6 May 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: **April 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 Treatment Plant in Levittown, NY. The GAC System was installed at the effluent of the potable water treatment 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 April 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 April 2022 is presented below in **Table 1**.

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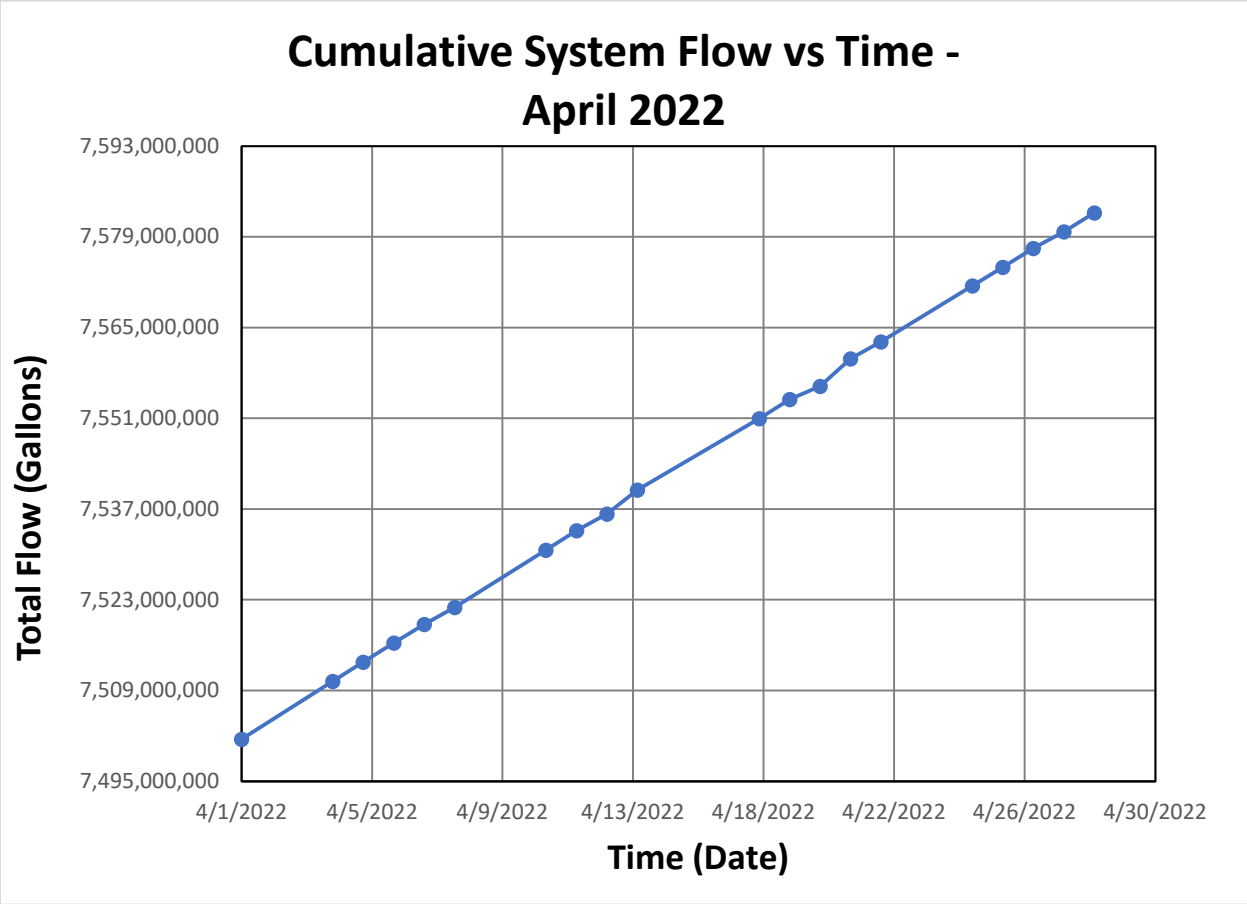
Table 1 - ***System Operating Data for April 2022***

