

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

For the month/year of
January-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>5.057</u>	million gallons per day
2. Approved Rated Plant Capacity	<u>8</u>	million gallons per day
3. Average Filter Run	<u>111.0</u>	hours
4. Average Filtration Rate	<u>0.37</u>	gallons per square ft. per minute
5. Maximum Filtration Rate	<u>2.01</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>50148</u> lbs.	Est. Supply	<u>31</u> days
8. Alum (Al ³⁺) on hand	<u>51232</u> lbs.	Est. Supply	<u>175</u> days
9. Cost of All Chemicals	<u>396.19</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	<u>0</u>	<u>0</u>
Number of filter confluence samples collected	<u>93</u>	<u>93</u>
Percent of filter confluence samples >0.3 NTU	<u>0%</u>	<u>0%</u>
Number of filter confluence samples >1 NTU	<u>0</u>	<u>0</u>

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 31.283 **Average** 1.009 **Max** 1.235 **Min** 0.831

Comments

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	0.956	271	34.0	1.49	3	3.00	5.50	0.59	3	0.11	0.12	3	0.10	0.11	6	0	0	0.10	0.11
2	0.928	255	32.9	1.45	3	1.70	2.20	0.48	3	0.10	0.11	3	0.09	0.10	6	0	0	0.10	0.11
3	0.805	217	32.3	1.42	3	2.80	3.90	0.39	3	0.09	0.11	3	0.08	0.09	6	0	0	0.11	0.12
4	1.055	281	31.9	1.40	3	2.70	2.90	0.58	3	0.10	0.11	3	0.08	0.09	6	0	0	0.10	0.11
5	1.009	299	35.5	1.56	3	2.60	3.00	0.70	3	0.10	0.12	3	0.10	0.11	6	0	0	0.10	0.11
6	1.004	304	36.3	1.59	3	4.20	5.80	0.40	3	0.08	0.09	3	0.10	0.11	6	0	0	0.11	0.12
7	1.082	314	34.8	1.53	3	3.80	6.90	0.60	3	0.10	0.12	3	0.09	0.09	6	0	0	0.09	0.10
8	0.941	281	35.8	1.57	3	2.90	3.60	0.54	3	0.08	0.09	3	0.11	0.12	6	0	0	0.10	0.11
9	1.008	299	35.5	1.56	3	3.80	5.70	0.50	3	0.10	0.11	3	0.10	0.11	6	0	0	0.10	0.12
10	1.098	297	32.4	1.42	3	3.20	3.70	0.84	3	0.12	0.17	3	0.13	0.18	6	0	0	0.11	0.14
11	0.895	242	32.4	1.42	3	4.30	5.20	0.53	3	0.10	0.10	3	0.10	0.12	6	0	0	0.12	0.13
12	1.090	316	34.7	1.52	3	3.50	3.90	0.62	3	0.09	0.10	3	0.09	0.11	6	0	0	0.16	0.22
13	0.900	252	33.6	1.47	3	2.19	2.42	0.62	3	0.07	0.08	3	0.08	0.09	6	0	0	0.08	0.09
14	1.099	319	34.8	1.53	3	3.40	3.60	0.52	3	0.10	0.11	3	0.13	0.18	6	0	0	0.11	0.12
15	1.044	312	35.8	1.57	3	3.90	5.10	0.64	3	0.09	0.09	3	0.09	0.10	6	0	0	0.09	0.09
16	0.925	265	34.3	1.51	3	3.20	3.50	0.74	3			3	0.09	0.10	3	0	0	0.10	0.11
17	1.334	354	31.8	1.40	3	6.40	8.10	1.20	3	0.12	0.12	3	0.12	0.13	6	0	0	0.10	0.12
18	1.029	313	36.5	1.60	3	4.20	4.50	0.69	3	0.09	0.09	3	0.10	0.12	6	0	0	0.11	0.12
19	1.083	328	36.3	1.59	3	4.10	4.70	0.76	3	0.11	0.12	3	0.14	0.18	6	0	0	0.11	0.13
20	0.933	226	29.0	1.27	3	4.80	7.80	0.86	3	0.10	0.12	3	0.10	0.10	6	0	0	0.09	0.10
21	1.417	349	29.5	1.30	3	5.80	9.70	0.76	3	0.11	0.13	3	0.11	0.14	6	0	0	0.11	0.12
22	1.448	314	26.0	1.14	3	5.00	6.20	0.91	3	0.10	0.12	3	0.11	0.12	6	0	0	0.11	0.13
