

**MONTHLY OPERATION REPORT OF
THE CITY OF BENTON HARBOR WATER TREATMENT PLANT**

SUPPLY NAME:

CITY OF BENTON HARBOR

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WSSN:0600

Operator-in-Charge

Abul D Ahmed

Month/Year

December 2021

F1

Signature of Operator-in-Charge

Water Plant Classification

F-1

Berrien

County

Treatment Rate and Filter Data

Maximum Treatment Rate:	1.3268	Million Gallons per Day
Rated Plant Capacity:	8	Million Gallons per Day
Average Filter Run:	140.50	Hours
Average Head Loss:	NA	Feet
Average Filtration Rate:	1.56	Gallons Per Square Feet per Minute
Maximum Filtration Rate:	2.48	Gallons Per Square Feet per Minute
Average Wash Water Use:	0.64%	Percent of Treated Water

Chemical Data

Chlorine on hand:	47914	lb.	Est. supply:	141	days
Primary Coagulant (Alum (Al3+)) on hand:	37729	lb.	Est. supply:	149	days
Cost of All Chemicals per Million Gallons:	\$68.21	dollars			
Total Power Cost per Million Gallons:		dollars			

Remarks

Number of filter confluence samples > 0.3 NTU:
 Number of filter confluence samples collected:
 Percent of filter confluence samples > 0.3 NTU:
 Number of filter confluence samples > 1 NTU

	North Filter	South Filter
Number of filter confluence samples > 0.3 NTU	0	0
Number of filter confluence samples collected	93	93
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.
- Was continuous (every 15 minutes) filter monitoring equipment off-line during the month? NO
If yes, indicate date(s), duration, and individual filter grab sampling frequency on a separate sheet.
- Did POE 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.

HS Flow Meter	Total	29.4929	Avg	0.9514	Max	1.2120	Min	0.8260

Remarks:

D	MIL.	Dry as Al ₂ (SO ₃) ₄ Pounds Add	ALUM as Al ₃ ⁺ mg/l	TURBIDITY UNITS			# Samples	FILTERED NORTH		# Samples	FILTERED SOUTH		2 Hour Compliance Periods		
	GAL.			RAW		Applied		Avg.	Max.		Avg.	Max.	Avg.	Max.	# of Periods
A	TREAT.			Avg.	Max.	Avg.		Avg.	Max.		Avg.	Max.		North	South
T															
E															
1	1.0900	335.00	1.62	4.00	5.40	0.73	3	0.00	0.00	3	0.10	0.12	6	0	0
2	1.0500	326.00	1.63	4.00	5.50	0.74	3	0.00	0.00	3	0.10	0.13	6	0	0
3	1.0650	326.00	1.61	4.90	7.90	0.79	3	0.00	0.00	3	0.10	0.12	6	0	0
4	0.9125	263.00	1.52	3.40	5.70	0.58	3	0.11	0.13	3	0.10	0.11	6	0	0
5	0.7900	236.00	1.57	3.70	7.30	0.42	3	0.11	0.11	3	0.08	0.09	6	0	0
6	1.0675	319.00	1.16	4.60	5.50	0.56	3	0.10	0.12	3	0.10	0.11	6	0	0
7	1.0675	323.00	1.59	4.00	5.10	0.61	3	0.08	0.10	3	0.10	0.13	6	0	0
8	1.0575	332.00	1.65	4.90	7.40	0.92	3	0.00	0.00	3	0.11	0.12	6	0	0
9	0.9831	294.00	1.57	3.24	4.11	0.70	3	0.07	0.08	3	0.07	0.08	6	0	0
10	1.0587	323.00	1.61	7.00	4.00	0.73	3	0.12	0.13	3	0.11	0.11	6	0	0
11	1.0877	321.00	1.55	5.00	6.70	0.78	3	0.10	0.11	3	0.10	0.11	6	0	0
12	1.1349	345.00	1.60	4.00	4.40	0.68	3	0.09	0.12	3	0.09	0.10	6	0	0
13	0.9354	288.00	1.62	6.90	9.78	0.97	3	0.08	0.09	3	0.11	0.18	6	0	0
14	1.0575	309.00	1.54	4.80	8.60	1.90	3	0.11	0.12	3	0.09	0.10	6	0	0
15	0.9810	298.00	1.60	4.00	4.50	1.00	3	0.10	0.11	3	0.09	0.11	6	0	0
16	1.0207	302.00	1.56	4.50	5.00	1.10	3	0.11	0.11	3	0.10	0.12	6	0	0
17	1.1549	272.00	1.24	5.60	11.40	0.84	3	0.12	0.13	3	0.09	0.10	6	0	0
18	1.0000	299.00	1.57	2.00	3.10	0.49	3	0.10	0.10	3	0.10	0.12	6	0	0
19	0.8325	257.00	1.62	3.60	6.50	0.59	3	0.08	0.10	3	0.09	0.11	6	0	0
20	1.0850	344.00	1.67	3.30	3.80	0.63	3	0.09	0.11	3	0.10	0.12	6	0	0
21	1.3268	690.00	2.74	4.00	4.90	1.01	3	0.09	0.09	3	0.10	0.11	6	0	0
22	1.0639	658.00	3.25	2.70	4.70	0.46	3	0.10	0.12	3	0.09	0.10	6	0	0
23	1.1117	479.00	2.27	3.00	4.80	0.32	3	0.08	0.09	3	0.10	0.13	6	0	0
24	0.8579	131.00	0.80	1.70	2.20	0.90	3	0.08	0.08	3	0.10	0.12	6	0	0
25	0.9573	176.00	0.97	3.00	5.90	0.80	3	0.10	0.12	3	0.10	0.12	6	0	0
26	0.7675	208.00	0.97	1.70	2.10	0.44	3	0.10	0.12	3	0.10	0.11	6	0	0
27	0.9805	269.00	1.44	3.30	6.60	0.41	3	0.09	0.10	3	0.09	0.10	6	0	0
28	0.9076	258.00	1.50	2.57	4.18	0.44	3	0.11	0.12	3	0.11	0.13	6	0	0
29	1.0579	316.00	1.57	1.93	3.10	0.49	3	0.09	0.12	3	0.11	0.13	6	0	0
30	1.0105	318.00	1.66	2.10	3.80	0.43	3	0.10	0.11	3	0.10	0.11	6	0	0
31	1.0941	331.00	1.59	3.60	6.60	0.41	3	0.10	0.09	3	0.11	0.11	6	0	0
Total	31.5671	9946.00	49.86	117.04	170.57	21.84	93	3	3	93	3	4	186	0	0
Avg.	1.0183	320.84	1.61	3.78	5.50	0.70		0.08	0.09		0.10	0.11	6	0	0
Max	1.3268	690.00	3.25	7.00	11.40	1.90		0.12	0.13		0.11	0.18	6	0	0
Min.	0.7675	131.00	0.80	1.70	2.10	0.32		0.00	0.00		0.07	0.08	6	0	0

