

MONTHLY OPERATION REPORT OF THE CITY OF BENTON HARBOR WATER FILTRATION PLANT
SUPPLY NAME: CITY OF BENTON HARBOR | WSSN: 0600

For the month/year of
November-22

County:
Berrien

Abul D. Ahmed
 Certified Operator

F-1
 Water Plant Classification


 Signature

Operator-in-Charge
 Title

Treatment Rate and Filter Data

- | | | |
|----------------------------------|--------------|-----------------------------------|
| 1. Maximum Treatment Rate | <u>4.163</u> | million gallons per day |
| 2. Approved Rated Plant Capacity | <u>8</u> | million gallons per day |
| 3. Average Filter Run | <u>125.5</u> | hours |
| 4. Average Filtration Rate | <u>0.44</u> | gallons per square ft. per minute |
| 5. Maximum Filtration Rate | <u>2.07</u> | gallons per square ft. per minute |
| 6. Average Wash Water Use | <u>0.01</u> | percent of treated water |

Chemical Data

- | | | | |
|-------------------------------------|-------------------|-----------------------------|-----------------|
| 7. Chlorine on hand | <u>39120</u> lbs. | Est. Supply | <u>145</u> days |
| 8. Alum (Al ³⁺) on hand | <u>56927</u> lbs. | Est. Supply | <u>269</u> days |
| 9. Cost of All Chemicals | <u>219.94</u> | dollars per million gallons | |
| 10. Total Power Cost | <u>0.00</u> | dollars per million gallons | |

Remarks

	North Filter	South Filter
Number of filter confluence samples >0.3 NTU	0	0
Number of filter confluence samples collected	73	85
Percent of filter confluence samples >0.3 NTU	0%	0%
Number of filter confluence samples >1 NTU	0	0

Did any individual filter exceed:

- | | |
|--|------------|
| 1.0 NTU in two consecutive measurements taken 15 minutes apart? | No |
| If yes, attach specific filter(s) information and indicate required follow up status. | |
| 0.5 NTU in two consecutive measurements taken 15 minutes apart after 4 hours of operation? | No |
| If yes, attach specific filter(s) information and indicate required follow up status. | |
| 1.0 NTU in two consecutive measurements taken 15 minutes apart for 3 consecutive months? | No |
| If yes, attach specific filter(s) information and indicate required follow up status. | |
| 2.0 NTU in two consecutive measurements taken 15 minutes apart for 2 consecutive months? | No |
| If yes, attach specific filter(s) information and indicate required follow up status. | |
| Did plant tap disinfectant residual fall below 0.2 ppm during the month? | No |
| If yes, indicate date(s) and duration on a separate sheet | |
| Was minimum C*T credit achieved for the entire month? | Yes |
| If no, indicate on a separate sheet the date(s) not achieved | |
| Was continuous POE chlorine residual monitoring equipment off-line during the month? | No |
| If yes, indicate date(s) and duration on a separate sheet | |
| Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? | No |
| If yes, indicate date(s) and duration on a separate sheet. | |

Distribution MGD

Total 23.403 **Average** 0.78 **Max** 0.929 **Min** 0.606

Comments

Interim Cross Connection Control Program update attached as a separate document.

