UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO ATTENTION OF
ECW-15J

VIA EMAIL

Ellis Mitchell
City Manager
City of Benton Harbor
200 East Wall Street
Benton Harbor, MI 49022
emitchell@bhcity.us

Re: EPA Inspection of the City of Benton Harbor public water system (PWS ID# MI0000600) in Berrien County, Michigan

Dear Mr. Ellis:

On February 14, 2022, the U.S. Environmental Protection Agency ("EPA") conducted a compliance evaluation inspection of the City of Benton Harbor public water system (PWS ID# MI0000600) located in Berrien County, Michigan. The purpose of the inspection was to make observations about the site conditions, operation, and monitoring of the System to evaluate compliance with the Safe Drinking Water Act ("SDWA"), regulatory requirements, and specifically, the November 2, 2021 Unilateral Administrative Order. Enclosed please find a copy of our inspection report. EPA appreciates the opportunity to work with you to provide drinking water that meets or exceeds national drinking water standards.

Should you find anything in the report that you disagree with, or you wish to provide an update, please provide a detailed response within 30 days after receipt of the inspection report. If you have questions or concerns regarding this letter or believe any part of the report is not accurate, please contact either of staff, Victoria Anderson, at (312) 353-4367 or by e-mail at anderson.victoria@epa.gov or Taylor Girouard, at (312) 353-1394 or by e-mail at girouard.taylor@epa.gov.

Sincerely,

Elizabeth Murphy

Digitally signed by Elizabeth Murphy
Date: 2022.03.29 08:05:00 -05'00'

Elizabeth Murphy
Supervisor
Water Enforcement and Compliance Assurance Branch, Section 3

cc w/enclosures (via email):
Victoria Anderson, EPA
Taylor Girouard, EPA
Matt Russo, EPA
Jacqueline Clark, EPA
Tom Mendez, EPA
Ernie Sarkipato, EGLE

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REPLY TO ATTENTION OF
ECW-15J

Region 5 Enforcement and Compliance Assurance Division
SDWA DRINKING WATER INSPECTION REPORT

City of Benton Harbor

Berrien County, Michigan

Inspection Date(s):	February 14, 2022		
Owner/Company Name:	City of Benton Harbor		
System Name	Benton Harbor PWS		
System Location	601 Ridgeway Street		
City, State, Zip Code	St. Joseph, Michigan 49085		
County	Berrien		
Mailing Address:	200 East Wall Street		
City, State, Zip Code	Benton Harbor, Michigan 49022		
System Contact	Ellis Mitchell, City Manager		
	(269) 927-8457		
PWS ID No:	MI0000600		
Personnel Participating in Inspection:			
Victoria Anderson	Life Scientist, EPA Lead Inspector	anderson.victoria@epa.gov	(312) 353-4367
Taylor Girouard	Physical Scientist, EPA	girouard.taylor@epa.gov	(312) 353-1394
Sasha Letuchy	Environmental Engineer, EPA	letuchy.alexandra@epa.gov	(312) 886-6035
Abul Ahmed	Project Manager, F&V Operations & Resource Management, Inc. (F&V)	aahmed@fv-operations.com	(586) 668-6169
Blair Selover	Group Manager, F&V	bselover@fv-operations.com	(810) 252-8884
Rob Jones	F&V	rjones@fv-operations.com	(810) 220-9441
Darold Harlan	Project Manager, F&V	dharlan@fv-operations.com	(260) 224-5578
Ernie Sarkipato	Engineer, EGLE	sarkipatoe@michigan.gov	(616) 327-0261
EPA Lead Inspector Signature/Date	VICTORIA ANDERSON Digitally signed by VICTORIA ANDERSON Date: 2022.03.24 12:08:51 -05'00'		
Section Chief Signature/Date	Elizabeth Murphy Digitally signed by Elizabeth Murphy Date: 2022.03.29 08:05:23 -05'00'		

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1 INTRODUCTION

1.1 Purpose of the Inspection

On February 14, 2022, EPA Region 5 conducted an inspection at the City of Benton Harbor drinking water system ("System") in Berrien County, Michigan. The scope of the inspection was an onsite review of the water source, facilities, equipment, operation, maintenance, and monitoring compliance of a public water supply ("PWS") to evaluate the adequacy of the PWS, its sources and operations, and the distribution of safe drinking water. This inspection specifically looked at current compliance status with EPA's Unilateral Administrative Order ("UAO"), effective November 2, 2021.

