3 February 2023

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

Subject: **January 2023 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 January 2023. **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 not monitored and recorded using the on-site Leviton Series 2000 Multiple Meter Unit. Summary energy consumption reports are provided separately to the Navy Remedial Project Manager.

A summary of the system operating data recorded in January 2023 is presented below in **Table 1**.

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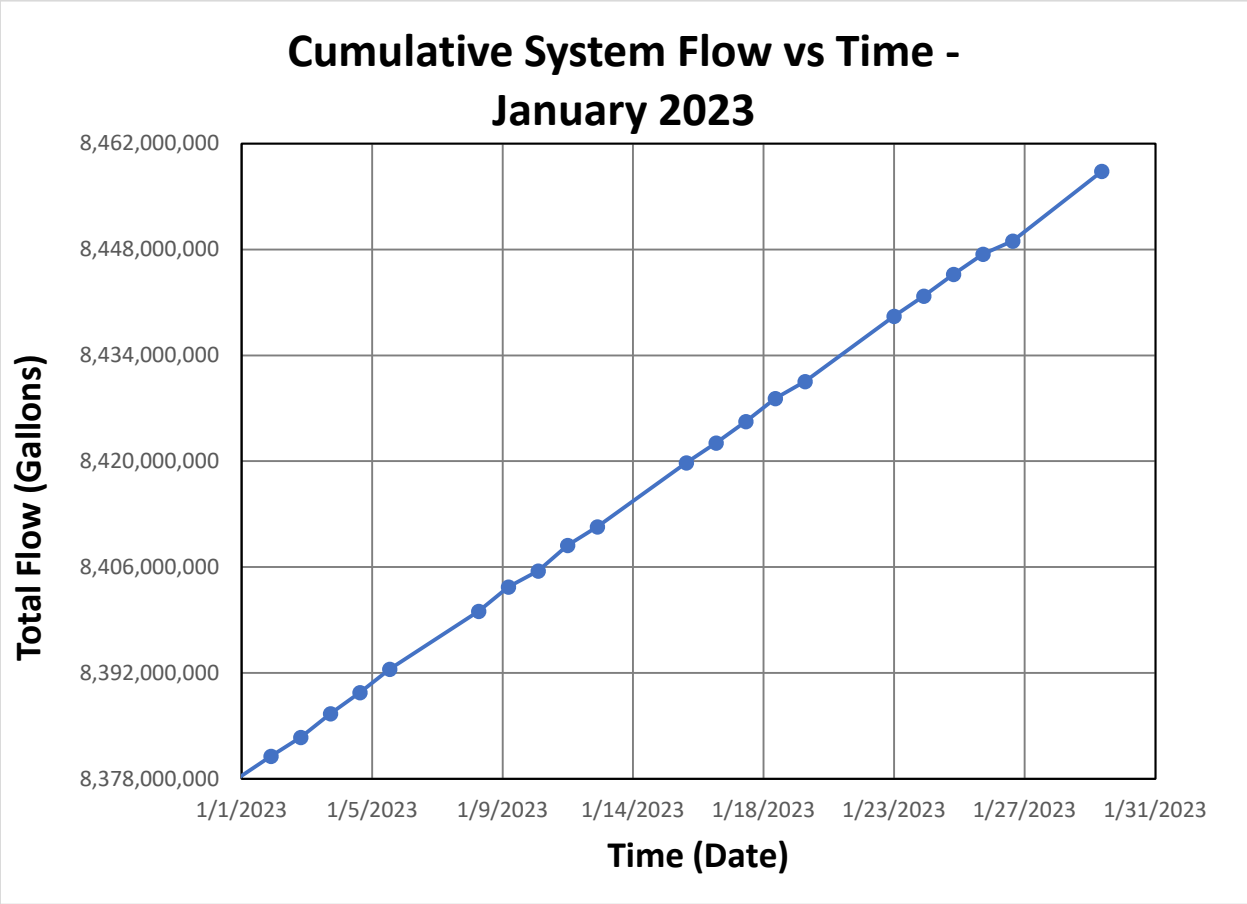
Table 1 - *System Operating Data for January 2023*

