallons	31,009,000	32,005,000	32,641,000	33,287,000	33,858,000	36,594,000
Tank 500 Total Flow	Gallons	65,111,000	66,325,000	67,065,000	67,764,000	68,483,000	21,609,000
Tank 600 Total Flow	Gallons	19,962,000	20,750,000	21,198,000	21,796,000	22,307,000	24,654,000
System Influent Pressure	PSI	57	79	59	85	82	68
System Effluent Pressure	PSI	54	75	55	75	73	62
System Differential Pressure	PSI	4.4	4.2	4.5	9.2	9.4	5.2
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.70	1.81	1.58	1.76	1.81	1.83
Effluent Water pH - Inline	Units	7.0	7.0	6.9	7.0	7.0	6.9
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.83	1.89	1.69	1.89	1.94	
Manual pH check (ex: Henna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	8-29-2022	8-30-2022	8-31-2022	9-1-2022	9-2-2022	9-6-2022
Tank 900A Hypochlorite Level	Gallons	150	138	121	151	124	150
Tank 900B Hypochlorite Level	Gallons	151	142	80	147	140	154
Tank 900C Hypochlorite Level	Gallons	153	106	100	150	150	153
Tank 900A Polyphosphate Level	Gallons	141	41	131	109	82	150
Tank 900B Polyphosphate Level	Gallons	141	141	141	141	148	152
Metering Pump 900A: Hypochlorite Output Pressure	PSI						
Metering Pump 900B: Hypochlorite Output Pressure	PSI						
Metering Pump 900A: Phosphate Output Pressure	PSI						
Metering Pump 900B: Phosphate Output Pressure	PSI						
Metering Pump 900A: Stroke/Speed	Units						
Metering Pump 900B: Stroke/Speed	Units						
Metering Pump 900A: Stroke/Speed	Units						
Metering Pump 900B: Stroke/Speed	Units						
Generator Operating Hours	Hours	182.5	182.5	182.5	182.5	182.9	183.2
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Cl Delv.		Phos. Delv	Cl Delv. changed flow / PH charts		Cl Delv Phos. Delv Gen. In Alarm

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	9-7-2022	9-8-2022	9-9-2022	9-12-2022	9-13-2022	9-14-2022
System Flow Rate	GPM	1950	2100	3100	1800	1800	1950
Total System Flow	Gallons	8124669	8128195	8131420	8142438	8145180	8149145
Well 3 Status	ON OR OFF	OFF	OFF	ON	OFF	OFF	OFF
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	250	250	400	250	250	250
Tank 200 Flow Rate	GPM	250	250	400	250	250	250
Tank 300 Flow Rate	GPM	350	350	600	350	350	350
Tank 400 Flow Rate	GPM	400	400	550	325	300	300
Tank 500 Flow Rate	GPM	450	450	650	350	350	350
Tank 600 Flow Rate	GPM	250	300	450	250	250	300
Tank 100 Total Flow	Gallons	16,297,000	16,670,000	17,080,000	18,487,000	18,826,000	19,324,000
Tank 200 Total Flow	Gallons	55,368,000	55,820,000	56,237,000	57,663,000	58,018,000	58,658,000
Tank 300 Total Flow	Gallons	52,160,000	52,811,000	53,411,000	55,460,000	55,967,000	56,698,000
Tank 400 Total Flow	Gallons	37,133,000	37,752,000	38,319,000	40,249,000	40,735,000	41,428,000
Tank 500 Total Flow	Gallons	72,201,000	72,894,000	73532,000	75,711,000	76,246,000	77,028,000
Tank 600 Total Flow	Gallons	25,105,000	25,628,000	26,115,000	27,749,000	28,145,000	28,748,000
System Influent Pressure	PSI	69	56	82	85	70	68
System Effluent Pressure	PSI	65	50	73	80	65	63
System Differential Pressure	PSI	5.0	5.8	9.1	5.7	5.5	5.7
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	2.01	1.98	2.01	1.96	1.94	1.65
Effluent Water pH - Inline	Units	7.0	6.9	6.9	7.0	6.9	6.9
Manual Chlorine Reading (ex: Hach Kit)	PPM	2.00	2.07	2.22	2.09	2.06	1.74
Manual pH check (ex: Henna)	Units	—					