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]
4/1/2022	7,501,473,000	2,100	68	65	3.5	1.49 read 1.48 manual	6.80 read
4/4/2022	7,510,423,000	2,050	64	64	3.4	1.43 read 1.41 manual	6.80 read
4/5/2022	7,513,377,000	2,050	69	66	3.6	1.46 read 1.45 manual	6.80 read
4/6/2022	7,516,350,000	2,150	63	59	3.8	1.37 read 1.36 manual	6.90 read
4/7/2022	7,519,206,000	2,100	64	61	3.9	1.44 read 1.43 manual	6.80 read
4/8/2022	7,521,817,000	2,000	63	60	3.9	1.54 read 1.53 manual	7.00 read
4/11/2022	7,530,683,000	2,050	70	66	3.9	1.44 read 1.42 manual	6.90 read
4/12/2022	7,533,683,000	2,050	70	66	4.0	1.59 read 1.56 manual	6.90 read
4/13/2022	7,536,267,000	2,100	64	60	4.1	1.57 read 1.55 manual	6.70 read
4/14/2022	7,539,975,000	2,150	67	63	4.3	1.58 read 1.57 manual	6.60 read
4/18/2022	7,550,943,000	2,150	69	65	4.4	1.59 read 1.57 manual	6.50 read
4/19/2022	7,553,915,000	2,200	67	62	4.6	1.57 read 1.55 manual	6.60 read
4/20/2022	7,555,972,000	2,150	68	63	4.7	1.59 read 1.58 manual	6.80 read
4/21/2022	7,560,174,000	2,200	69	65	4.8	1.63 read 1.64 manual	6.50 read
4/22/2022	7,562,824,000	2,200	56	51	4.8	1.53 read 1.51 manual	6.60 read
4/25/2022	7,571,442,000	2,250	56	51	5.0	1.41 read 1.40 manual	6.50 read
4/26/2022	7,574,334,000	2,025	76	72	4.7	1.62 read 1.60 manual	6.30 read
4/27/2022	7,577,227,000	2,000	75	70	4.8	1.73 read 1.71 manual	6.40 read
4/28/2022	7,579,802,000	2,000	73	68	4.8	1.60 read 1.60 manual	6.50 read
4/29/2022	7,582,710,000	1,900	82	77	4.8	1.90 read 1.88 manual	6.45 manual

(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 April 2022. Over 84.0 million gallons of water were treated in April 2022, bringing the total cumulative volume of water treated since startup to over 7.58 billion gallons.