A written Notice of Inspection was sent to the Michigan Department of Environment, Great Lakes, and Energy ("EGLE") and the System on January 27, 2022.

1.2 System Description

The System is a community water system ("CWS") serving approximately 9,800 full-time residents in southwest Michigan. The System is owned by the City of Benton Harbor and operated by a contractor, F&V Operations and Resource Management, Inc. ("F&V"). The source water is Lake Michigan, and raw water is provided through a single intake location. The treatment system is a conventional filtration treatment process including coagulation, flocculation, sedimentation, and filtration. Chemical additions include alum, aqueous chlorine mixture for free chlorine disinfection, fluoride, and a blended phosphate for corrosion control. The average daily demand is between 1.1 and 1.3 millions of gallons per day ("MGD").

2 INSPECTION SUMMARY

2.1 Opening Conference

The inspection opening conference began at 8:10 AM EST on February 14, 2022, at the Benton Harbor drinking water treatment plant. Victoria Anderson, Taylor Girouard, and Sasha Letuchy, all of EPA Region 5, presented their credentials to all personnel present during the opening conference (See Appendix B). Ernie Sarkipato of EGLE was present for the inspection. Ms. Anderson stated the purpose of the inspection and the general schedule.

Following the opening statements, EPA reminded the System of its upcoming deadlines pursuant to the UAO and asked if there were any questions. The System stated it was on track to meet the deadlines and did not have any further questions. EPA provided copies of the formal letters containing the deadlines to the System.

EPA requested to see the finalized Emergency Response Plan ("ERP"), which was certified as completed on January 10, 2022. Darold Harlan opened the ERP on a laptop. The ERP was complete and followed EPA's template.

EPA asked the System about the current status of billing and if the billing format had been updated. The System representatives present at the time of the inspection directed the question to

the City Manager, Ellis Mitchell, and the billing staff, who were not present at the time of the opening conference.

EPA requested a copy of the Technical, Managerial and Financial ("TMF") Capacity Study that the System generated pursuant to EGLE's Administrative Consent Order. The System representatives present at the time of the inspection referred EPA to the City Manager and stated that the City Manager would best be able to provide that information. EPA noted that they will follow up with the City Manager for a copy of the TMF Capacity Study and updates on the billing format.

2.2 Physical Areas Inspected

Following the opening conference, the EPA inspection team met Tom Coath, who manages the Supervisory Control and Data Acquisition ("SCADA") system for the System, to review the SCADA system and its alarms. All photos taken during the inspection are found in Appendix A. Tom Coath first showed the EPA team the System's main home SCADA screen which displayed the operational status of both the high and low service pumps, the north and south plate settlers, the north and south flocculators, the twelve filters, the water level in the clear well, the water level in the elevated tank, the high service chlorine residual and the lab tap water chlorine residual (See Photo 1) at the time of inspection. A low level alarm for the finished water chlorine residual at the plant's tap was enabled and set at 0.8 milligrams per liter ("mg/L"). At the time of inspection, the high service pumps not in use due to low demand and were set to standby. A single pump, known as low service pump 2 ("LS2"), was in operation. The System was operating filters 5, 6, 7, 8, 11 and 12 at the time of inspection. EPA reviewed the SCADA live monitoring screens for all the assets that were connected to the SCADA system, took photos (See Photos 2 through 8), and recorded the monitoring values that were present at the time. All numeric readings recorded while reviewing the SCADA system during the inspection can be found in Appendix C.