23	1.226	354	34.6	1.52	3	2.70	3.40	0.67	3	0.11	0.12	3	0.11	0.12	6	0	0	0.11	0.12
24	1.296	317	29.3	1.29	3	5.60	11.40	0.69	3	0.10	0.10	3	0.10	0.11	6	0	0	0.09	0.10
25	1.206	290	28.8	1.27	3	3.40	5.90	0.82	3	0.11	0.12	3	0.12	0.14	6	0	0	0.11	0.12
26	1.054	282	32.1	1.41	3	3.90	6.10	0.76	3	0.11	0.13	3	0.11	0.12	6	0	0	0.10	0.11
27	1.002	273	32.7	1.43	3	3.30	3.90	0.76	3	0.10	0.11	3	0.12	0.13	6	0	0	0.09	0.10
28	1.055	299	34.0	1.49	3	3.50	3.40	0.70	3	0.10	0.10	3	0.09	0.11	6	0	0	0.11	0.12
29	1.093	300	32.9	1.44	3	3.30	5.60	0.68	3	0.10	0.13	3	0.10	0.11	6	0	0	0.11	0.12
30	0.801	221	33.0	1.45	3	2.20	3.00	0.72	3	0.10	0.12	3	0.10	0.13	6	0	0	0.10	0.11
31	1.186	333	33.6	1.48	3	2.30	4.00	0.66	3	0.13	0.14	3	0.15	0.19	6	0	0	0.15	0.16
AVG	1.065			1.45	3	3.60		0.68		0.10			0.10					0.11	0.12
MAX	1.448			1.60	3	6.40	11.40	1.20		0.13	0.17		0.15	0.19				0.16	0.22
MIN	0.801			1.14	3	1.70		0.39		0.07			0.08					0.08	0.09
TOTAL	33.002	9077			93										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	8.0	7.8	212	196	143	134	69	62	49	46	17	15	21	26	421		
2	8.0	7.5	186	194	126	131	60	63	47	52	15	15			397		
3	8.0	7.7	228	218	135	132	93	86	59	57	23	21			410	37	
4	8.0	7.8	228	206	163	123	65	83	59	50	16	20			398		
5	8.1	8.0	202	178	166	141	36	37	66	57	9	9			358		
6	8.1	7.9	152	184	122	147	30	37	51	68	7	9			373		
7	8.0	7.9	168	172	129	131	39	41	55	55	9	10			344		
8	8.1	8.0	154	156	134	129	20	27	51	51	5	7			345		
9	8.1	8.0	152	158	122	127	30	31	46	53	7	8			348		
10	7.8	7.5	190	182	112	115	78	67	49	47	19	16			407	36	
11	8.0	7.6	208	190	113	110	95	79	53	49	23	19			320		
12	7.9	7.4	186	184	150	113	36	71	48	53	9	17			389	29	
13	7.9	7.4	148	149	117	115	31	34	47	46	8	8			380		
14	7.8	7.4	154	164	112	114	42	50	45	61	10	12	19	23	384	38	0.59
15	8.0	8.0	166	156	135	121	31	35	54	51	8	9		24	338	38	0.63
16	8.2	8.1	178	148	157	121	21	27	62	51	5	7		26	323	40	0.64
17	8.2	8.1	182	152	142	123	40	29	58	47	10	7	25	27	327	42	0.63
18	8.1	7.9	148	156	126	132	22	24	45	51	5	6		27	343	42	0.64
19	8.2	8.2	214	166	171	142	43	24	71	47	10	6		27	370	36	0.74
20	8.2	7.9	214	162	176	125	38	37	65	50	9	9		27	345	42	0.63
21	8.2	8.0	188	176	173	135	15	41	55	59	4	10		27	386	42	0.64
22	8.2	7.9	226	184	167	144	59	40	68	57	14	10		28	355	43	0.65
23	8.1	8.0	152	196	118	151	34	45	45	54	8	11		28	378	41	0.67
24	8.1	7.9	142	158	127	132	15	26	41	49	4	6	25	28	355	41	0.67
25	8.2	8.0	208	170	158	121	50	49	62	52	12	12		27	241	41	0.66
26	8.0	7.9	162	172	127	126	35	46	46	52	9	11	26	28	347	41	0.68
27	8.0	8.0	170	176	124	127	46	49	50	55	11	12		28	349	42	0.67
28	8.0	7.9	154	166	117	126	37	40	46	55	9	10		27	348	42	0.63
29	8.0	7.5	228	206	153	128	75	78	50	47	18	19	21	25	417	35	0.70
30	8.1	7.6	224	206	150	128	74	82	55	51	18	19		26	230	42	0.61
31	8.0	7.4	186	162	161	135	25	27	83	69	6	7	23	26	457	49	0.52