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]
1/2/2023	8,381,002,000	1,950	72	67	5.3	1.46 read 1.52 manual	6.70 read
1/3/2023	8,383,511,000	1,950	73	67	5.5	1.63 read 1.65 manual	6.80 read
1/4/2023	8,386,609,000	2,000	77	71	5.6	1.44 read 1.49 manual	6.65 read
1/5/2023	8,389,407,000	2,000	68	63	5.5	1.45 read 1.49 manual	6.59 read
1/6/2023	8,392,503,000	1,900	82	77	5.5	1.73 read 1.79 manual	6.60 read
1/9/2023	8,400,187,000	2,050	67	62	5.7	1.52 read 1.60 manual	6.70 read
1/10/2023	8,403,379,000	2,000	74	68	5.7	1.53 read 1.62 manual	6.70 read
1/11/2023	8,405,522,000	1,900	74	69	5.5	1.67 read 1.73 manual	6.70 read
1/12/2023	8,408,880,000	1,800	78	72	5.4	1.57 read 1.63 manual	--
1/13/2023	8,411,326,000	1,950	66	60	6.0	1.56 read 1.61 manual	6.80 read
1/16/2023	8,419,808,000	2,050	63	57	6.5	1.50 read 1.63 manual	6.50 read
1/17/2023	8,422,424,000	1,850	80	74	6.8	1.72 read 1.81 manual	6.80 read
1/18/2023	8,425,262,000	1,900	77	71	6.4	1.68 read 1.74 manual	6.90 read
1/19/2023	8,428,299,000	2,050	69	62	6.5	1.48 read 1.58 manual	6.90 read
1/20/2023	8,430,545,000	1,850	88	82	6.1	1.44 read 1.52 manual	6.90 read
1/23/2023	8,439,179,000	1,850	78	72	6.2	1.52 read 1.60 manual	6.80 read
1/24/2023	8,441,855,000	1,800	81	72	9.0	1.54 read 1.62 manual	6.60 read
1/25/2023	8,444,722,000	1,850	82	73	9.1	1.47 read 1.55 manual	6.60 read
1/26/2023	8,447,403,000	1,800	61	55	6.1	2.00 read 2.21 manual	6.20 read
1/27/2023	8,449,131,000	2,050	57	50	6.5	1.80 read 1.94 manual	6.70 read
1/30/2023	8,458,375,000	--	9	9	0.6	1.60 read --	6.60 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 January 2023. Over 82.7 million gallons of water were treated in January 2023, bringing the total cumulative volume of water treated since startup to over 8. 45 billion gallons.

Figure 1 - ***Volume of Water Treated through Full Scale GAC System (January 2023)***



