9 August 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: **July 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.

On 30 January 2023, the plant was taken off-line by Liberty Utilities to support rehabilitation of the iron filtration plant. The plant remained off-line until 4 May 2023, at which time the plant resumed normal operation.

This report documents the routine operation and maintenance of the GAC System performed during the month of July 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.

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

KOMAN Government Solutions, LLC
180 Gordon Drive, Suite 110
Exton, Pennsylvania 19341
Phone (610) 363-3000
Fax (610) 363-3001
www.komangs.com

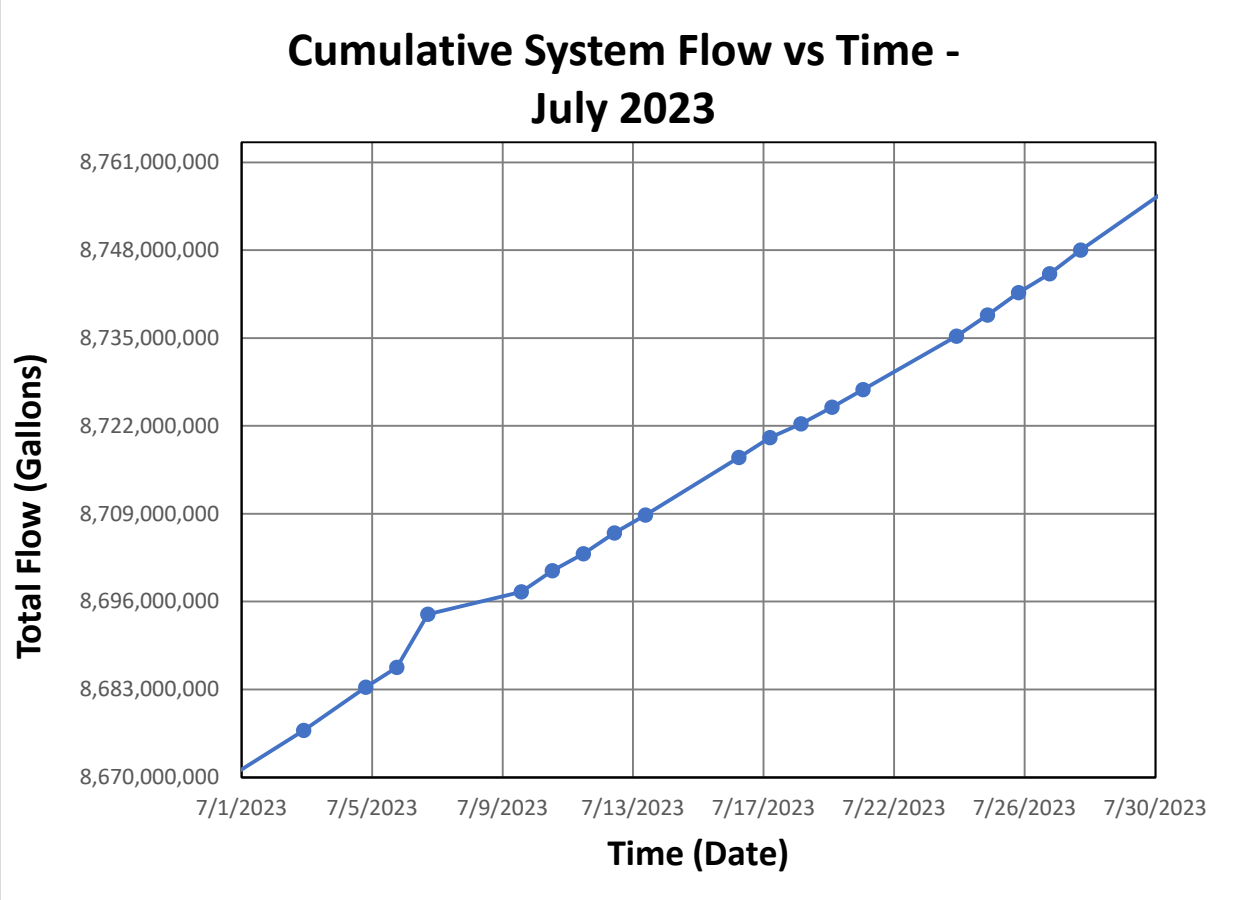
Table 1 - ***System Operating Data for July 2023***

