17 August 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: **July 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 July 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 July 2022 is presented below in **Table 1**.

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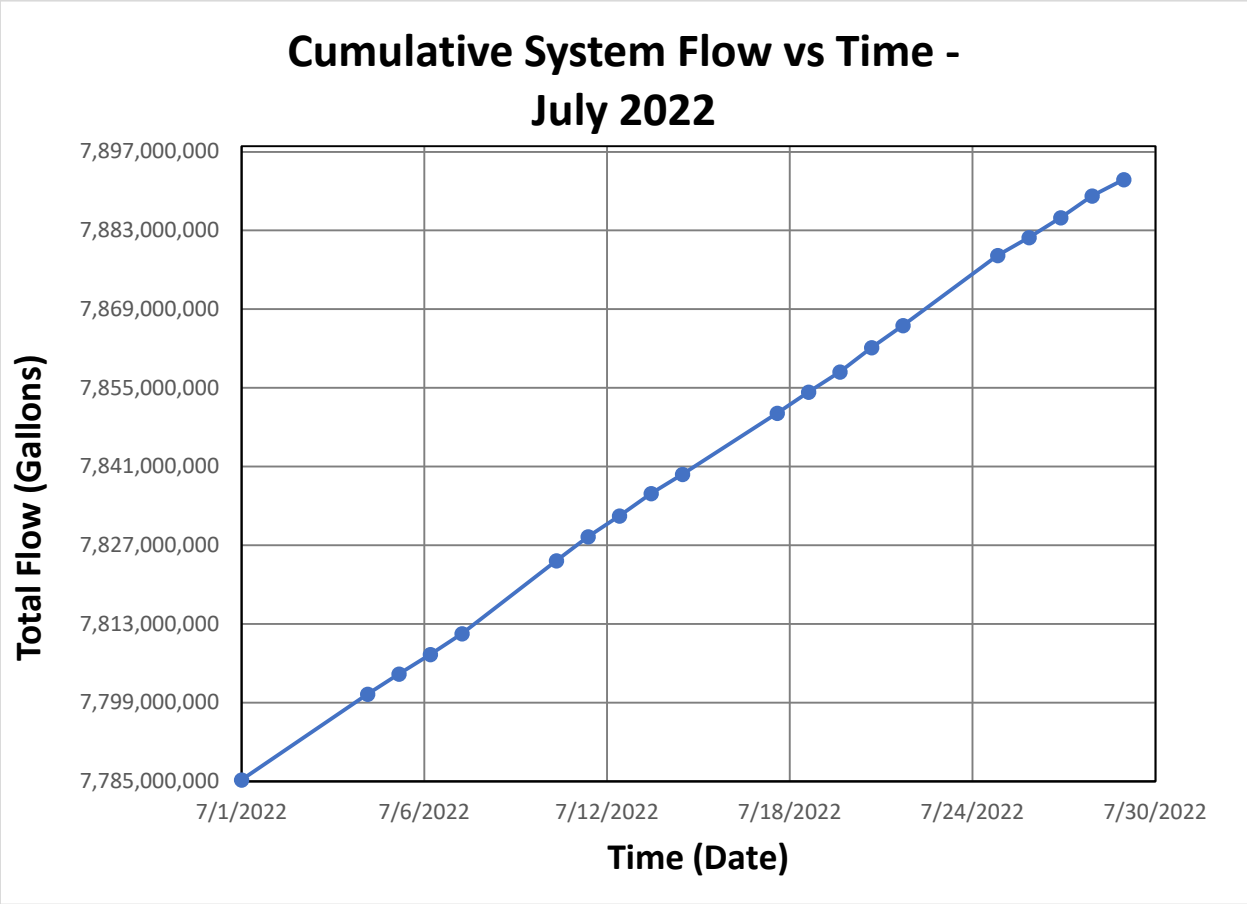
Table 1 - ***System Operating Data for July 2022***