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	9.7.2022	9.8.2022	9.9.2022	9.12.2012	9.13.2022	9.14.2022
Tank 600A Hypochlorite Level	Gallons	107	151	129	143	117	134
Tank 600B Hypochlorite Level	Gallons	141	143	135	145	140	140
Tank 600C Hypochlorite Level	Gallons	145	145	145	147	145	45
Tank 600A Polyphosphate Level	Gallons	133	113	81	40	30	160
Tank 600B Polyphosphate Level	Gallons	150	150	145	142	127	148
Metering Pump 600A: Hypochlorite Output Pressure	PSI						
Metering Pump 600B: Hypochlorite Output Pressure	PSI						
Metering Pump 600A: Phosphate Output Pressure	PSI						
Metering Pump 600B: Phosphate Output Pressure	PSI						
Metering Pump 600A: Stroke/Speed	Units						
Metering Pump 600B: Stroke/Speed	Units						
Metering Pump 600A: Stroke/Speed	Units						
Metering Pump 600B: Stroke/Speed	Units						
Generator Operating Hours	Hours	183.2	183.2	183.5	183.5	183.5	183.5
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)				Monthly Sampling 1,4 Dioxane POC's	CL Delta		Phos. Delta

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	9-15-2022	9-16-2022	9-19-2022	9-20-2022	9-21-2022	9-22-2022
System Flow Rate	GPM	1950	3450	3200	3300	3050	3050
Total System Flow	Gallons	8152763	8155281	8166068	8169239	8173185	8176385
Well 3 Status	ON OR OFF	OFF	ON	ON	ON	ON	ON
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	250	450	450	450	450	450
Tank 200 Flow Rate	GPM	250	500	450	500	450	450
Tank 300 Flow Rate	GPM	300	700	600	650	550	550
Tank 400 Flow Rate	GPM	350	650	650	650	550	550
Tank 500 Flow Rate	GPM	350	700	650	650	600	550
Tank 600 Flow Rate	GPM	250	600	500	500	450	500
Tank 100 Total Flow	Gallons	19,795,000	20,171,000	21,506,000	21,908,000	22,419,000	22,795,000
Tank 200 Total Flow	Gallons	59,004,000	59,834,000	60,727,000	61,137,000	61,645,000	62,061,000
Tank 300 Total Flow	Gallons	57,372,000	57,834,000	59,836,000	60,422,000	61,151,000	61,715,000
Tank 400 Total Flow	Gallons	42,059,000	43,495,000	44,384,000	44,940,000	45,628,000	46,170,000
Tank 500 Total Flow	Gallons	77,750,000	78,242,000	80,348,000	81,010,000	81,797,000	82,378,000
Tank 600 Total Flow	Gallons	29,283,000	29,654,000	31,261,000	31,742,000	32,319,000	32,765,000
System Influent Pressure	PSI	70	78	83	73	85	94
System Effluent Pressure	PSI	65	66	73	61	74	83
System Differential Pressure	PSI	5.7	12.8	10.8	12.9	10.5	10.9
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.78	1.53	1.28	1.96	2.26	1.68
Effluent Water pH - Inline	Units	6.95	7.0	6.95	6.95	6.95	7.05
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.84	1.71	1.51	2.11	2.43	1.77
Manual pH check (ex: Hanna)	Units	~					

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	9-15-2022	9-16-2022	9-19-2022	9-20-2022	9-21-2022	9-22-2022
Tank 900A Hypochlorite Level	Gallons	140	130	75	145	121	109
Tank 900B Hypochlorite Level	Gallons	143	121	90	146	110	100
Tank 900C Hypochlorite Level	Gallons	145	145	20	145	145	75
Tank 900A Polyphosphate Level	Gallons	143	130	78	60	158	131
Tank 900B Polyphosphate Level	Gallons	119	115	106	101	160	150
Metering Pump 900A: Hypochlorite Output Pressure	PSI						
Metering Pump 900B: Hypochlorite Output Pressure	PSI						
Metering Pump 900A: Phosphate Output Pressure	PSI						
Metering Pump 900B: Phosphate Output Pressure	PSI						
Metering Pump 900A: Stroke/Speed	Units						
Metering Pump 900B: Stroke/Speed	Units						
Metering Pump 900A: Stroke/Speed	Units						
Metering Pump 900B: Stroke/Speed	Units						
Generator Operating Hours	Hours	183.9	183.9	183.9	183.9	1839	183.9
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Phos. Delv. Cl Delv. changed flow / PH Charts			Cl Delv.	Phos. Delv.	Changed flow / PH Charts