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]
7/3/2023	8,676,912,000	3,150	85	77	8.8	1.79 read 1.81 manual	7.21 read
7/5/2023	8,683,299,000	3,350	82	72	10.2	1.83 read 1.81 manual	7.19 read
7/6/2023	8,686,267,000	3,350	76	66	10.2	1.51 read 1.50 manual	7.35 read
7/7/2023	8,694,132,000	3,350	65	54	10.3	1.63 read 1.62 manual	7.03 read
7/10/2023	8,697,407,000	1,650	59	56	3.3	1.70 read 1.71 manual	7.15 read
7/11/2023	8,700,553,000	1,550	50	53	2.9	1.73 read 1.71 manual	7.12 read
7/12/2023	8,703,083,000	3,400	70	60	10.1	1.63 read 1.65 manual	7.21 read
7/13/2023	8,706,117,000	3,375	75	65	10.0	1.71 read 1.70 manual	7.20 read
7/14/2023	8,708,784,000	1,500	47	45	2.7	1.79 read 1.76 manual	7.17 read
7/17/2023	8,717,336,000	1,600	58	54	3.9	1.57 read 1.59 manual	7.15 read
7/18/2023	8,720,272,000	1,600	45	42	2.9	1.63 read 1.65 manual	7.18 read
7/19/2023	8,722,306,000	1,850	64	60	3.9	1.49 read 1.47 manual	6.81 read
7/20/2023	8,724,771,000	1,900	55	51	3.9	1.57 read 1.55 manual	6.85 read
7/21/2023	8,727,347,000	1,850	42	39	3.8	1.80 read 1.78 manual	6.87 read
7/24/2023	8,735,242,000	1,900	58	54	3.9	1.51 read 1.50 manual	6.79 read
7/25/2023	8,738,377,000	1,950	52	48	3.9	1.65 read 1.66 manual	6.98 read
7/26/2023	8,741,685,000	2,050	69	65	4.0	1.41 read 1.43 manual	7.00 read
7/27/2023	8,744,483,000	3,550	68	56	11.2	1.58 read 1.55 manual	6.97 read
7/28/2023	8,748,016,000	3,100	87	78	10.0	1.55 read 1.54 manual	6.98 read
7/31/2023	8,757,683,000	3,175	85	75	10.6	1.37 read 1.36 manual	7.15 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 illustrates the volume of water treated by the GAC System since system startup, with the increment for the month of July 2023. Over 86.3 million gallons of water were treated in July 2023, bringing the total cumulative volume of water treated since startup to over 8.75 billion gallons.