DATE	Million Gallons Treated	Alum Added lbs	Alum Applied as Product mg/L <i>NSF Max 400 mg/L</i>	Alum as Al ³⁺ mg/L	Turbidity Units														
					Raw			Applied	North Filter			South Filter			No. of 2 hr Compliance periods	No. of 4 hr Compliance periods >0.3 NTU	No. of samples >0.3 NTU	Plant Tap	
					Number of Samples	Avg.	Max.	Avg.	Number of Samples	Avg.	Max.	Number of Samples	Avg.	Max.				Avg.	Max.
1	0.774	207	32.0	1.41	3	5.30	9.50	0.56	3	0.16	0.19	3	0.15	0.17	6	0	0	0.13	0.14
2	0.813	220	32.4	1.42	3	3.00	3.10	0.47	3	0.10	0.11	3	0.10	0.11	6	0	0	0.11	0.12
3	0.789	205	31.1	1.37	3	4.10	6.70	0.44	3	0.11	0.12	3	0.11	0.12	6	0	0	0.11	0.11
4	0.842	227	32.3	1.42	3	3.90	4.60	0.40	3	0.09	0.09	3	0.09	0.09	6	0	0	0.10	0.11
5	0.778	194	29.9	1.31	3	4.00	4.40	0.42	3	0.10	0.10	3	0.10	0.11	6	0	0	0.13	0.14
6	0.710	188	31.7	1.39	3	5.10	5.90	0.41	3	0.09	0.10	3	0.09	0.10	6	0	0	0.11	0.13
7	0.763	210	33.0	1.45	3	6.30	8.30	0.42	3	0.10	0.11	3	0.10	0.11	6	0	0	0.12	0.14
8	0.849	229	32.3	1.42	3	5.90	10.60	0.40	3	0.09	0.10	3	0.10	0.10	6	0	0	0.11	0.12
9	0.790	215	32.6	1.43	3	5.50	10.50	0.41	3	0.11	0.13	3	0.12	0.13	6	0	0	0.11	0.13
10	0.752	207	33.0	1.45	3	3.20	4.00	0.41	3	0.10	0.11	3	0.10	0.11	6	0	0	0.11	0.12
11	0.727	197	32.5	1.43	2	2.80	3.60	0.41	2	0.10	0.11	2	0.11	0.11	4	0	0	0.11	0.11
12	0.751	207	33.0	1.45	2	4.30	5.20	0.44	2	0.09	0.09	2	0.10	0.10	4	0	0	0.12	0.12
13	0.708	200	33.9	1.49	2	6.30	7.30	0.40	2	0.10	0.10	2	0.11	0.11	4	0	0	0.12	0.12
14	0.774	216	33.5	1.47	3	4.50	7.80	0.43	3	0.14	0.15	3	0.12	0.13	6	0	0	0.11	0.13
15	0.723	207	34.3	1.51	3	3.80	6.70	0.39	3	0.13	0.14	3	0.11	0.13	6	0	0	0.13	0.13
16	0.709	187	31.6	1.39	3	3.10	3.30	0.37	3	0.10	0.11	3	0.09	0.10	6	0	0	0.11	0.12
17	0.759	207	32.7	1.44	3	3.70	4.10	0.39	3	0.09	0.09	3	0.08	0.09	6	0	0	0.11	0.12
18	0.752	205	32.7	1.43	3	3.60	3.70	0.37	3	0.11	0.13	3	0.10	0.11	6	0	0	0.11	0.11
19	0.746	214	34.4	1.51	2	4.70	5.10	0.46	2	0.10	0.10	2	0.12	0.12	4	0	0	0.11	0.11
20	0.797	220	33.1	1.45	2	3.90	4.00	0.55	2	0.11	0.11	2	0.11	0.11	4	0	0	0.11	0.11
21	0.920	251	32.7	1.44	3	3.89	5.07	0.53	3	0.15	0.15	3	0.15	0.18	6	0	0	0.11	0.13
22	0.854	227	31.9	1.40	3	5.40	8.60	0.50				3	0.11	0.11	3	0	0	0.10	0.11
23	0.915	240	31.4	1.38	3	2.90	4.10	0.43	3	0.09	0.11	3	0.10	0.12	6	0	0	0.12	0.13
24	0.772	204	31.7	1.39	3	3.40	6.00	0.42	3	0.08	0.08	3	0.10	0.11	6	0	0	0.11	0.12
25	0.761	197	31.0	1.36	3	2.10	2.70	0.39	3	0.10	0.11	3	0.08	0.09	6	0	0	0.11	0.12
26	0.676	185	32.8	1.44	3	2.90	5.60	0.31				3	0.09	0.11	3	0	0	0.11	0.12
27	0.742	213	34.4	1.51	3	2.00	3.30	0.33				3	0.08	0.08	3	0	0	0.11	0.11
28	0.838	242	34.6	1.52	3	3.40	5.90	0.45				3	0.15	0.17	3	0	0	0.13	0.15
29	0.778	222	34.2	1.50	3	2.60	5.10	0.38	3	0.14	0.15	3	0.12	0.14	6	0	0	0.12	0.14
30	0.699	196	33.6	1.48	3	3.30	5.80	0.40	3	0.10	0.11	3	0.10	0.11	6	0	0	0.10	0.11