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



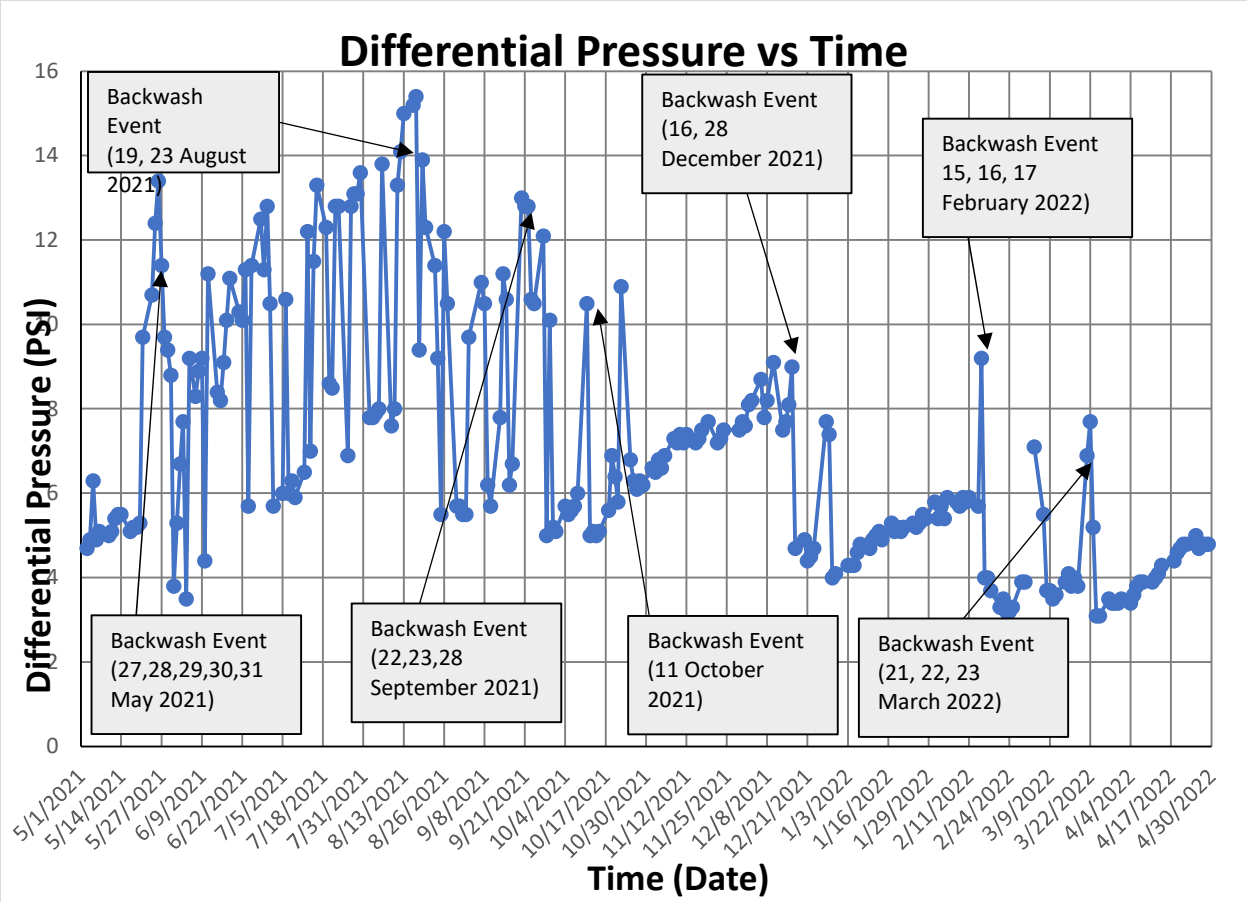
In general, differential pressure increases as the system continues to operate, and decreases after a backwashing event. The increasing trend then continues until the next backwashing event is performed. Also, lower differential pressures are observed during times of low water demand (e.g., typically over the winter months). **Figure 2,** below, depicts the pressure loss across the GAC System and subsequent backwashing dates, from May 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 bacteria 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 NCDOH 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 - S*ystem 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 by NYAW; Well 3A did not operate in April 2022.

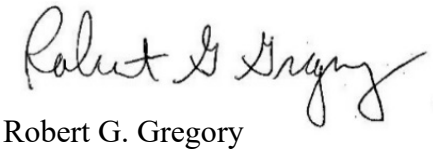
In addition, the following non-routine activities or operation issues occurred during the April 2022 reporting period:

- 29 April – Replaced interior light bulbs within the plant.