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	9.23.22	9.26.22	9.27.22	9.28.22	9.29.2022	9.30.22
System Flow Rate	GPM	3300	1900	3250	3000	3400	3325
Total System Flow	Gallons	8180714	8189134	8192004	8195345	8199597	8201955
Well 3 Status	ON OR OFF	ON	OFF	ON	ON	ON	ON
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	500	o/c	500	500	550	450
Tank 200 Flow Rate	GPM	450	o/c	500	500	600	450
Tank 300 Flow Rate	GPM	600	500	600	500	650	650
Tank 400 Flow Rate	GPM	650	500	600	500	650	650
Tank 500 Flow Rate	GPM	650	550	650	550	700	650
Tank 600 Flow Rate	GPM	500	450	500	450	550	450
Tank 100 Total Flow	Gallons	23,161,000	24,022,000	24,281,000	24,855,000	25,496,000	25,966,000
Tank 200 Total Flow	Gallons	62,962,000	63,308,000	63,559,000	64,082,000	64,484,000	65,109,000
Tank 300 Total Flow	Gallons	62,231,000	64,308,000	64,898,000	65,480,000	66,025,000	66,585,000
Tank 400 Total Flow	Gallons	46,696,000	48,625,000	49,181,000	49,713,000	50,364,000	50,807,000
Tank 500 Total Flow	Gallons	82,957,000	85,121,000	85,750,000	86,363,000	86,937,000	87,529,000
Tank 600 Total Flow	Gallons	33,202,000	34,819,000	35,288,000	35,758,000	36,185,000	36,633,000
System Influent Pressure	PSI	78	60	78	86	73	75
System Effluent Pressure	PSI	66	51	67	75	61	64
System Differential Pressure	PSI	11.9	9.2	11.4	10.8	12.0	11.9
Chlorine Analyzer: Free Chlorine Residual - inline	PPM	2.00	1.94	1.88	1.95	1.70	1.76
Effluent Water pH - Inline	Units	7.0	7.1	7.1	6.9	7.0	6.9
Manual Chlorine Reading (ex: Hach Kit)	PPM	2.11	2.08	1.97	2.08	1.83	1.83
Manual pH check (ex: Henna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	9.23.2022	9.26.22	9.27.2022	9.28.22	9.29.2022	9.30.22
Tank 900A Hypochlorite Level	Gallons	145	112	145	127	94	151
Tank 900B Hypochlorite Level	Gallons	143	80	146	131	117	147
Tank 900C Hypochlorite Level	Gallons	146	80	150	150	100	145
Tank 900A Polyphosphate Level	Gallons	114	61	47	31	121	101
Tank 900B Polyphosphate Level	Gallons	150	141	138	135	140	137
Metering Pump 900A: Hypochlorite Output Pressure	PSI						
Metering Pump 900B: Hypochlorite Output Pressure	PSI						
Metering Pump 900A: Phosphate Output Pressure	PSI						
Metering Pump 900B: Phosphate Output Pressure	PSI						
Metering Pump 900A: Stroke/Speed	Units						
Metering Pump 900B: Stroke/Speed	Units						
Metering Pump 900A: Stroke/Speed	Units						
Metering Pump 900B: Stroke/Speed	Units						
Generator Operating Hours	Hours	183.9	183.9	183.9	183.9	183.9	184.3
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		CL Delv.	Sampled GAC's 1&2 well 3 Put LGAC back in System. 10:30			Phos. Delv Changed flow / PH chart	CL Delv. Sampled GAC's 3&4 and EFF Fe