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]
7/1/2022	7,785,272,000	3,250	78	57	10.8	1.88 read 1.86 manual	6.70 read
7/5/2022	7,800,499,000	2,250	58	50	6.2	1.75 read 1.75 manual	6.80 read
7/6/2022	7,804,115,000	3,250	80	69	10.8	1.51 read 1.49 manual	6.80 read
7/7/2022	7,807,579,000	3,375	75	63	11.5	1.62 read 1.59 manual	6.80 read
7/8/2022	7,811,276,000	3,475	75	59	11.9	1.68 read 1.66 manual	6.70 read
7/11/2022	7,824,231,000	3,450	74	62	12.2	1.89 read 1.88 manual	6.80 read
7/12/2022	7,828,512,000	3,300	76	65	11.8	1.65 read 1.65 manual	6.80 read
7/13/2022	7,832,204,000	3,400	75	63	11.9	1.96 read 1.93 manual	6.80 read
7/14/2022	7,836,182,000	3,250	78	66	11.9	1.84 read 1.82 manual	6.90 read
7/15/2022	7,839,649,000	3,200	77	65	11.9	1.88 read 1.87 manual	6.90 read
7/18/2022	7,850,513,000	3,250	80	69	11.7	1.92 read 1.90 manual	7.00 read
7/19/2022	7,854,248,000	2,150	82	71	11.5	1.97 read 1.95 manual	6.90 read
7/20/2022	7,857,842,000	3,250	90	79	11.8	1.87 read 1.85 manual	7.00 read
7/21/2022	7,862,194,000	3,550	80	66	13.2	1.91 read 1.90 manual	7.00 read
7/22/2022	7,866,072,000	3,500	79	56	13.5	1.83 read 1.81 manual	6.90 read
7/25/2022	7,878,548,000	3,500	77	56	14.2	1.81 read 1.80 manual	6.90 read
7/26/2022	7,881,724,000	3,250	81	67	14.0	1.94 read 1.92 manual	6.90 read
7/27/2022	7,885,291,000	3,250	76	64	13.8	1.80 read 1.71 manual	6.90 read
7/28/2022	7,889,140,000	1,900	75	64	11.0	1.80 read 1.71 manual	6.90 read
7/29/2022	7,892,067,000	3,550	67	57	10.1	1.75 read 1.69 manual	7.00 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 July 2022. Over 114 million gallons of water were treated in July 2022, bringing the total cumulative volume of water treated since startup to over 7.89 billion gallons.

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



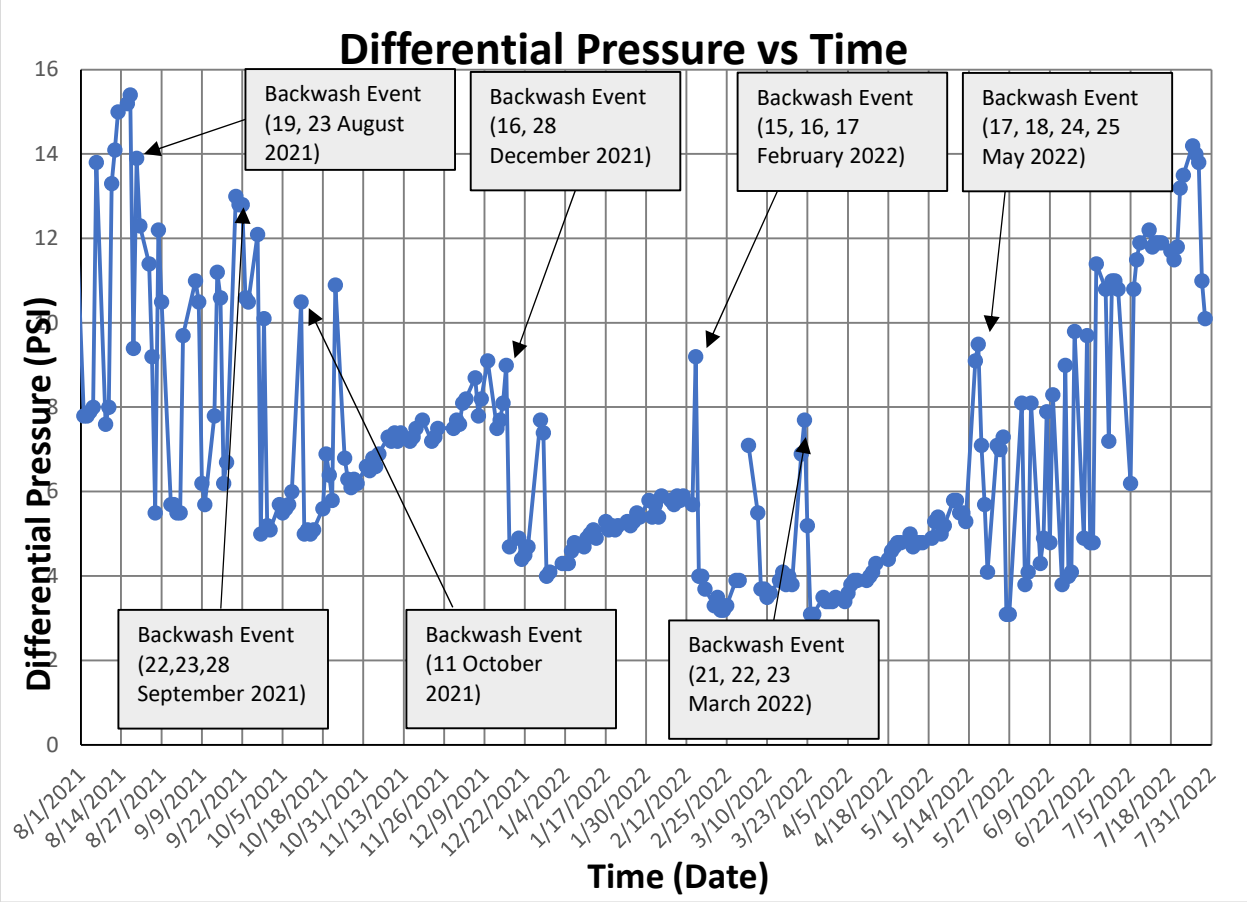
In general, differential pressure increases as the system continues to operate, and decreases after a backwashing event. The increasing trend then continues until the next backwashing event is performed. Also, lower differential pressures are observed during times of low water demand (e.g., typically over the winter months). **Figure 2,** below, depicts the pressure loss across the GAC System and subsequent backwashing dates, from August 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; Well 3A ran concurrently with Well 4S on 1 July, 6 July through 27 July, and on 29 July 2022.