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 – APRIL 2022

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	3.25.2022	3.28.2022	3.29.2022	3.30.2022	3.31.2022	4.1.2022
System Flow Rate	GPM	2100	2150	2000	2200	2050	2100
Total System Flow	Gallons	7565008	7573925	7576772	7579022	7582595	7585345
Well 3 Status	ON OR OFF	OFF	OFF	OFF	OFF	OFF	OFF
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	250	225	250	250	250	250
Tank 200 Flow Rate	GPM	250	225	225	300	225	225
Tank 300 Flow Rate	GPM	350	350	350	350	350	350
Tank 400 Flow Rate	GPM	350	350	350	350	350	350
Tank 500 Flow Rate	GPM	350	400	350	400	350	350
Tank 600 Flow Rate	GPM	300	350	250	300	250	250
Tank 100 Total Flow	Gallons	36,088,000	37,328,000	37,711,000	38,135,000	38,514,000	38,804,000
Tank 200 Total Flow	Gallons	77,964,000	79,169,000	79,551,000	79,963,000	80,377,000	80,610,000
Tank 300 Total Flow	Gallons	54,658,000	56,224,000	56,719,000	57,231,000	57,737,000	58,210,000
Tank 400 Total Flow	Gallons	45,646,000	47,163,000	47,642,000	48,135,000	48,622,000	49,004,000
Tank 500 Total Flow	Gallons	65,751,000	67,406,000	67,928,000	68,491,000	68,998,000	69,414,000
Tank 600 Total Flow	Gallons	41,104,000	42,384,000	42,788,000	43,226,000	43,621,000	43,906,000
System Influent Pressure	PSI	60	55	69	55	69	68
System Effluent Pressure	PSI	57	51	65	52	66	65
System Differential Pressure	PSI	3.1	3.5	3.4	3.4	3.4	3.5
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.67	1.64	1.67	1.41	1.45	1.49
Effluent Water pH - Inline	Units	6.80	6.75	6.60	6.80	6.80	6.80
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.65	1.64	1.66	1.41	1.44	1.48
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	3.25.2022	3.28.2022	3.29.2022	3.30.2022	3.31.2022	4.1.2022
Tank 900A Hypochlorite Level	Gallons	105	139	98	62	140	121
Tank 900B Hypochlorite Level	Gallons	145	80	80	80	145	140
Tank 900C Hypochlorite Level	Gallons	147	50	50	50	150	150
Tank 900A Polyphosphate Level	Gallons	60	130	99	78	61	43
Tank 900B Polyphosphate Level	Gallons	51	160	160	160	160	160
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	173.4	173.4	173.4	173.4	173.4	173.4
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)			Phos. Dely.				

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	4.4.2022	4.5.2022	4.6.2022	4.7.2022	4.8.2022	4.11.2022
System Flow Rate	GPM	2050	2050	2150	2100	2000	2050
Total System Flow	Gallons	7594295	7597249	7600222	7603078	7605689	7614555
Well 3 Status	ON OR OFF	OFF	OFF	OFF	OFF	OFF	OFF
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	250	250	300	250	300	250
Tank 200 Flow Rate	GPM	250	250	300	300	250	250
Tank 300 Flow Rate	GPM	350	350	350	350	350	350
Tank 400 Flow Rate	GPM	350	350	350	350	350	350
Tank 500 Flow Rate	GPM	350	350	350	350	350	350
Tank 600 Flow Rate	GPM	250	300	250	250	250	250
Tank 100 Total Flow	Gallons	40,187,000	40,534,000	40,931,000	41,271,000	41,675,000	42,904,000
Tank 200 Total Flow	Gallons	81,922,000	82,322,000	82,721,000	83,007,000	83,460,000	84,660,000
Tank 300 Total Flow	Gallons	59,754,000	60,213,000	60,830,000	61,409,000	61,780,000	63,357,000
Tank 400 Total Flow	Gallons	50,588,000	51,075,000	51,571,000	52,111,000	52,490,000	53,967,000
Tank 500 Total Flow	Gallons	71,158,000	71,698,000	72,249,000	72,781,000	73,244,000	74,879,000
Tank 600 Total Flow	Gallons	45,296,000	45,718,000	46,140,000	46,558,000	46,870,000	48,189,000
System Influent Pressure	PSI	64	69	63	64	63	70
System Effluent Pressure	PSI	64	66	59	61	60	66
System Differential Pressure	PSI	3.4	3.6	3.8	3.9	3.9	3.9
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.43	1.46	1.37	1.44	1.54	1.414
Effluent Water pH - Inline	Units	6.8	6.8	6.9	6.8	7.0	6.9
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.41	1.45	1.36	1.43	1.53	1.42
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	4.4.2022	4.5.2022	4.6.2022	4.7.2022	4.8.2022	4.11.2022
Tank 909A Hypochlorite Level	Gallons	20	15	15	145	135	20
Tank 909B Hypochlorite Level	Gallons	146	105	73	145	105	120
Tank 909C Hypochlorite Level	Gallons	150	150	143	143	145	140
Tank 909A Polyphosphate Level	Gallons	76	52	145	122	109	57
Tank 909B Polyphosphate Level	Gallons	160	160	160	160	160	160
Metering Pump 909A: Hypochlorite Output Pressure	PSI						
Metering Pump 909B: Hypochlorite Output Pressure	PSI						
Metering Pump 909A: Phosphate Output Pressure	PSI						
Metering Pump 909B: Phosphate Output Pressure	PSI						
Metering Pump 909A: Stroke/Speed	Units						
Metering Pump 909B: Stroke/Speed	Units						
Metering Pump 909A: Stroke/Speed	Units						
Metering Pump 909B: Stroke/Speed	Units						
Generator Operating Hours	Hours	173.8	173.8	173.8	173.8	174.2	174.2
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)				Phos. Delv.		Monthly 1,4 / POC Sampling	