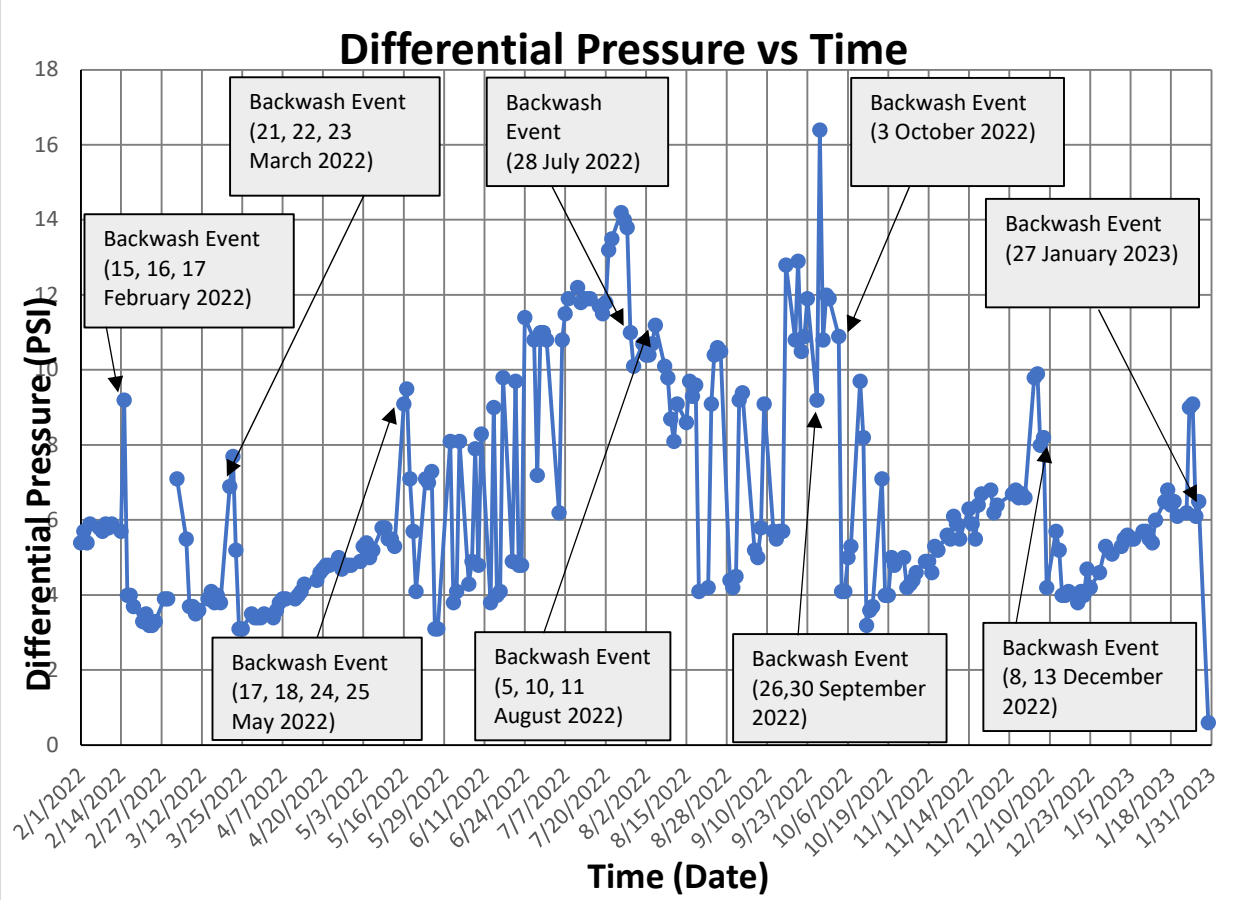
In general, differential pressure increases as the system continues to operate, and decreases after a backwashing event. The increasing trend then continues until the next backwashing event is performed. Also, lower differential pressures are observed during times of low water demand (e.g., typically over the winter months). **Figure 2,** below, depicts the pressure loss across the GAC System and subsequent backwashing dates, from February 2022 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 - 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 was operated in place of Well 4S on 25 -27 January.

In addition, the following non-routine activities or operation issues occurred during the January 2023 reporting period:

- On 25 January, GACs #100 and #200 were backwashed following the 2023 First Quarter microbiological (MIC) sampling.
- On 26 January, GACs #500 and #600 were backwashed following the 2023 First Quarter microbiological (MIC) sampling.
- On 27 January, GACs #300 and #400 were backwashed following the 2023 First Quarter microbiological (MIC) sampling.
- On 30 January, the plant was taken offline to facilitate upgrading of the LNYW iron filtration 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
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ATTACHMENT 1