Tom Coath also showed the EPA inspection team the SCADA alarms and call out feature. He first showed EPA what monitoring devices had alarms enabled at the time and the set points that would trigger an alarm to be issued (See Photos 9 and 10). EPA requested the System to run a test alarm and demonstrate how the SCADA system makes call outs when an alarm is triggered. Tom Coath pulled up the SCADA alarm history and began a test alarm. He showed that anytime an alarm is triggered this event is recorded to the alarm's history page in SCADA (See Photo 11). EPA observed the test alarm appear and saw a log of past alarms that have been issued. Tom Coath explained that once an alarm is triggered the System uses a program called WIN-911 to perform the call out. WIN-911 has a preset call list of System staff that it will run through until someone answers and acknowledges it. The first people who are called are Abul Ahmed, Darold Harlan and Demetrius Meeks. The alarms will continue to go off and appear in SCADA until someone addresses it. This can be done through the call out system or on one of the computers at the drinking water plant connected to SCADA. WIN-911 creates a log every time a call out is initiated of who was called, when they were called and who in the end acknowledged the alarm was going off (See Photo 12). All the monitoring data, SCADA information and alarm records are backed up daily to a separate computer for record redundancy.

The EPA inspection team then followed Abul Ahmed to the intake of raw water into the treatment plant. Near the intake for raw water into the treatment plant is the raw water turbidimeter (See Photo 14). The raw water chlorine analyzer is not being used since the System does not inject chlorine at the intake. All numeric readings recorded while walking through the drinking water plant during the inspection can be found in Appendix C. The System stated that chlorine is injected into the raw water before it splits into the North and South Plate Settlers. The raw water turbidimeter was online and connected to SCADA.

The team walked to the intake of raw water into the North and South Plate Settlers. On the North Plate Settler was the flow meter measuring the raw water flow entering the plate settler (See Photo 16). On the South Plate Settler was the flow meter measuring the raw water flow entering the plate settler (See Photos 17 and 18). Both raw water flow meters were online and connected to SCADA.

On the opposite end of both plate settlers, there are monitoring devices measuring the settled water leaving the plate settlers. On the South Plate Settler is a settled water turbidimeter (See Photo 19). Settled water from the South Plate Settler is mixed with settled water leaving the North Plate Settler. On the pipe near the North Plate Settler, post point of mixing with the South Plate Settler, is a settled water turbidimeter and settled water chlorine analyzer (See Photo 20). Both settled water turbidimeters were reading the turbidity, but SCADA reported the values at 0.000 NTU. The settled water chlorine analyzer was online and connected to SCADA.

The team walked through the flocculation basin area to the pipe galley for the filters. Inside the filter pipe galley was a backwash flow meter, which only runs during a backwash. At the time of the inspection, the System was not conducting a backwash and the flow meter read 0 gallons (See Photo 22). The team walked into a room that contained the individual turbidimeters for each filter. Abul Ahmed noted calibration for all turbidimeters occurs the first week of every month. The EPA team recorded the numeric readouts for all filter turbidimeters currently in operation (Filters 5-8, 11, and 12) in Appendix C (also see Photos 23 through 25). The individual filter turbidimeters were online and connected to SCADA.

The team walked upstairs to the main filter room to inspect the filters. Each filter has its own Programmable Logic Controller ("PLC") board (See Photos 28 through 30) and separate screens reading the individual turbidity of each filter in operation (See Photos 26 and 27). At the time of inspection, all the filters did not have automatic backwash functionality in place. All backwashes are initiated manually.

The System is in the middle of repairing and upgrading the existing filters pursuant to the UAO. Part of the UAO requires the System to repair and bring online enough filters necessary to produce finished water, at the approved filtration rate of 2 gallons per minute per square foot (gpm/ft2) over the entire filter run, to meet the daily demand during the hours of plant operation along with adequate redundancy. The UAO also required the System to return the filters needed to meet daily demand with adequate redundancy to full backwash functionality.