AVG	0.775			1.43	3	3.96		0.42		0.11			0.11					0.11	0.12
MAX	0.920			1.52	3	6.30	10.60	0.56		0.16	0.19		0.15	0.18				0.13	0.15
MIN	0.676			1.31	2	2.00		0.31		0.08			0.08					0.10	0.11
TOTAL	23.260	6339			85				73			85				0	0		

Date	pH		Total Hardness as CaCO ₃ mg/L		Total Alkalinity as CaCO ₃ mg/L		Non-Carb. Hardness as CaCO ₃ mg/L		Calcium as Ca ⁺⁺ mg/L		Magnesium as Mg ⁺⁺ mg/L		Chloride as Cl ⁻ mg/L		Conductivity umhos	Sulfate mg/L	CSMR
	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Tap	Tap	Tap
1	8.3	7.8	162	134	137	122	25	12	44	44	6	3		22	356	27	0.81
2	8.2	8.0	164	150	132	116	32	34	45	43	8	8	25	26	343	11	2.36
3	8.5	8.3	156	150	131	121	25	29	43	44	6	7		29	358	18	1.58
4	8.1	7.6	160	151	130	116	30	35	43	47	7	9		22	395	28	0.77
5	8.1	7.7	186	176	132	121	54	55	42	39	13	13		26	384	42	0.62
6	7.9	7.7	176	182	117	126	59	56	38	41	14	14		27	370	27	0.98
7	8.0	7.6	188	184	127	124	61	60	41	40	15	15		26	363	33	0.77
8	8.1	7.7	188	172	127	122	61	50	41	40	15	12		26	371	36	0.71
9	8.2	8.1	144	148	114	119	30	29	38	45	7	7	23	28	369	25	1.10
10	8.2	8.1	138	144	115	117	23	27	38	42	6	7		27	363	35	0.77
11	8.3	8.1	148	144	118	114	30	30	38	42	7	7		27	354	33	0.80
12	8.3	8.2	142	144	118	114	24	30	42	45	6	7		26	347	31	0.82
13	8.3	8.2	140	142	116	112	24	30	38	42	6	7		25	345	29	0.86
14	7.7	7.6	140	144	119	111	21	33	40	42	5	8		20	344	15	1.30
15	8.2	7.6	146	134	131	113	15	21	45	46	4	5		25	341	27	0.91
16	8.1	7.6	184	168	129	114	55	54	42	38	13	13		23	347	41	0.55
17	7.9	7.6	192	178	132	115	60	63	46	39	15	15		24	362	44	0.55
18	7.9	7.5	158	150	122	122	36	28	41	38	9	7		27	376	35	0.76
19	8.3	8.2	136	142	117	117	19	25	38	43	5	6		26	366	35	0.74
20	8.4	8.2	140	142	116	115	24	27	40	42	6	7	23	26	357	29	0.90
21	8.0	7.6	142	142	117	107	25	35	41	42	6	9	32	21	360	36	0.57
22	8.2	8.1	142	140	111	110	31	30	39	40	8	7		27	354	31	0.85
23	8.0	7.6	192	180	124	113	68	67	40	35	17	16		24	345	43	0.56
24	8.0	7.5	186	172	126	112	60	60	40	37	15	15		25	346	42	0.58
25	8.0	7.6	168	158	122	113	46	45	38	36	11	11		26	367	42	0.61
26	8.0	7.6	188	182	120	116	68	66	42	40	17	16		26	362	42	0.62
27	8.0	7.5	186	176	128	114	58	62	39	38	14	15		24	360	23	1.04
28	8.2	7.8	132	140	119	115	13	25	45	57	3	6	32	19	363	38	0.50
29	8.2	8.0	152	142	126	111	26	31	48	59	6	8		20	352	35	0.57
30	8.3	8.0	160	154	126	112	34	42	43	41	8	10		25	349	37	0.66