O&M LOGS – JANUARY 2023

Daily Readings
Granular Activated Carbon Treatment System

Description	Data	1.2.2022	1.3.2023	1.4.2023	1.5.2023	1.6.2023	1.9.2023
System Flow Rate	GPM	1950	1950	2000	2000	1900	2050
Total System Flow	Gallons	8464874	8467383	8470481	8473279	8476375	8484055
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	225	250
Tank 200 Flow Rate	GPM	225	225	250	250	225	250
Tank 300 Flow Rate	GPM	350	350	350	350	300	350
Tank 400 Flow Rate	GPM	350	350	350	350	350	400
Tank 500 Flow Rate	GPM	350	350	350	350	350	350
Tank 600 Flow Rate	GPM	300	300	300	300	300	300
Tank 100 Total Flow	Gallons	60,804,000	61,108,000	61,483,000	61,850,000	62,214,000	63,175,000
Tank 200 Total Flow	Gallons	99,876,000	00,098,000	00,597,000	00,711,000	1,004,000	03,039,000
Tank 300 Total Flow	Gallons	11,083,000	11,328,000	11,861,000	12,497,000	12,821,000	14,385,000
Tank 400 Total Flow	Gallons	97,265,000	97,573,000	98,278,000	98,950,000	99,572,000	01,111,000
Tank 500 Total Flow	Gallons	35,385,000	35,409,000	36,041,000	36,820,000	37,008,000	38,923,000
Tank 600 Total Flow	Gallons	76,881,000	76,989,000	77,509,000	78,119,000	80,501,000	81,411,000
System Influent Pressure	PSI	72	73	77	68	82	67
System Effluent Pressure	PSI	67	67	71	63	77	62
System Differential Pressure	PSI	5.3	5.5	56	5.5	55	5.7
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.46	1.63	1.64	1.45	1.73	1.52
Effluent Water pH - Inline	Units	6.7	6.8	6.65	6.59	6.6	6.70
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.52	1.65	1.79	1.49	1.79	1.60
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	1.2.2023	1.3.2023	1.4.2023	1.5.2023	1.6.2023	1.9.2023
Tank [illegible]A Hypochlorite Level	Gallons	66	150	113	80	60	140
Tank [illegible]B Hypochlorite Level	Gallons	41	146	140	130	110	50
Tank [illegible]C Hypochlorite Level	Gallons	65	150	150	150	150	105
Tank [illegible]A Polyphosphate Level	Gallons	82	140	118	100	80	51
Tank [illegible]B Polyphosphate Level	Gallons	140	150	150	150	140	140
Metering Pump [illegible]A: Hypochlorite Output Pressure	PSI						
Metering Pump [illegible]B: Hypochlorite Output Pressure	PSI						
Metering Pump [illegible]A: Phosphate Output Pressure	PSI						
Metering Pump [illegible]B: Phosphate Output Pressure	PSI						
Metering Pump [illegible]A: Stroke/Speed	Units						
Metering Pump [illegible]B: Stroke/Speed	Units						
Metering Pump [illegible]A: Stroke/Speed	Units						
Metering Pump [illegible]B: Stroke/Speed	Units						
Generator Operating Hours	Hours	187.8	187.8	187.8	187.8	188.2	188.2
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)			CL Delv Phos. Delv		Monthly Sampling Fe Sampling	Change flow/ph Charts	

Daily Readings
Granular Activated Carbon Treatment System

Description	Data	1.10.2023	1.11.2023	1.12.2023	1.13.2023	1.16.2023	1.17.2023
System Flow Rate	GPM	2000	1900	1800	1950	2050	1850
Total System Flow	Gallons	8487251	8489394	8492752	8495198	8503680	8506296
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	300	250
Tank 200 Flow Rate	GPM	250	225	250	250	250	250
Tank 300 Flow Rate	GPM	350	325	325	350	350	325
Tank 400 Flow Rate	GPM	400	350	350	400	400	350
Tank 500 Flow Rate	GPM	350	350	350	350	350	350
Tank 600 Flow Rate	GPM	300	300	250	250	300	250
Tank 100 Total Flow	Gallons	63,581,000	63,807,000	64,276,000	64,620,000	65,632,000	65,960,000
Tank 200 Total Flow	Gallons	03,303,000	03,577,000	03,797,000	04,103,000	06,264,000	06,511,000
Tank 300 Total Flow	Gallons	14,935,000	15,301,000	15,815,000	16,344,000	17,733,000	18,175,000
Tank 400 Total Flow	Gallons	01,751,000	02,179,000	02,848,000	03,298,000	05,133,000	05,559,000
Tank 500 Total Flow	Gallons	39,519,000	39,915,000	40,498,000	40,979,000	42,585,000	43,041,000
Tank 600 Total Flow	Gallons	81,620,000	80,812,000	80,997,000	81,402,000	82,605,000	82,989,000
System Influent Pressure	PSI	74	74	78	66	63	80
System Effluent Pressure	PSI	68	69	72	60	57	74
System Differential Pressure	PSI	5.7	5.5	5.4	6.0	6.5	6.8
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	6.7	6.7	1.57	1.56	1.50	1.72
Effluent Water pH - Inline	Units	1.53	1.67	1.7	6.8	6.5	6.8
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.62	1.73	1.63	1.61	1.63	1.81
Manual pH check (ex: Hanna)	Units	—	—				