AVG	8.1	7.8	184	176	140	128	45	47	54	53	11	11	23	26	361	40	0.64
MAX	8.2	8.16	228	218	176	151	95	86	83	69	23	21	26	28	457	49	0.74
MIN	7.8	7.4	142	148	112	110	15	24	41	46	4	6	19	23	230	29	0.52

Date	Number of Samples	Colilert P/A	Heterotrophic Plate Count - CFU/mL		Temperature °C	
	Tap	Tap	Raw	Tap	Raw	Tap
1	1	A	107	0	6.2	7.0
2	1	A	66	0	6.2	7.0
3	1	A	45	0	5.5	7.5
4	1	A	38	0	4.7	7.0
5	1	A	63	0	7.0	7.0
6	1	A	34	0	6.0	7.0
7	1	A	24	0	5.0	7.0
8	1	A	42	1	4.0	6.0
9	1	A	19	0	4.0	6.0
10	1	A	15	0	4.2	5.0
11	1	A	19	0	3.7	5.0
12	1	A	33	0	3.0	4.5
13	1	A	49	2	4.0	5.0
14	1	A	42	0	3.5	4.0
15	1	A	40	0	3.0	5.0
16	1	A	19	0	3.0	5.0
17	1	A	50	0	3.0	5.0
18	1	A	14	0	3.0	4.0
19	1	A	45	0	4.0	5.0
20	1	A	23	0	4.0	5.0
21	1	A	55	0	3.0	4.0
22	1	A	70	0	3.0	4.0
23	1	A	27	0	3.0	4.0
24	1	A	32	0	3.0	4.0
25	1	A	36	0	3.0	3.0
26	1	A	22	0	3.0	4.0
27	1	A	37	0	3.0	3.0
28	1	A	23	0	3.0	3.0
29	1	A	37	0	2.7	2.5
30	1	A	15	0	2.5	3.0
31	1	A	20	0	3.0	3.3

AVG	1		37	0	3.8	4.9
MAX	1		107	2	7.0	7.5
MIN	1		14	0	2.5	2.5

Date	Free Chlorine Residual mg/L															
	City Hall	Wolf Marine	Bait Shed	Sunny Spot	B&Z											
1																
2																
3																
4																
5	1.64	1.49	1.35	1.34	0.94											
6																
7																
8																
9																
10																
11																
12	1.75	1.58	2.08	1.17	1.35											
13																
14																
15																
16																
17																
18																
19	1.42	1.32	0.98	0.97	1.12											
20																
21																
22																
23																
24																
25																
26	1.73	1.58	1.63	1.21	1.39											
27																
28																
29																
30																
31																

DISTRIBUTION SAMPLES BACTERIOLOGICAL SUMMARY	AVG	MAX	MIN
Chlorine Residuals, mg/L	1.40	2.08	0.94
Total Number of routine distribution samples analyzed	20		
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			