CHEMICAL ANALYSES

			Total		Total		Non-Carb.								WQP	
	pH		Hardness		Alkalinity		Hardness		Calcium		Magnesium		Chloride		Conductivity	Sulfate
D			as CaCO3 mg/l		as CaCO3 mg/l		as CaCO3 mg/l		as Ca++mg/l		as Mg++mg/l		as Cl- mg/l		umhos	mg/l
A																
T	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Raw	Tap	Tap	Tap
E	29.	30.	31.	32.	33.	34.	35	36	37	38	39	40	41	42		
1	8.2	8.0	166	160	143	134	23	26	50	49	10	9			364.0	
2	8.1	8.0	164	162	134	131	30	31	51	46	9	11			368.0	
3	8.2	8.2	172	162	141	129	31	33	52	50	10	9			366.0	
4	8.0	7.8	192	186	130	129	62	57	46	44	19	18	20.0	25.0	337.0	
5	8.1	7.8	192	188	127	114	65	74	46	46	19	18			376.0	
6	7.9	7.7	182	178	136	124	46	54	39	42	21	17			367.0	39.0
7	8.0	7.7	206	186	131	121	75	65	51	46	19	17			376.0	
8	8.0	8.0	184	158	149	123	35	35	59	49	9	9			324.0	
9	8.3	7.6	161	159	132	128	29	31	41	51	14	8			394.0	
10	8.1	8.0	156	162	130	137	26	25	47	51	9	9			378.0	
11	8.2	8.1	162	168	131	133	31	35	55	55	6	6			316.0	
12	8.2	8.1	150	162	121	131	29	31	42	49	11	10			324.0	
13	7.5	7.5	148	155	138	110	10	45	59	49	14	12			351.0	40.0
14	8.0	7.4	216	194	139	129	77	65	48	46	23	19			366.0	
15	8.0	7.7	216	196	151	130	65	66	54	51	20	17			392.0	
16	8.0	7.5	194	206	136	131	58	75	43	51	21	19			426.0	
17	8.0	7.4	188	180	127	138	61	42	47	51	15	13			416.0	
18	8.0	7.9	148	166	121	132	27	34	39	45	12	13			378.0	
19	8.0	7.8	150	162	123	128	27	34	46	55	8	6			349.0	
20	8.0	8.0	148	156	129	126	19	30	49	55	6	4	21.5	24.0	318.0	43.0
21	8.2	7.9	170	156	144	124	26	32	51	47	11	9			344.0	
22	7.9	7.4	186	188	123	125	63	63	48	49	16	16			411.0	
23	8.0	7.3	182	168	113	120	69	48	44	50	18	11			395.0	
24	8.0	7.6	202	186	139	110	63	76	49	51	19	14			404.0	
25	8.1	7.9	192	180	133	119	59	61	47	49	18	14	19.0	23.5	405.0	
26	8.0	7.9	184	196	114	124	70	72	43	47	18	13				
27	8.1	8.0	162	170	129	133	33	37	47	54	11	9	23.0	26.0	343.0	41.0
28	7.9	7.5	178	176	150	131	28	45	55	77	14	19			420.0	37.0
29	8.1	8.0	182	166	149	128	33	38	60	58	8	5				
30	8.0	8.0	180	172	144	133	36	39	55	57	10	7			345.0	
31	8.1	8.0	186	178	156	141	30	37	61	58	8	8			373.0	
Avg.	8.0	7.8	177.1	173.5	133.6	126.8	43.5	46.6	48.8	50.7	13.9	12.0	20.9	24.6	369.9	40.0
Max	8.3	8.2	216.0	206.0	151.0	138.0	77.0	76.0	60.0	77.0	23.0	19.0	23.0	26.0	426.0	43.0
Min.	7.5	7.3	148.0	155.0	113.0	110.0	10.0	25.0	39.0	42.0	6.0	22.0	19.0	23.5	316.0	37.0