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



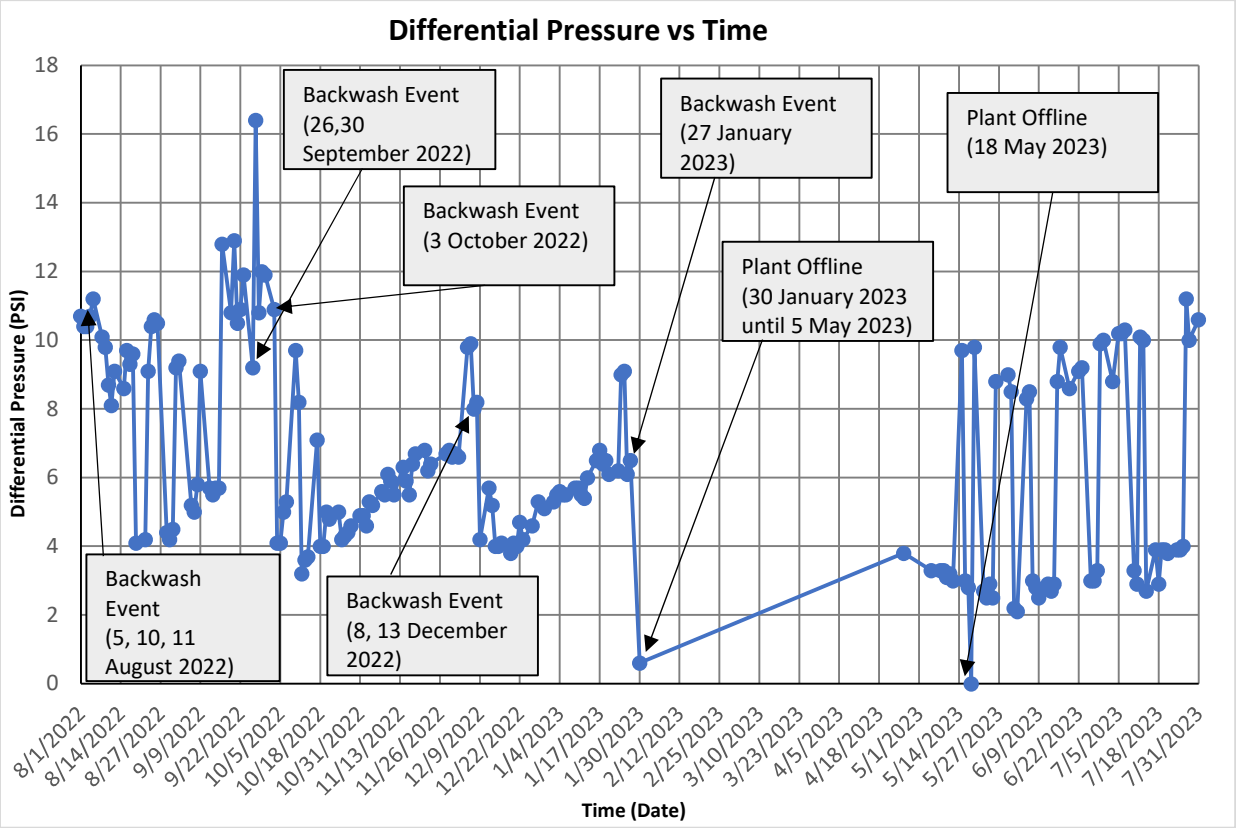
In general, differential pressure increases as the system continues to operate, and decreases after a backwashing event. The increasing trend then continues until the next backwashing event is performed. Also, lower differential pressures are observed during times of low water demand (e.g., typically over the winter months). **Figure 2,** below, depicts the pressure loss across the GAC System and subsequent backwashing dates, from August 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 most recently 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 and flushing events were incorporated into the standard process for bacteria sampling. However, with the recently completed rehabilitation of the Liberty Utilities iron filtration plant, it is anticipated that additional backwashing will be limited or no longer required.

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 operation of Well 3A in place of or concurrently with Well 4S occurs on an irregular schedule; Well 3A operated concurrently with Well 4S on 3-7 July, 12-13 July, and 27-31 July. Well 3A ran in place of Well 4S on 14 July and 19-25 July.

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

- On 19 July, the plant was offline for approximately 2.5 hours due to a power outage caused by inclement weather.

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
R. Moore - Tetra Tech
J. Pelton – NYSDEC
K. Granzen – NYSDEC
M. Travis – NYSDEC

ATTACHMENT 1

O&M LOGS – JULY 2023

Daily Readings
Granular Activated Carbon Treatment System

Description	Data	6.28.2023	6.29.2023	6.30.2023	7.3.2023	7.5.2023	7.6.2023
System Flow Rate	GPM	1850	3350	3400	3150	3350	3350
Total System Flow	Gallons	8747784	8749304	8752110	8760984	8767178	8770139
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	550	500	500	600
Tank 200 Flow Rate	GPM	250	450	500	500	500	500
Tank 300 Flow Rate	GPM	250	550	600	550	600	600
Tank 400 Flow Rate	GPM	250	500	550	550	650	600
Tank 500 Flow Rate	GPM	300	550	600	600	650	550
Tank 600 Flow Rate	GPM	250	350	450	450	500	500
Tank 100 Total Flow	Gallons	93,411,000	93,711,000	94,112,000	95,325,000	95,911,000	96,511,000
Tank 200 Total Flow	Gallons	47,381,000	47,728,000	48,080,000	49,238,000	49,987,000	50,497,000
Tank 300 Total Flow	Gallons	49,007,000	49,587,000	50,019,000	51,465,000	52,287,000	52,807,000
Tank 400 Total Flow	Gallons	45,987,000	46,418,000	46,947,000	47,485,000	48,301,000	48,583,000
Tank 500 Total Flow	Gallons	78,442,000	78,863,000	79,355,000	80,871,000	81,996,000	82,411,000
Tank 600 Total Flow	Gallons	08,893,000	09,411,000	08,753,000	10,863,000	11,507,000	11,912,000
System Influent Pressure	PSI	79	80	78	85	82	76
System Effluent Pressure	PSI	76	71	68	77	72	66
System Differential Pressure	PSI	3.3	9.9	10.0	8.8	10.2	10.2
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.68	1.71	1.74	1.79	1.83	1.51
Effluent Water pH - Inline	Units	6.59	6.85	7.31	7.21	7.19	7.35
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.71	1.70	1.72	1.81	1.81	1.50
Manual pH check (ex: Hanna)	Units						