AVG	8.1	7.8	161	156	123	116	38	40	41	42	9	10	27	25	359	32	0.84
MAX	8.5	8.3	192	184	137	126	68	67	48	59	17	16	32	29	395	44	2.36
MIN	7.7	7.5	132	134	111	107	13	12	38	35	3	3	23	19	341	11	0.50

Date	Number of Samples	Colilert P/A	Heterotrophic Plate Count - CFU/mL		Temperature °C	
	Tap		Tap	Raw	Tap	Raw
1	1	A	26	0	14.0	15.0
2	1	A	12	0	14.0	14.0
3	1	A	33	0	14.0	14.0
4	1	A	37	2	14.0	15.0
5	1	A	30	0	14.0	14.5
6	1	A	38	0	13.7	14.5
7	1	A	17	0	13.2	14.5
8	1	A	93	0	13.2	14.5
9	1	A	36	0	14.0	15.0
10	1	A	48	0	14.0	15.0
11	1	A	23	0	13.0	14.0
12	1	A	3	7	13.0	14.0
13	1	A	14	0	12.0	14.0
14	1	A	61	0	13.0	14.0
15	1	A	16	0	11.0	13.0
16	1	A	25	0	11.0	12.5
17	1	A	13	0	10.0	12.5
18	1	A	18	1	9.2	12.0
19	1	A	27	5	11.0	12.0
20	1	A	10	0	9.0	12.0
21	1	A	43	2	8.0	11.0
22	1	A	44	9	8.0	10.0
23	1	A	31	0	7.5	9.0
24	1	A	37	0	7.7	8.5
25	1	A	18	0	8.2	8.5
26	1	A	11	0	8.3	8.5
27	1	A	15	0	8.5	8.5
28	1	A	9	0	9.0	9.0
29	1	A	10	0	9.0	9.0
30	1	A	13	0	9.0	10.0

AVG	1		27	1	11.1	12.3
MAX	1		93	9	14.0	15.0
MIN	1		3	0	7.5	8.5

Date	Free Chlorine Residual mg/L																	
	City Hall		Wolf Marine		Bait Shed		Sunny Spot		B&Z									
1																		
2	1.65		1.54		1.33		0.82		0.42									
3																		
4																		
5																		
6																		
7																		
8																		
9	1.23		1.21		1.38		0.97		0.64									
10																		
11																		
12																		
13																		
14																		
15																		
16	1.12		1.12		1.33		1.21		0.68									
17																		
18																		
19																		
20																		
21																		
22																		
23	1.73		1.67		2.05		1.09		0.83									
24																		
25																		
26																		
27																		
28																		
29																		
30	1.59		1.58		1.85		1.70		0.94									

DISTRIBUTION SAMPLES BACTERIOLOGICAL SUMMARY	AVG	MAX	MIN
Chlorine Residuals, mg/L	1.27	2.05	0.42
Total Number of routine distribution samples analyzed	25		
Total number of positive routine distribution samples	0		
Total number of routine distribution samples required	10		
Total number of check samples	0		
Total number of positive check samples			