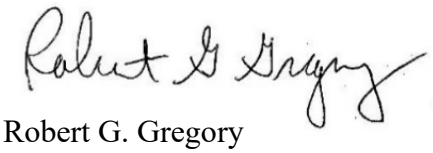
In addition, the following non-routine activities or operation issues occurred during the July 2022 reporting period:

- On 26 July, the operator replaced the outside lights and smoke sensors on the south end of the building.
- On 28 July, GACs #100 and #200 were backwashed as the result of higher than typical build-up of particulate material in the carbon matrix.

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
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J. Palmer - LNYW
P. Schauble - KGS
R. Hoffmaster – KGS
D. Brayack - Tetra Tech
J. Pelton – NYSDEC
K. Granzen – NYSDEC
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ATTACHMENT 1

O&M LOGS – JULY 2022

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	6.29.2022	6.30.2022	7.1.2022	7.5.2022	7.6.20	7.7.2022
System Flow Rate	GPM	3250	3350	3250	2250	3250	3375
Total System Flow	Gallons	78630317	78662841	7869144	7884377	7887987	7891451
Well 3 Status	ON OR OFF	ON	ON	ON	OFF	ON	ON
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	500	500	500	300	400	500
Tank 200 Flow Rate	GPM	550	500	500	250	400	500
Tank 300 Flow Rate	GPM	650	650	650	350	500	600
Tank 400 Flow Rate	GPM	600	650	600	400	550	550
Tank 500 Flow Rate	GPM	650	650	650	350	600	600
Tank 600 Flow Rate	GPM	550	600	550	300	500	500
Tank 100 Total Flow	Gallons	78,444,000	78,963,000	79,520,000	81,757,000	82,280,000	82,787,000
Tank 200 Total Flow	Gallons	19,124,000	19,592,000	20,180,000	22,236,000	22,934,000	23,210,000
Tank 300 Total Flow	Gallons	05,919,000	06,591,000	07,191,000	10,017,000	10,661,000	11,267,000
Tank 400 Total Flow	Gallons	93,928,000	94,523,000	95,168,000	97,697,000	98,290,000	98,864,000
Tank 500 Total Flow	Gallons	20,941,000	21,669,000	22,396,000	25,264,000	25,942,000	26,590,000
Tank 600 Total Flow	Gallons	85,711,000	86,038,000	86,633,000	88,955,000	89,501,000	90,025,000
System Influent Pressure	PSI	88	78	78	58	80	75
System Effluent Pressure	PSI	76	67	67	50	69	63
System Differential Pressure	PSI	12.0	11.0	10.8	6.2	10.8	11.5
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.68	1.84	1.88	1.75	1.51	1.62
Effluent Water pH - Inline	Units	6.9	6.9	6.7	6.8	6.8	6.8
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.66	1.82	1.80	1.75	1.49	1.59
Manual pH check (ex: Henna)	Units	—	—				