Daily Readings
Granular Activated Carbon Treatment System

Description	Units	6.28.2023	6.29.2023	6.30.2023	7-3-23	7-5-2023	7-6-2023
Tank 1A: Hexachlorite Level	Gallons	84	154	121	92	153	109
Tank 1B: Hexachlorite Level	Gallons	145	155	141	117	155	141
Tank 2A: Hexachlorite Level	Gallons	154	154	154	105	156	156
Tank 2A: Polychlorinate Level	Gallons	143	120	105	63	26	148
Tank 2B: Polychlorinate Level	Gallons	161	161	161	161	160	160
Metering Pump 1A: Hexachlorite Output Pressure	PSI						
Metering Pump 1B: Hexachlorite Output Pressure	PSI						
Metering Pump 2A: Phosphate Output Pressure	PSI						
Metering Pump 2B: Phosphate Output Pressure	PSI						
Metering Pump 1A: Stroke/Speed	Units						
Metering Pump 1B: Stroke/Speed	Units						
Metering Pump 2A: Stroke/Speed	Units						
Metering Pump 2B: Stroke/Speed	Units						
Generator Operating Hours	Hours	O/L	O/L	O/L	O/L	O/L	O/L
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, conversations on site, etc.)						CL Delv.	Monthly Sampling Phas. Delv.

Daily Readings
Granular Activated Carbon Treatment System

Description	Units	7.8.2023	7.10.2023	7.11.2023	7.12.2023	7.13.2023	7.14.2023
System Flow Rate	GPM	3350	1650	1550	3400	3375	1500
Total System Flow	Gallons	8778004	8781279	8784425	8786955	8789989	8792656
Well 3 Status	ON OR OFF	ON	OFF	OFF	ON	ON	ON
Well 4 Status	ON OR OFF	ON	ON	ON	ON	ON	OFF
Tank 100 Flow Rate	GPM	600	250	250	550	550	250
Tank 200 Flow Rate	GPM	500	250	250	550	550	225
Tank 300 Flow Rate	GPM	600	250	250	500	600	250
Tank 400 Flow Rate	GPM	550	300	250	550	550	250
Tank 500 Flow Rate	GPM	650	300	300	600	550	300
Tank 600 Flow Rate	GPM	500	200	200	450	450	225
Tank 100 Total Flow	Gallons	97023,000	98,465,000	98941,000	99,329,000	99,775,000	00,187,000
Tank 200 Total Flow	Gallons	50,971,000	52,323,000	52,783,000	53,135,000	53,579,000	53,995,000
Tank 300 Total Flow	Gallons	53,311,000	54,911,000	55,487,000	55,857,000	56,360,000	56,797,000
Tank 400 Total Flow	Gallons	48,881,000	50,115,000	50,553,000	50,934,000	51,378,000	51,726,000
Tank 500 Total Flow	Gallons	82,818,000	84,481,000	85,502,000	86,411,000	86,940,000	86,417,000
Tank 600 Total Flow	Gallons	12,387,000	13,688,000	14,125,000	14,481,000	14,859,000	15,218,000
System Influent Pressure	PSI	65	59	50	70	75	47
System Effluent Pressure	PSI	54	56	53	60	65	45
System Differential Pressure	PSI	10.3	3.3	2.9	10.1	10.0	2.7
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.63	1.70	1.77	1.63	1.71	1.79
Effluent Water pH - Inline	Units	7.03	7.15	7.12	7.21	7.20	7.17
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.62	1.71	1.71	1.65	1.70	1.76
Manual pH check (ex: Hanna)	Units	—					