WSSN 0600 MONTH/YEAR December 2021

FLUORIDATION AND CHLORINATION

D A T E	Fluoride Analysis				Chlorine Application								TAP RESIDUAL		
	Applied as Fmg/l	Raw	Tap	mg/l Dist.	INTAKE		Pre Treat Raw Line		FILTERED		Total NaOCl Use		Free from SCADA historian lowest value		
					PPD	applied mg/l	PPD	applied mg/l	PPD	applied mg/l	PPD	applied mg/l	Demand mg/L	Free mg/l	Total mg/l
1	0.19		0.77	0.27	0	0.00	333	4.56	44	0.60	377	4.28	1.97	1.53	2.31
2	0.20		0.75		0	0.00	322	4.58	52	0.74	374	4.25	1.82	1.55	2.43
3	0.17		0.76		0	0.00	317	4.44	34	0.48	351	4.04	1.78	1.67	2.26
4	0.69		0.74		0	0.00	260	4.25	21	0.34	281	3.35	1.43	1.64	1.92
5	0.27		0.71		0	0.00	196	3.70	51	0.96	247	2.87	-0.25	1.61	3.12
6	0.22		0.72		0	0.00	265	3.71	38	0.53	303	3.08	1.07	1.64	2.01
7	0.13		0.58		0	0.00	255	3.57	88	1.23	343	3.90	0.45	1.68	3.45
8	0.79		0.49	0.40	0	0.00	249	3.51	80	1.13	329	3.78	0.86	1.53	2.92
9	0.14		0.56		0	0.00	232	3.52	67	1.02	299	3.17	0.26	1.43	2.91
10	0.12		0.64		0	0.00	248	3.50	84	1.18	332	3.77	0.76	1.35	3.01
11	0.12		0.66		0	0.00	214	2.94	80	1.10	294	3.46	0.85	1.46	2.61
12	0.14		0.72		0	0.00	214	2.81	74	0.97	288	3.31	0.58	1.35	2.73
13	0.21	0.20	0.35		0	0.00	180	2.87	51	0.81	231	2.69	0.25	1.33	2.44
14	0.20		0.66		0	0.00	234	3.30	70	0.99	304	3.23	0.09	1.49	3.14
15	0.19	0.30	0.59	0.61	0	0.00	207	3.15	47	0.72	254	2.99	0.41	1.33	2.58
16	0.14		0.52		0	0.00	221	3.23	50	0.73	271	3.08	1.08	1.16	2.00
17	0.55		0.44		0	0.00	179	2.31	40	0.52	219	2.82	0.43	1.15	2.39
18	0.12		0.63		0	0.00	212	3.16	38	0.57	250	2.84	0.41	1.18	2.43
19	0.12		0.63		0	0.00	184	3.30	50	0.90	234	2.93	0.01	1.33	2.92
20	0.17	0.36	0.64		0	0.00	242	3.33	62	0.85	304	3.38	0.35	1.36	3.03
21	0.58		0.44		0	0.00	256	2.88	69	0.78	325	3.69	0.46	1.33	3.23
22	0.30	0.47	0.64	0.62	0	0.00	248	3.48	68	0.95	316	3.96	-0.09	1.26	4.05
23	0.12		0.48		0	0.00	256	3.44	62	0.83	318	3.53	1.47	1.25	2.06
24	0.24		0.67		0	0.00	173	3.01	33	0.57	206	2.43	-0.01	1.59	2.44
25	0.21		0.86		0	0.00	198	3.09	33	0.51	231	2.75	0.78	1.26	1.97
26	0.29		0.73		0	0.00	157	3.05	25	0.49	182	2.22	0.27	1.18	1.95
27	0.18	0.16	0.65		0	0.00	193	2.94	38	0.58	231	2.69	0.61	1.15	2.08
28	0.14	0.23	0.59		0	0.00	190	3.13	38	0.63	228	2.75	0.45	1.13	2.30
29	0.13		0.64	0.69	0	0.00	208	2.94	38	0.54	246	2.80	0.70	1.22	2.10
30	0.10		0.68		0	0.00	206	3.04	41	0.61	247	2.81	0.66	1.16	2.15
31	0.13		0.62		0	0.00	218	2.97	44	0.60	262	2.88	0.78	1.09	2.10
Avg.	0.24	0.29	0.63	0.52	0.00	0.00	228.30	3.36	52.20	0.76	280.50	3.23	0.66	1.38	2.56
Max	0.79	0.47	0.86	0.69	0.00	0.00	333.00	4.58	88.00	1.23	377.00	4.28	1.97	1.68	4.05
Min.	0.10	0.16	0.35	0.27	0.00	0.00	157.00	2.31	Yes	0.34	182.00	2.22	-0.25	1.13	1.92

MONTH/YEAR

December 2021

BACTERIOLOGICAL AND PHYSICAL PARAMETERS

D A T E	PLANT TAP		Standard Plate Count		Raw	Tap
	No. of Samples	Colilert P/A	Raw	Tap	TEMP. °C	TEMP. °C
1	1	A	44	0	8	9.0
2	1	A	19	0	8	9.0
3	1	A	23	0	8	9.0
4	1	A	51	0	8	8.5
5	1	A	29	0	9	8.5
6	1	A	22	0	9	9.0
7	1	A	18	0	8	9.0
8	1	A	23	0	8	9.0
9	1	A	29	0	7	9.0
10	1	A	13	0	7	8.0
11	1	A	57	0	7	9.0
12	1	A	15	0	8	9.0
13	1	A	129	0	6	7.0
14	1	A	183	0	6	7.0
15	1	A	201	0	7	7.5
16	1	A	75	0	8	7.0
17	1	A	104	0	8	8.0
18	1	A	53	0	8	9.0
19	1	A	24	0	8	9.0
20	1	A	110	0	7	8.0
21	1	A	112	0	7	8.0
22	1	A	17	4	8	7.5
23	1	A	83	0	6	8.0
24	1	A	90	0	6	8.0
25	1	A	34	0	7	7.5
26	1	A	24	0	7	7.0
27	1	A	55	0	7	8.0
28	1	A	45	0	8	8.3
29	1	A	49	0	7	9.0
30	1	A	29	0	7	8.0
31	1	A	21	0	7	8.0
AVG.	1	A	58	0	7	8
Max			201	4	9	9
Min			13	0	6	7