CITY OF BENTON HARBOR
CT CALCULATIONS
November 2022

Date	Peak	Segment 2 - Flocculation (2)				Segment 3 - Sedimentation (2)			
	Low Service Flow	In Use	Residual	pH	Temp.	In Use	Residual	pH	Temp.
	gpm	%	mg/L		C	%	mg/L		C
11/1/2022	2562	100	1.57	7.7	14.0	100	1.57	7.7	14.0
11/2/2022	2549	100	1.71	8.1	13.9	100	1.71	8.1	13.9
11/3/2022	2501	100	1.67	8.3	14.2	100	1.67	8.3	14.2
11/4/2022	2445	100	1.73	7.6	14.3	100	1.73	7.6	14.3
11/5/2022	2519	100	1.53	7.8	14.9	100	1.53	7.8	14.9
11/6/2022	2398	100	1.59	7.9	15.2	100	1.59	7.9	15.2
11/7/2022	2484	100	1.91	7.8	14.8	100	1.91	7.8	14.8
11/8/2022	2489	100	1.84	7.8	14.4	100	1.84	7.8	14.4
11/9/2022	2891	100	1.98	8.1	13.8	100	1.98	8.1	13.8
11/10/2022	2383	100	1.95	8.1	13.6	100	1.95	8.1	13.6
11/11/2022	2434	100	1.74	8.2	13.0	100	1.74	8.2	13.0
11/12/2022	2492	100	1.92	8.2	13.4	100	1.92	8.2	13.4
11/13/2022	2571	100	1.64	8.2	13.1	100	1.64	8.2	13.1
11/14/2022	2282	100	1.55	7.7	13.0	100	1.55	7.7	13.0
11/15/2022	2368	100	1.51	7.7	12.0	100	1.51	7.7	12.0
11/16/2022	2706	100	1.53	7.8	11.6	100	1.53	7.8	11.6
11/17/2022	2538	100	1.51	7.6	11.2	100	1.51	7.6	11.2
11/18/2022	2429	100	1.38	7.6	10.5	100	1.38	7.6	10.5
11/19/2022	2474	100	1.72	8.2	9.8	100	1.72	8.2	9.8
11/20/2022	2465	100	1.68	8.2	9.0	100	1.68	8.2	9.0
11/21/2022	2540	100	1.94	7.8	8.0	100	1.94	7.8	8.0
11/22/2022	2475	100	1.88	8.1	7.9	100	1.88	8.1	7.9
11/23/2022	2511	100	1.47	7.7	10.9	100	1.47	7.7	10.9
11/24/2022	2398	100	1.73	7.8	7.9	100	1.73	7.8	7.9
11/25/2022	2395	100	1.74	7.7	8.0	100	1.74	7.7	8.0
11/26/2022	2266	100	1.65	7.8	7.8	100	1.65	7.8	7.8
11/27/2022	2311	100	1.43	7.8	9.0	100	1.43	7.8	9.0
11/28/2022	2353	100	1.78	8.0	9.0	100	1.78	8.0	9.0
11/29/2022	2467	100	1.80	7.8	9.0	100	1.80	7.8	9.0
11/30/2022	2444	100	1.61	8.2	8.8	100	1.61	8.2	8.8