Daily Readings
Granular Activated Carbon Treatment System

Description	Units	7.8.2023	7.10.2023	7.11.2023	7.12.2023	7.13.2023	7.14.2023
Tank 89RA Hexadecanoic Level	Gallons	84	81	149	91	115	149
Tank 89RB Hexadecanoic Level	Gallons	121	115	153	130	130	152
Tank 89RC Hexadecanoic Level	Gallons	153	112	155	155	101	155
Tank 89RA Pentadecanoic Level	Gallons	121	60	158	125	107	87
Tank 89RB Pentadecanoic Level	Gallons	160	160	160	160	166	166
Metering Pump 89RA: Hexadecanoic Output Pressure	PSI						
Metering Pump 89RB: Hexadecanoic Output Pressure	PSI						
Metering Pump 89RA: Pentadecanoic Output Pressure	PSI						
Metering Pump 89RB: Pentadecanoic Output Pressure	PSI						
Metering Pump 89RA: Strokes/Sec	Units						
Metering Pump 89RB: Strokes/Sec	Units						
Metering Pump 89RA: Strokes/Sec	Units						
Metering Pump 89RB: Strokes/Sec	Units						
Generator Operating Hours	Hours	o/c	o/c	o/c	o/c	o/c	o/c
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, conditions on site, etc.)				CL Delv. Phos. Delv.			

Daily Readings
Granular Activated Carbon Treatment System

Description	Data	7.17.2023	7-18-2023	7-19-2023	7.20.2023	7-21-2023	7-84-2023
System Flow Rate	GPM	1600	1600	1850	1900	1850	1900
Total System Flow	Gallons	8801208	8804144	8806178	8808643	8811219	8819114
Well 3 Status	ON OR OFF	OFF	OFF	ON	ON	ON	ON
Well 4 Status	ON OR OFF	ON	ON	OFF	OFF	OFF	OFT
Tank 100 Flow Rate	GPM	250	250	300	300	300	300
Tank 200 Flow Rate	GPM	250	250	250	300	300	300
Tank 300 Flow Rate	GPM	250	250	300	300	300	300
Tank 400 Flow Rate	GPM	250	250	250	250	300	300
Tank 500 Flow Rate	GPM	250	250	350	300	250	300
Tank 600 Flow Rate	GPM	225	200	250	300	250	225
Tank 100 Total Flow	Gallons	01,505,000	01,957,000	02,257,000	02,631,000	03,094,000	04,385,000
Tank 200 Total Flow	Gallons	55,245,000	55,675,000	55,961,000	56,311,000	56,697,000	57,937,000
Tank 300 Total Flow	Gallons	58,231,000	58,720,000	59,047,000	59,441,000	59,873,000	61,263,000
Tank 400 Total Flow	Gallons	53,174,000	53,634,000	53,956,000	54,353,000	54,778,000	00,210,000
Tank 500 Total Flow	Gallons	87,545,000	88,335,000	88,657,000	89,051,000	89,484,000	90,861,000
Tank 600 Total Flow	Gallons	16,249,000	16,761,000	17,044,000	17,360,000	17,711,000	18,395,000
System Influent Pressure	PSI	58	45	64	55	42	58
System Effluent Pressure	PSI	54	42	60	51	39	54
System Differential Pressure	PSI	3.9	2.9	3.9	3.9	3.8	3.9
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.57	1.63	1.49	1.57	1.80	1.51
Effluent Water pH - Inline	Units	7.15	7.18	6.81	6.85	6.87	6.79
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.59	1.65	1.47	1.55	1.78	1.50
Manual pH check (ex: Hanna)	Units	—	—				

Daily Readings
Granular Activated Carbon Treatment System

Description	Data	7-17-2023	7-18-2023	7-19-2023	7-20-2023	7-21-2023	7-24-2023
Tank 5000A Hexadecanoic Level	Gallons	77	151	131	151	151	150
Tank 5000B Hexadecanoic Level	Gallons	129	153	141	153	119	103
Tank 5000C Hexadecanoic Level	Gallons	114	155	155	155	150	78
Tank 5000A Pentadecanoic Level	Gallons	62	60	50	158	124	79
Tank 5000B Pentadecanoic Level	Gallons	109	53	41	164	164	164
Metering Pump 5000A: Hexadecanoic Output Pressure	PSI						
Metering Pump 5000B: Hexadecanoic Output Pressure	PSI						
Metering Pump 5000A: Pentadecanoic Output Pressure	PSI						
Metering Pump 5000B: Pentadecanoic Output Pressure	PSI						
Metering Pump 5000A: Stroke/Speed	Units						
Metering Pump 5000B: Stroke/Speed	Units						
Metering Pump 5000A: Stroke/Speed	Units						
Metering Pump 5000B: Stroke/Speed	Units						
Generator Operating Hours	Hours	O/L	O/L	O/L	O/L	O/L	O/L
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, contractors on site, etc.)			CL Delv.	System Down for 2½ hrs. Power outage	CL Delv. Phos. Delv Changed charts flow/PH		