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	6-29-2022	6-30-2022	7-1-2022	7-5-2022	7-6-2022	7-7-2022
Tank 900A Hypochlorite Level	Gallons	98	120	191	151	141	84
Tank 900B Hypochlorite Level	Gallons	123	102	142	143	111	67
Tank 900C Hypochlorite Level	Gallons	142	45	143	142	142	142
Tank 900A Polyphosphate Level	Gallons	42	141	121	53	131	115
Tank 900B Polyphosphate Level	Gallons	125	156	149	140	125	125
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	181.2	181.2	181.2	181.2	181.2	181.2
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)			Phos. Delv.	CL2 Delv	CL2 Delv	Phos. Delv.	

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	7.8.2022	7.11.2022	7.12.2022	7.13.2022	7.14.2022	7.15.2022
System Flow Rate	GPM	3475	3450	3300	3400	3250	3200
Total System Flow	Gallons	7895148	7908103	7912381	7916076	7920054	7923521
Well 3 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	500	500	500	550	550	500
Tank 200 Flow Rate	GPM	500	500	500	600	550	550
Tank 300 Flow Rate	GPM	600	600	600	600	600	600
Tank 400 Flow Rate	GPM	600	600	600	600	600	600
Tank 500 Flow Rate	GPM	700	700	600	600	600	600
Tank 600 Flow Rate	GPM	500	550	500	550	550	500
Tank 100 Total Flow	Gallons	85,325,000	85,278,000	85,923,000	86,434,000	87,045,000	87,540,000
Tank 200 Total Flow	Gallons	23,811,000	25,520,000	26,115,000	26,625,000	27,175,000	27,645,000
Tank 300 Total Flow	Gallons	11,938,000	14,290,000	15,068,000	15,718,000	16,428,000	17,035,000
Tank 400 Total Flow	Gallons	99,478,000	01,600,000	02,305,000	02,915,000	03,578,000	04,140,000
Tank 500 Total Flow	Gallons	27,289,000	29,776,000	30,600,000	31,201,000	32,047,000	32,685,000
Tank 600 Total Flow	Gallons	90,585,000	92,578,000	93,233,000	93,785,000	94,385,000	94,897,000
System Influent Pressure	PSI	75	74	76	75	78	77
System Effluent Pressure	PSI	59	62	65	63	66	65
System Differential Pressure	PSI	11.9	12.2	11.8	11.9	11.9	11.9
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.68	1.89	1.65	1.96	1.84	1.88
Effluent Water pH - Inline	Units	6.7	6.8	6.8	6.8	6.9	6.9
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.66	1.88	1.65	1.93	1.82	1.87
Manual pH check (ex: Hanna)	Units	—					

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	7-8-2022	7-11-2022	7-12-2022	7-13-2022	7-14-2022	7-15-2022
Tank 900A Hypochlorite Level	Gallons	141	143	122	112	151	151
Tank 900B Hypochlorite Level	Gallons	143	145	96	55	153	123
Tank 900C Hypochlorite Level	Gallons	148	157	131	131	151	151
Tank 900A Polyphosphate Level	Gallons	95	46	29	12	12	138
Tank 900B Polyphosphate Level	Gallons	125	90	81	78	61	141
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						
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Cl2 Delv	Cl2 Delv.			Cl Delv	Phos. Delv. changed flow / PH chart