Paragraph 112(a): "The System must immediately identify the number of filters necessary to produce the daily demand during the hours of plant operation along with adequate redundancy

and prioritize repair of those filters. The approved filtration rate is 2 gpm/ft2 over the entire filter run."

Paragraph 112(b): "Within fifteen (15) days of the Effective Date of this Order, the System must initiate repairs to return the full backwash functionality to the water treatment plant filters..."

The System stated that it needs four individual filters in place to meet daily demand with redundancy. At the time of the inspection, EPA observed filters 5, 6, 7, 8, 11, and 12 were online and functioning. During the inspection, the System stated that they plan on having filters 5, 6, 7, 8, 9, 10, 11 and 12 available for service and have initiated repairs and upgrades for these. Filters 1, 2, 3 and 4 will be taken out of service and abandoned in place. Once all these filters are repaired, Abul Ahmed stated that they plan to rotate the operation between these filters for additional redundancy and to increase their longevity. At the time of inspection, filters 9 and 10 were not in operation and the System was waiting on a replacement waste actuator to come in so both filters can be repaired. Once filters 9 and 10 are repaired, the System plans on upgrading the existing filter controls for the filters they plan to continually have in service. Filters 5, 6, 7, 8, 9, 10, 11 and 12 will be upgraded to PLC control with a Human-Machine Interface ("HMI"). With this upgrade, the operators will be able to initiate and control a backwash through the SCADA or by the local HMI screen on each filter. The PLC will be able to automatically actuate each valve in the appropriate sequence for the proper amount of time until the backwash process is complete. At all times the status of each valve and the filters will be able to be displayed through SCADA or the local HMI. This upgrade will also allow for flow in each filter to be controlled through the SCADA or HMI. The operators will be able to establish a flow set point in the SCADA system or the local HMI and this will allow the PLC to open and close the effluent actuator and valve to reach the preset flow automatically. The level of water in each of the filters will also automatically be maintained through the PLC by manipulating the influent valve of the filters. In the meantime, of these large-scale upgrades being completed, the System has planned to have the existing actuators and actuator controls for the filters currently in use serviced. This will be done to ensure that each actuator functions correctly in local control and in remote control through the current filter selector switches until the large upgrade is completed.

Inside the main filter room, the team was met by Ellis Mitchell, City Manager. Introductions were made and the EPA team asked Mr. Mitchell if the billing language was updated to include the lead Public Education ("PE") language and sent out with the most recent billing cycle. Mr. Mitchell was unable to confirm if the updated billing language was mailed out for the most recent billing cycle. On March 2, 2022, EPA received an email from EGLE stating the updated billing language was mailed starting with the January cycle, along with an attachment of a mailed bill example from the January 2022 cycle. On March 15, 2022, EPA received an email from the City stating the updated billing language was mailed with the January water bills, along with an attachment of a mailed bill example from the January 2022 cycle.

Following the filters, the team walked to a finished water chlorine analyzer near the high service pumps (See Photo 31) and the high service flow meter measuring flow into the distribution system (See Photo 33). The System stated that the chlorine analyzer near the high service pumps is a backup analyzer. The System stated that the primary finished water chlorine analyzer used for compliance monitoring is in the onsite laboratory (See Photo 34). Both finished water

chlorine analyzers and high service flow meter were online and connected to SCADA. The System stated that the finished water chlorine analyzer used for compliance monitoring in the onsite laboratory is taking continuous readings from the suction well.

Following the onsite lab, the team walked to the bulk storage tank building which is in a separate building and located outside the main treatment plant facility. This building has two rooms and the first contains the three bulk chlorine storage tanks. The three bulk chlorine storage tanks are each equipped with depth sensors that continuously monitor the levels inside the tanks (See Photo 36). The chlorine tank depth sensors were online and connected to SCADA (See Photo 25). The second room of the building contained three bulk alum storage tanks and one bulk fluoride storage tank. The three bulk alum storage tanks each equipped with depth sensors that continuously monitor the levels inside the tanks (See Photos 37 and 38). The flouride storage tank is no longer in service nor utilized by the system.