Daily Readings
Granular Activated Carbon Treatment System

Description	Date	7.25.2023	7.26.2023	7.27.2023	7.28.2023	7.31.2023	
System Flow Rate	GPM	1950	2050	3550	3100	3175	
Total System Flow	Gallons	8822749	8825557	8828355	8831886	8841555	
Well 3 Status	ON OR OFF	ON	OFF	ON	ON	ON	
Well 4 Status	ON OR OFF	OFF	ON	ON	ON	ON	
Tank 100 Flow Rate	GPM	300	300	550	500	506	
Tank 200 Flow Rate	GPM	300	300	500	500	500	
Tank 300 Flow Rate	GPM	325	350	600	500	500	
Tank 400 Flow Rate	GPM	300	325	600	450	450	
Tank 500 Flow Rate	GPM	325	350	650	600	500	
Tank 600 Flow Rate	GPM	250	250	500	450	450	
Tank 100 Total Flow	Gallons	04,775,000	05,290,000	05,753,000	06,337,000	07,907,000	
Tank 200 Total Flow	Gallons	58,350,000	58,826,000	59,250,000	59,775,000	61,215,000	
Tank 300 Total Flow	Gallons	61,704,000	62,262,000	62,748,000	63,336,000	65,010,000	
Tank 400 Total Flow	Gallons	00,638,000	00,933,000	01,373,000	01,991,000	03,414,000	
Tank 500 Total Flow	Gallons	91,863,000	92,468,000	92,918,000	93,411,000	94,621,000	
Tank 600 Total Flow	Gallons	19,185,000	19,405,000	20,010,000	20,507,000	21,814,000	
System Influent Pressure	PSI	52	69	68	87	85	
System Effluent Pressure	PSI	48	65	56	78	75	
System Differential Pressure	PSI	39	4.0	11.2	10.0	10.6	
Chlorine Analyzer: Free Chlorine Residual - Inline	PPM	1.65	1.41	1.58	1.55	1.37	
Effluent Water pH - Inline	Units	6.98	7.0	6.97	6.98	7.15	
Manual Chlorine Reading (ex: Hach Kit)	PPM	1.66	1.43	1.55	1.54	1.36	
Manual pH check (ex: Hanna)	Units	—					

Daily Readings
Granular Activated Carbon Treatment System

Description	Units	7-25-2023	7-26-2023	7-27-2023	7-28-2023	7-31-2023	
Tank [illegible] Hexachlorite Level	Gallons	148	120	155	124	88	
Tank [illegible] Hexachlorite Level	Gallons	153	102	154	139	115	
Tank [illegible] Hexachlorite Level	Gallons	155	155	155	155	97	
Tank [illegible] Phosphonosilicate Level	Gallons	64	45	31	14	14	
Tank [illegible] Phosphonosilicate Level	Gallons	164	164	164	164	121	
Metering Pump [illegible]: Hexachlorite Output Pressure	PSI						
Metering Pump [illegible]: Hexachlorite Output Pressure	PSI						
Metering Pump [illegible]: Phosphonite Output Pressure	PSI						
Metering Pump [illegible]: Phosphonite Output Pressure	PSI						
Metering Pump [illegible]: Strokes/Hour	Units						
Metering Pump [illegible]: Strokes/Hour	Units						
Metering Pump [illegible]: Strokes/Hour	Units						
Metering Pump [illegible]: Strokes/Hour	Units						
Generator Operating Hours	Hours	o/c	o/c	o/c	o/c	o/c	
Main Facility Electric Meter Reading							
Comments (additional tasks performed, maintenance needed, conversations on site, etc.)		Contractor on Site Coring holes In North-East corner		Well 4 back in service CL Del. changed flow SPM chart			