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	7-18-2022	7-19-2022	7-20-2022	7-21-2022	7-22-22	7-25-2022
System Flow Rate	GPM	3250	3150	3250	3550	3500	3500
Total System Flow	Gallons	7934385	7938120	7941714	7946066	7949914	7962420
Well 3 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	ON
Tank 100 Flow Rate	GPM	500	500	550	550	550	550
Tank 200 Flow Rate	GPM	500	500	600	600	550	550
Tank 300 Flow Rate	GPM	600	550	600	650	650	650
Tank 400 Flow Rate	GPM	600	600	600	700	650	650
Tank 500 Flow Rate	GPM	650	600	600	700	700	700
Tank 600 Flow Rate	GPM	500	500	500	550	600	600
Tank 100 Total Flow	Gallons	89,137,000	89,677,000	90,111,000	90,687,000	91,414,000	93,297,000
Tank 200 Total Flow	Gallons	29,983,000	29,682,000	30,041,000	30,708,000	31,329,000	33,058,000
Tank 300 Total Flow	Gallons	19,983,000	19,645,000	20,287,000	21,077,000	21,775,000	24,017,000
Tank 400 Total Flow	Gallons	08,965,000	09,641,000	09,274,000	07,898,000	08,531,000	10,585,000
Tank 500 Total Flow	Gallons	34,760,000	35,483,000	36,047,000	37,001,000	37,744,000	40,140,000
Tank 600 Total Flow	Gallons	96,542,000	97,104,000	97,581,000	98,274,000	98,892,000	00,725,000
System Influent Pressure	PSI	80	82	90	80	79	77
System Effluent Pressure	PSI	69	71	79	66	56	56
System Differential Pressure	PSI	11.7	11.5	11.8	13.2	13.5	14.2
Chlorine Analyzer: Free Chlorine Residual - inline	PPM	1.92	1.97	1.87	1.91	1.83	1.81
Effluent Water pH - inline	Units	7.0	6.9	7.0	7.0	6.9	6.9
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.90	1.95	1.85	1.90	1.81	1.80
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	7.18.2022	7.19.2022	7.20.2022	7.21.2022	7.22.22	7.25.2022
Tank 900A Hypochlorite Level	Gallons	145	145	110	90	140	144
Tank 900B Hypochlorite Level	Gallons	143	100	80	101	143	145
Tank 900C Hypochlorite Level	Gallons	145	140	140	50	145	146
Tank 900A Polyphosphate Level	Gallons	82	63	41	39	27	130
Tank 900B Polyphosphate Level	Gallons	141	128	128	106	94	110
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						
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		CL Delv.				CL Delv.	CL. Delv. Phos. Delv

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	7.26.2022	7.27.2022	7.28.2022	7.29.2022		
System Flow Rate	GPM	3250	3250	1900	3550		
Total System Flow	Gallons	7965596	7969163	7973012	7975939		
Well 3 Status	ON OR OFF	ON	ON	OFF	ON		
Well 4 Status	ON OR OFF	ON	ON	ON	ON		
Tank 100 Flow Rate	GPM	500	500	o/c	650		
Tank 200 Flow Rate	GPM	500	450	o/c	650		
Tank 300 Flow Rate	GPM	600	600	500	600		
Tank 400 Flow Rate	GPM	650	600	500	600		
Tank 500 Flow Rate	GPM	650	650	550	650		
Tank 600 Flow Rate	GPM	500	550	500	550		
Tank 100 Total Flow	Gallons	93,750,000	94,266,000	94,823,000	95,050,000		
Tank 200 Total Flow	Gallons	33,497,000	33,988,000	34,516,000	34,758,000		
Tank 300 Total Flow	Gallons	24,579,000	25,212,000	25,899,000	26,511,000		
Tank 400 Total Flow	Gallons	11,114,000	11,714,000	12,324,000	12,920,000		
Tank 500 Total Flow	Gallons	40,741,000	41,421,000	42,158,000	42,813,000		
Tank 600 Total Flow	Gallons	01,240,000	01,769,000	02,318,000	02,852,000		
System Influent Pressure	PSI	81	76	75	67		
System Effluent Pressure	PSI	67	64	64	57		
System Differential Pressure	PSI	14.0	13.8	11.0	10.1		
Chlorine Analyzer: Free Chlorine Residual - inline	PPM	1.94	1.13	1.86	1.75		
Effluent Water pH - inline	Units	6.9	6.9	6.9	7.0		
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.92	1.09	1.71	1.69		
Manual pH check (ex: Henna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	7.26.2022	7.27.2022	7.28.2022	7.29.2022		
Tank 900A Hypochlorite Level	Gallons	132	121	150	140		
Tank 900B Hypochlorite Level	Gallons	105	65	145	105		
Tank 900C Hypochlorite Level	Gallons	141	141	141	141		
Tank 900A Polyphosphate Level	Gallons	139	120	102	140		
Tank 900B Polyphosphate Level	Gallons	149	141	141	141		
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						
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		Replaced Smoke Senson South End of building Replaced outside lights (3) Phos. Delv.		Backwash GAC 1 & 2 Cl Delv.	Put GAC's 1&2 Back In Service 10:25 p.m Phos. Delv.		