Yes

MONTH/YEAR December 2021

Distribution Flow and Corrosion Treatment

D A T E	Ortho P System					Distribution Flow and Corrosion Treatment			
	City Hall	Wolfs	Bait Shed	Sunny Spot	B&Z	High Service		PO4	Tap Ortho P
	Ortho P	Ortho P	Ortho P	Ortho P	Ortho P	Meter	Lbs PO4	Applied	Residual
	Residual mg/L	Residual mg/L	Residual mg/L	Residual mg/L	Residual mg/L	MGD		mg/L	mg/L
1	4.66	4.02	3.50	3.68	3.64	1.0290	119.0	4.58	3.82
2						1.0290	138.0	5.31	3.92
3						0.9960	121.0	4.81	4.56
4						0.9480	115.0	4.80	4.52
5						0.9510	116.0	4.83	4.26
6						0.8500	91.0	4.24	4.30
7						1.0290	118.0	4.54	4.12
8	4.06	3.92	4.46	3.78	3.74	0.9770	88.0	3.56	4.38
9						0.9220	89.0	3.82	4.14
10						1.0090	99.0	3.88	4.20
11						0.9960	91.0	3.62	4.68
12						1.2120	127.0	4.15	4.74
13						0.9730	123.0	5.00	5.12
14						0.9210	105.0	4.51	4.24
15	3.52	3.42	3.18	4.32	3.40	1.0070	108.0	4.24	3.86
16						0.9020	112.0	4.91	3.90
17						0.9580	99.0	4.09	5.96
18						0.8260	111.0	5.32	4.66
19						0.9600	106.0	4.37	3.88
20						0.8640	122.0	5.59	3.80
21						1.0090	110.0	4.31	3.94
22	3.74	3.64	3.50	3.90	3.46	0.9640	119.0	4.88	3.42
23						0.9800	98.0	3.96	3.10
24						0.8440	182.0	8.53	2.48
25						0.9010	100.0	4.39	3.70
26						0.8360	102.0	4.83	3.24
27						0.8510	114.0	5.30	4.78
28						0.9730	128.0	5.21	3.22
29	3.24	3.18	3.12	3.82	3.34	0.9400	116.0	4.88	3.46
30						1.0020	108.0	4.26	3.30
31						0.8339	112.0	5.31	3.34
Totals						29.4929	3487.0		
AVG.	3.64	3.54	3.57	3.96	3.49	0.9514	112.5	4.71	4.04
Max	4.06	3.92	4.46	4.32	3.74	1.2120	182.0	8.53	5.96
Min	3.24	3.18	3.12	3.78	3.34	0.8260	88.0	3.56	2.48

CITY OF BENTON HARBOR

DISTRIBUTION SYSTEM MONITORING WSSN 0600 December 2021

Chlorine Residual at Bacteriological Monitoring Stations, mg/l

DATE	Free Chlorine Residual at Bacteriological Monitoring Stations mg/l					6	7			
	City Hall	Wolf Marine	Bait Shed	Sunny Spot	B & Z					
1	1.03	1.35	1.62	0.87	0.96					
2										
3										
4										
5										
6										
7										
8	1.82	1.70	1.84	1.22	1.46					
9										
10										
11										
12										
13										
14										
15	2.06	1.54	1.73	1.21	1.45					
16										
17										
18										
19										
20										
21										
22	1.40	1.77	1.08	1.28	1.32					
23										
24										
25										
26										
27										
28										
29	1.24	1.37	1.09	1.09	0.56					
30										
31										

DISTRIBUTION SAMPLES -- BACTERIOLOGICAL SUMMARY

Total number of routine distribution samples analyzed
 Total number of positive routine distribution samples
 Total number of routine distribution samples required
 Average Free Chlorine Residuals, mg/L
 Total number of check samples
 Total number of positive check samples

25		
0		
10	Max	Min
1.36	2.06	0.56
0	Yes	
0		