Daily Readings
Granular Activated Carbon Treatment System

Description	Units	1.10.2023	1.11.2023	1.12.2023	1.13.2023	1.16.2023	1.17.2023
Tank 550A Hexadecanoic Level	Gallons	138	105	150	145	141	85
Tank 550B Hexadecanoic Level	Gallons	117	107	146	107	55	160
Tank 550C Hexadecanoic Level	Gallons	10	10	144	143	80	50
Tank 550A Pentadecanoic Level	Gallons	34	131	111	94	41	30
Tank 550B Pentadecanoic Level	Gallons	140	151	151	151	151	151
Metering Pump 560A: Hexadecanoic Outlet Pressure	PSI						
Metering Pump 560B: Hexadecanoic Outlet Pressure	PSI						
Metering Pump 560A: Pentadecanoic Outlet Pressure	PSI						
Metering Pump 560B: Pentadecanoic Outlet Pressure	PSI						
Metering Pump 560A: Strokes/Minute	Units						
Metering Pump 560B: Strokes/Minute	Units						
Metering Pump 560A: Strokes/Minute	Units						
Metering Pump 560B: Strokes/Minute	Units						
Generator Operating Hours	Hours	188.2	188.2	188.2	188.4	188.4	188.4
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)			Phos. Delv. & Delv.				

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	1.18.2023	1.19.2023	1.20.23	1.23.2023	1.24.2023	1.25.2023
System Flow Rate	GPM	1900	2050	1850	1850	1800	1850
Total System Flow	Gallons	8509134	8512171	8514417	8523051	8525727	8528594
Well 3 Status	ON OR OFF	OFF	OFF	OFF	OFF	OFF	ON
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	OFF
Tank 100 Flow Rate	GPM	250	250	225	250	o/c	o/c
Tank 200 Flow Rate	GPM	250	250	250	225	o/c	o/c
Tank 300 Flow Rate	GPM	350	350	325	325	450	450
Tank 400 Flow Rate	GPM	350	400	350	350	450	500
Tank 500 Flow Rate	GPM	350	350	350	350	500	500
Tank 600 Flow Rate	GPM	250	250	250	350	400	400
Tank 100 Total Flow	Gallons	66,308,000	66,658,000	66,964,000	68,878,000	69,876,000	—
Tank 200 Total Flow	Gallons	06,797,000	07,131,000	07,310,000	01,117,000	01,475,000	—
Tank 300 Total Flow	Gallons	18,655,000	19,130,000	19,533,000	21,06,000	21,475,000	22,118,000
Tank 400 Total Flow	Gallons	06,028,000	06,587,000	07,071,000	08,886,000	09,423,000	10,153,000
Tank 500 Total Flow	Gallons	43,564,000	44,080,000	44,526,000	46,158,000	46,665,000	47,422,000
Tank 600 Total Flow	Gallons	83,405,000	83,814,000	84,169,000	85,459,000	85,858,000	86,447,000
System Influent Pressure	PSI	67	69	68	78	81	82
System Effluent Pressure	PSI	71	62	62	72	72	73
System Differential Pressure	PSI	6.4	6.5	6.1	6.2	9.0	9.1
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.68	1.48	1.441	1.52	1.54	1.47
Effluent Water pH - Inline	Units	6.9	6.9	6.9	6.8	6.6	6.6
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.74	1.858	1.52	1.60	1.62	1.55
Manual pH check (ex: Hanna)	Units	—	—				