DATE	Peak HS Flow GPM	Minimum Reservoir Depth Feet	In Use %	Minimum Chlorine Residual mg/L	pH	Temperature °C	CT	CTR	M/R	Inactivation log
1	1791	8.8	100%	1.10	7.8	7.0	404.3	31.3	12.9	6.4
2	3536	9.6	100%	0.98	7.5	7.0	199.0	27.7	7.2	3.6
3	3580	9.3	100%	1.05	7.7	7.5	204.0	29.0	7.0	3.5
4	3404	7.9	100%	1.20	7.8	7.0	208.3	31.8	6.6	3.3
5	1793	8.5	100%	1.33	8.0	7.0	471.6	34.5	13.7	6.8
6	1815	8.9	100%	1.22	7.9	7.0	447.5	32.9	13.6	6.8
7	5552	8.7	100%	1.38	7.9	7.0	161.8	33.6	4.8	2.4
8	1817	8.6	100%	1.45	8.0	6.0	513.3	37.5	13.7	6.8
9	1836	8.7	100%	1.49	8.0	6.0	528.1	37.6	14.0	7.0
10	1862	7.8	100%	1.50	7.5	5.0	470.0	33.9	13.8	6.9
11	1788	8.6	100%	1.61	7.6	5.0	579.2	35.6	16.3	8.1
12	1791	8.1	100%	1.48	7.4	4.5	500.7	33.8	14.8	7.4
13	1789	8.5	100%	1.43	7.4	5.0	508.2	32.9	15.5	7.7
14	1836	7.7	100%	1.36	7.4	4.0	426.6	34.6	12.3	6.2
15	1796	8.4	100%	1.51	8.0	5.0	528.3	40.4	13.1	6.5
16	3490	8.0	100%	1.53	8.1	5.0	262.3	41.9	6.3	3.1
17	1867	6.8	100%	1.42	8.1	5.0	386.9	41.4	9.3	4.7
18	1778	7.9	100%	1.36	7.9	4.0	452.0	41.2	11.0	5.5
19	1828	8.5	100%	1.42	8.2	5.0	493.9	42.2	11.7	5.8
20	1779	8.3	100%	1.25	7.9	5.0	436.2	38.0	11.5	5.7
21	1828	7.4	100%	1.20	8.0	4.0	363.4	41.9	8.7	4.3
22	1827	7.7	100%	1.32	7.9	4.0	416.1	41.0	10.1	5.1
23	1850	8.7	100%	1.27	8.0	4.0	446.7	42.2	10.6	5.3
24	1816	8.2	100%	1.48	7.9	4.0	499.9	41.8	12.0	6.0
25	1810	9.2	100%	1.64	8.0	3.0	623.5	47.0	13.3	6.6
26	1846	9.1	100%	1.60	7.9	4.0	590.0	42.2	14.0	7.0
27	1881	9.0	100%	1.62	8.0	3.0	579.8	46.9	12.4	6.2
28	3048	9.2	100%	1.64	7.9	3.0	370.3	45.4	8.1	4.1
29	1861	8.2	100%	1.57	7.5	2.5	517.5	40.6	12.7	6.4
30	1824	9.6	100%	1.55	7.6	3.0	610.2	40.6	15.0	7.5
31	1891	7.7	100%	1.52	7.4	3.3	463.0	36.9	12.5	6.3

AVG	2200.3226	8.4	100%			4.9	440.7	38.0	11.6	5.8
MAX	5552	9.6	100%			7.5	623.5	47.0	16.3	8.1
MIN	1778	6.8	100%			2.5	161.8	27.7	4.8	2.4

WORST CASE SCENARIO:	Peak Flow, Minimum Clearwell Depth, Minimum Tap Chlorine Residual
DATE:	1/7/2022
ACTUAL C*T:	161.8
REQUIRED C*T:	33.6

Date	Filter Number											
	1	2	3	4	5	6	7	8	9	10	11	12
1					0.05	0.06	0.05	0.03				
2					0.05	0.05	0.06	0.03				
3					0.03	0.04	0.05	0.03				
4					0.04	0.05	0.07	0.03				
5					0.04	0.06	0.06	0.04			0.06	0.16
6					0.03	0.04	0.05	0.03			0.04	0.11
7					0.03	0.05	0.05	0.03			0.03	0.09
8					0.03	0.15	0.08	0.08				
9					0.03	0.03	0.05	0.04			0.04	0.12
10					0.10	0.10					0.13	0.19
11					0.04	0.04					0.13	0.12
12					0.03	0.03	0.04	0.04			0.04	0.10
13					0.06	0.04	0.05	0.06			0.06	0.10
14					0.02	0.02					0.03	0.08
15					0.02	0.02					0.03	0.08
16							0.04	0.04			0.03	0.09
17					0.05	0.05	0.04	0.04			0.03	0.09
18					0.03	0.03	0.04	0.03			0.03	0.08
19					0.04	0.03	0.04	0.04			0.03	0.08
20					0.05	0.04	0.04	0.04			0.02	0.08
21					0.05	0.03	0.06	0.04			0.03	0.09
22					0.05	0.04	0.06	0.04			0.08	0.16
23					0.06	0.04	0.05	0.04				
24					0.05	0.03	0.05	0.04				
25					0.06	0.04	0.10	0.03				
26					0.04	0.04	0.05	0.05				
27					0.04	0.04	0.04	0.03				
28					0.06	0.04	0.04	0.05			0.03	0.09
29					0.05	0.05	0.10	0.10			0.03	0.09
30					0.05	0.04					0.06	0.09
31							0.05	0.04			0.04	0.10
MAX					0.10	0.15	0.10	0.10			0.13	0.19

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						0							0
Ortho-phosphate	0						0							0
# Days with Excursions (9 days allowed per 6 months)	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
Ortho-phosphate	1						1							0
# Days with Excursions (9 days allowed per 6 months)	1						1							0

Distribution WQP Range

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