CITY OF BENTON HARBOR
CT CALCULATIONS
November 2022

Date	Seg2 CT-M	Seg2 CT-R	Seg2 Ratio	Seg3 CT-M	Seg3 CT-R	Seg3 Ratio	Total Ratio	Total Inact.
	mg/L-min	mg/L-min	M/R	mg/L-min	mg/L-min	M/R	M/R	Log
11/1/2022	144	20	7	50	20	3	10	4.9
11/2/2022	158	23	7	54	23	2	9	4.6
11/3/2022	157	24	7	54	24	2	9	4.4
11/4/2022	167	19	9	57	19	3	12	5.9
11/5/2022	143	19	8	49	19	3	10	5.0
11/6/2022	156	19	8	54	19	3	11	5.4
11/7/2022	181	20	9	62	20	3	12	6.1
11/8/2022	174	20	9	60	20	3	12	5.8
11/9/2022	161	24	7	55	24	2	9	4.6
11/10/2022	193	24	8	66	24	3	11	5.4
11/11/2022	168	25	7	58	25	2	9	4.5
11/12/2022	182	25	7	62	25	2	10	4.9
11/13/2022	150	25	6	52	25	2	8	4.0
11/14/2022	160	21	8	55	21	3	10	5.1
11/15/2022	150	22	7	52	22	2	9	4.5
11/16/2022	133	24	6	46	24	2	7	3.7
11/17/2022	140	23	6	48	23	2	8	4.1
11/18/2022	134	24	6	46	24	2	8	3.8
11/19/2022	164	32	5	56	32	2	7	3.5
11/20/2022	161	33	5	55	33	2	6	3.2
11/21/2022	180	32	6	62	32	2	8	3.8
11/22/2022	179	35	5	61	35	2	7	3.4
11/23/2022	138	24	6	47	24	2	8	3.8
11/24/2022	170	32	5	58	32	2	7	3.6
11/25/2022	171	30	6	59	30	2	8	3.8
11/26/2022	172	32	5	59	32	2	7	3.7
11/27/2022	146	28	5	50	28	2	7	3.4
11/28/2022	178	31	6	61	31	2	8	3.8
11/29/2022	172	29	6	59	29	2	8	3.9
11/30/2022	155	34	5	53	34	2	6	3.1

Date	Filter Number											
	1	2	3	4	5	6	7	8	9	10	11	12
1					0.04	0.03	0.03	0.03				
2					0.03	0.03					0.06	0.09
3					0.04	0.03					0.04	0.04
4					0.03	0.03					0.03	0.03
5					0.03	0.03	0.03	0.03				
6					0.04	0.03					0.05	0.05
7					0.03	0.03					0.04	0.03
8					0.03	0.03					0.04	0.04
9					0.03	0.03					0.04	0.03
10					0.02	0.02					0.04	0.04
11					0.03	0.03					0.03	0.03
12					0.02	0.03					0.03	0.03
13					0.03	0.03					0.03	0.03
14					0.03	0.04	0.04	0.05				
15					0.03	0.03	0.03	0.03				
16					0.03	0.03	0.03	0.03			0.05	0.05
17					0.03	0.03					0.05	0.03
18					0.03	0.03					0.04	0.04
19					0.02	0.03					0.03	0.03
20					0.03	0.03					0.03	0.03
21					0.03	0.03					0.03	0.05
22							0.03	0.03			0.03	0.03
23					0.02	0.03					0.03	0.03
24					0.02	0.03					0.03	0.04
25					0.03	0.03					0.03	0.03
26							0.03	0.03			0.03	0.03
27							0.03	0.02			0.03	0.04
28							0.03	0.02			0.03	0.04
29					0.07	0.07	0.03	0.03				
30					0.03	0.03	0.03	0.02				
MAX					0.07	0.07	0.04	0.05	0	0	0.06	0.09

ENTRY POINT TO THE DISTRIBUTION SYSTEM WQP

Daily Excursions	Jan.	Feb.	Mar.	Apr.	May	Jun.	Total	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
pH	0	1	0	0	0	0	1	0	0	0	0	0		0
Ortho-phosphate	0	0	0	0	0	0	0	0	0	0	0	0		0
# Days with Excursions (9 days allowed per 6 months)	0	1	0	0	0	0	1	0	0	0	0	0		0

EPTDS WQP Range

pH minimum of 7.2 s.u.
Ortho-phosphate minimum of 3.0 mg/L as PO₄

DISTRIBUTION WQP 10 Samples Quarterly

Daily excursions	Jan.	Feb.	Mar.	Apr.	May	Jun.	Total	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
pH	0	0	0	0	0	0	0	0	0	0	0	0		0
Ortho-phosphate	1	0	0	0	0	0	1	0	0	0	0	0		0
# Days with Excursions (9 days allowed per 6 months)	1	0	0	0	0	0	1	0	0	0	0	0		0

Distribution WQP Range

pH minimum of 7.2 s.u.
Ortho-phosphate minimum of 3.0 mg/L as PO₄