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	1.18.2023	1.19.2023	1.20.23	1.23.2023	1.24.2023	1.25.2023
Tank [illegible]A Hypochlorite Level	Gallons	80	143	143	142	141	140
Tank [illegible]B Hypochlorite Level	Gallons	134	145	112	5	120	90
Tank [illegible]C Hypochlorite Level	Gallons	50	144	144	144	—	—
Tank [illegible]A Polyphosphate Level	Gallons	15	—	—	—	—	—
Tank [illegible]B Polyphosphate Level	Gallons	150	150	150	117	103	90
Metering Pump [illegible]A: Hypochlorite Output Pressure	PSI						
Metering Pump [illegible]B: Hypochlorite Output Pressure	PSI						
Metering Pump [illegible]A: Phosphate Output Pressure	PSI						
Metering Pump [illegible]B: Phosphate Output Pressure	PSI						
Metering Pump [illegible]A: Stroke/Speed	Units						
Metering Pump [illegible]B: Stroke/Speed	Units						
Metering Pump [illegible]A: Stroke/Speed	Units						
Metering Pump [illegible]B: Stroke/Speed	Units						
Generator Operating Hours	Hours	188.4	188.4	188.9	188.9	188.9	188.9
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)			Cl Deli			Closed GAC 1+2	Sampling GAC 1+2 Well 3 Bats Monthly Sampling 1,4 Dioxane POC's

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	1.26.2023	1.27.2023	1.30.2023			
System Flow Rate	GPM	1800	2050	o/c			
Total System Flow	Gallons	8531275	8533003	8542247			
Well 3 Status	ON OR OFF	ON	ON	OFF			
Well 4 Status	ON OR OFF	OFF	OFF	OFF			
Tank 100 Flow Rate	GPM	350	400	0			
Tank 200 Flow Rate	GPM	350	400	0			
Tank 300 Flow Rate	GPM	400	o/c	0			
Tank 400 Flow Rate	GPM	350	o/c	0			
Tank 500 Flow Rate	GPM	o/c	500	0			
Tank 600 Flow Rate	GPM	o/c	400	0			
Tank 100 Total Flow	Gallons	69,984,000	69,988,000	70,415,000			
Tank 200 Total Flow	Gallons	01,775,000	02,038,000	03,645,000			
Tank 300 Total Flow	Gallons	22,860,000	23,224,000	24,038,000			
Tank 400 Total Flow	Gallons	10,845,000	11,210,000	12,023,000			
Tank 500 Total Flow	Gallons	47,798,000	48,135,000	49,962,000			
Tank 600 Total Flow	Gallons	86,736,000	87,815,000	88,560,000			
System Influent Pressure	PSI	61	57	9			
System Effluent Pressure	PSI	55	50	9			
System Differential Pressure	PSI	6.1	6.5	.6			
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	2.0	1.8	1.6 o/c			
Effluent Water pH - Inline	Units	6.2	6.7	6.6			
Manual Chlorine Reading (ex: Hach kit)	PPM	2.21	1.94	—			
Manual pH check (ex: Hanna)	Units	—	—	—			

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	1-26-2023	1-27-2023	1-30-2023			
Tank 324A Hypochlorite Level	Gallons	143	111	80			
Tank 324B Hypochlorite Level	Gallons	145	145	145			
Tank 324C Hypochlorite Level	Gallons	140	140	143			
Tank 324A Polyphosphate Level	Gallons	—	—	—			
Tank 324B Polyphosphate Level	Gallons	110	90	64			
Metering Pump 324A: Hypochlorite Output Pressure	PSI						
Metering Pump 324B: Hypochlorite Output Pressure	PSI						
Metering Pump 324A: Phosphate Output Pressure	PSI						
Metering Pump 324B: Phosphate Output Pressure	PSI						
Metering Pump 324A: Stroke/Speed	Units						
Metering Pump 324B: Stroke/Speed	Units						
Metering Pump 324A: Stroke/Speed	Units						
Metering Pump 324B: Stroke/Speed	Units						
Generator Operating Hours	Hours	1889	1889				
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)		CL Delv. Bacti Sampling LGAC 5&6 Tank 324 O/C	Sampled Bacti - GAC's 324 Backwashing 324				