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	4·12·2022	4·13·2022	4.14.2022	4·18·2022	4.19.2022	4.20.2022
System Flow Rate	GPM	2050	2100	2150	2150	2200	2150
Total System Flow	Gallons	7617555	7620139	7623847	7634815	7637787	7639844
Well 3 Status	ON OR OFF	OFF	OFF	OFF	OFF	OFF	OFF
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	250	250	250	250	250	250
Tank 200 Flow Rate	GPM	250	250	300	300	300	300
Tank 300 Flow Rate	GPM	350	350	350	350	350	350
Tank 400 Flow Rate	GPM	350	350	350	350	350	350
Tank 500 Flow Rate	GPM	350	350	350	350	350	350
Tank 600 Flow Rate	GPM	250	300	300	250	300	300
Tank 100 Total Flow	Gallons	43,321,000	43,691,000	44,171,000	54,748,000	55,071,000	55,311,000
Tank 200 Total Flow	Gallons	85,065,000	85,418,000	85,911,000	87,408,000	87,793,000	88,082,000
Tank 300 Total Flow	Gallons	63,885,000	64,354,000	64,721,000	66,939,000	67,428,000	67,809,000
Tank 400 Total Flow	Gallons	54,468,000	54,898,000	55,287,000	57,327,000	57,510,000	57,889,000
Tank 500 Total Flow	Gallons	75,430,000	75,910,000	76,410,000	78,618,000	79,148,000	79,501,000
Tank 600 Total Flow	Gallons	48,618,000	48,997,000	49,297,000	51,090,000	51,311,000	51,601,000
System Influent Pressure	PSI	70	64	67	69	67	68
System Effluent Pressure	PSI	66	60	63	65	62	63
System Differential Pressure	PSI	4.0	4.1	4.3	4.4	4.6	4.7
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.59	1.57	1.58	1.59	1.57	1.59
Effluent Water pH - Inline	Units	6.90	6.7	6.6	6.5	6.6	6.8
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.56	1.55	1.57	1.57	1.55	1.58
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	4.12.2022	4.13.2022	4.14.2022	4.18.2022	4.19.2022	4.20.2022
Tank 909A Hypochlorite Level	Gallons	120	92	145	71	53	31
Tank 909B Hypochlorite Level	Gallons	120	120	145	95	90	82
Tank 909C Hypochlorite Level	Gallons	10	10	145	145	145	140
Tank 908A Polyphosphate Level	Gallons	148	131	114	82	61	150
Tank 908B Polyphosphate Level	Gallons	160	160	160	142	142	142
Metering Pump 909A: Hypochlorite Output Pressure	PSI						
Metering Pump 909B: Hypochlorite Output Pressure	PSI						
Metering Pump 908A: Phosphate Output Pressure	PSI						
Metering Pump 908B: Phosphate Output Pressure	PSI						
Metering Pump 909A: Stroke/Speed	Units						
Metering Pump 909B: Stroke/Speed	Units						
Metering Pump 908A: Stroke/Speed	Units						
Metering Pump 908B: Stroke/Speed	Units						
Generator Operating Hours	Hours	174.2	174.2	174.5	174.5	174.5	174.5
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Phos. Delv.		CL Delv.			Phos. Delv.

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	4.21.2022	4.22.2022	4.25.2025	4-26 2022	4.27.2022	4.28 2022
System Flow Rate	GPM	2200	2200	2250	2025	2000	2000
Total System Flow	Gallons	7644046	7646696	7655314	7658206	7661099	7663674
Well 3 Status	ON OR OFF	OFF	OFF	OFF	OFF	OFF	
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	
Tank 100 Flow Rate	GPM	300	300	300	300	300	250
Tank 200 Flow Rate	GPM	300	300	300	300	250	250
Tank 300 Flow Rate	GPM	350	350	350	350	350	350
Tank 400 Flow Rate	GPM	350	350	350	350	350	350
Tank 500 Flow Rate	GPM	350	300	300	350	350	350
Tank 600 Flow Rate	GPM	300	300	300	250	250	250
Tank 100 Total Flow	Gallons	47,036,000	47,390,000	48,589,000	49,004,000	49,408,000	49,767,000
Tank 200 Total Flow	Gallons	88,561,000	89,004,000	90,180,000	90,584,000	90,891,000	91,333,000
Tank 300 Total Flow	Gallons	68,461,000	69,009,000	70,584,000	71,046,000	71,555,000	72,000,000
Tank 400 Total Flow	Gallons	58,621,000	59,276,000	60,690,000	61,181,000	61,668,000	62,098,000
Tank 500 Total Flow	Gallons	80,319,000	80,789,000	82,389,000	82,931,000	83,468,000	83,944,000
Tank 600 Total Flow	Gallons	51,908,000	52,274,000	54,011,000	54,436,000	54,852,000	55,221,000
System Influent Pressure	PSI	69	56	56	76	75	73
System Effluent Pressure	PSI	65	51	51	72	70	68
System Differential Pressure	PSI	4.8	4.8	5.0	4.7	4.8	4.8
Chlorine Analyzer: Free Chlorine Residual - inline	PPM	1.63	1.53	1.41	1.62	1.73	1.60
Effluent Water pH - inline	Units	6.5	6.6	6.50	6.30	6.4	6.5
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.64	1.51	1.40	1.60	1.71	1.60
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	4.21.2022	4.22.2022	4.25.2022	4.26.2022	4.27.2022	4.28.2022
Tank 900A Hypochlorite Level	Gallons	145	138	140	100	61	143
Tank 900B Hypochlorite Level	Gallons	145	136	140	140	140	143
Tank 900C Hypochlorite Level	Gallons	145	145	30	30	30	145
Tank 900A Polyphosphate Level	Gallons	123	111	140	123	105	90
Tank 900B Polyphosphate Level	Gallons	142	142	142	142	142	142
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	174.2	174.6	174.6	174.6	174.6	174.6
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Cl Delv.	Changed flow/PH charts	Phos Delv			

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	4.29.2022					
System Flow Rate	GPM	1900					
Total System Flow	Gallons	7666582					
Well 3 Status	ON OR OFF	OFF					
Well 4 Status	ON OR OFF	ON					
Tank 100 Flow Rate	GPM	250					
Tank 200 Flow Rate	GPM	250					
Tank 300 Flow Rate	GPM	350					
Tank 400 Flow Rate	GPM	350					
Tank 500 Flow Rate	GPM	350					
Tank 600 Flow Rate	GPM	250					
Tank 100 Total Flow	Gallons	50,164,000					
Tank 200 Total Flow	Gallons	91,725,000					
Tank 300 Total Flow	Gallons	72,510,000					
Tank 400 Total Flow	Gallons	62,568,000					
Tank 500 Total Flow	Gallons	84,478,000					
Tank 600 Total Flow	Gallons	55,675,00					
System Influent Pressure	PSI	82					
System Effluent Pressure	PSI	77					
System Differential Pressure	PSI	4.8					
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.90					
Effluent Water pH - Inline	Units						
Manual Chlorine Reading (ex: Hach Kit)	PPM	6.45					
Manual pH check (ex: Hanna)	Units	1.88					

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	4/29/2022					
Tank 900A Hypochlorite Level	Gallons	121					
Tank 900B Hypochlorite Level	Gallons	143					
Tank 900C Hypochlorite Level	Gallons	145					
Tank 900A Polyphosphate Level	Gallons	72					
Tank 900B Polyphosphate Level	Gallons	142					
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	174.9					
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		changed flow / PH charts changed light bulbs					