Following the bulk storage tank building, the team walked to the day tank storage area inside the main treatment plant. Inside the area, a meter reads the number of gallons used for the fluoride saturator (See Photo 40). The number of gallons used is included in a calculation to determine the net weight for flouride dosage. The weight for the flouride day tank was located in the storage area and was online and connected to SCADA (See Photo 41). Two chlorine day tanks were located in the storage area: one pre-chlorine and one post-chlorine. Both day tanks had devices that measured the weight of chlorine in each tank (See Photos 42 and 43). Both chlorine day tank devices were online and connected to SCADA.

At the conclusion of the inspection, EPA reviewed the monitoring data collected when visiting each device to what was being reported through SCADA, noting the difference in time when recording. EPA noted a difference of around 1 mg/L between the SCADA and device reading for the primary finished water chlorine analyzer. The System representatives noted that the SCADA and devices readings were taken over an hour apart from one another. They explained that their SCADA updates the screens every fifteen minutes, and this was their explanation why the two readings were different. EPA took a reading of the primary finished water chlorine analyzer from SCADA and the device in the lab at the same time and both were outputting the same number. EPA asked if it is normal for the System to see the chlorine residual increase by almost 1 mg/L between the morning and afternoon readings. The System stated that is normal for them and they see this happen daily during operations. The System displayed the historical data for chlorine residual readings for the finished water for EPA to observe and noted an increase during the time of the inspection (See Photo 47). The System stated that this spike is due to the chlorine feed only being run during hours of operation, so they see the chlorine residual gradually drop overnight and rise again in the morning when the plant is fully operational. EPA also noted that the SCADA alarms for Filter 12 turbidity and Reservoirs levels were enabled (See Photos 45 and 46).

2.3 Closing Conference

The closing conference was held at 11:20 AM EST at the Benton Harbor drinking water treatment plant. Ms. Anderson shared EPA's preliminary observations with Abul Ahmed, Blair

Selover, Darold Harlan, Rob Jones, and Ernie Sarkipato. A summary of the Areas of Concern is described in Section 3 of this report.

3 AREAS OF CONCERN AND OBSERVATIONS

3.1 Areas of Concern

EPA identified the following areas of concern based on the inspection:

1. The SCADA alarms for Filter 12 turbidity and the Reservoir levels were disabled when observing the SCADA system at the beginning of the inspection. When EPA checked the SCADA system at the end of the inspection the System had enabled the alarms.

2. The System was not able to confirm during the inspection if the formatting of the bills has been updated to allow for additional language or documents to be sent. EPA did not receive notice that the January bills were updated and mailed out until March 15, 2022.

3. The settled water turbidimeters on the North and South Plate Settlers do not seem to be reporting to SCADA.

4. During the inspection EPA observed an increase of approximately 1 mg/L in the chlorine residual from the start of the inspection around 8:30 AM to around 10:00 AM. At the time of the inspection, it was EPA's understanding that the chlorine feed was occurring upstream of the reservoirs. Based on where chlorine is being applied to the water upstream of the reservoirs, the amount of chlorine being injected, and the location of the finished water chlorine analyzer taking measurements from the suction well it is highly unlikely that the chlorine dosing was occurring at a location upstream of the reservoirs. In follow up conversation after the inspection, it has been determined that chlorine is being injected into the suction well and not upstream of the filters as previously stated and therefore the chlorine residual spike was being observed during the day operations of the plant. The chlorine dosing directly into the suction well means that the existing continuous chlorine analyzers are not an accurate representation of the residual disinfectant levels throughout the treatment process.

Additional Observations

There were no additional observations.

DOCUMENTS RECEIVED AND REFERENCED

No documents were received during this inspection. EPA review the Emergency Response Plan onsite. EPA requested a copy of the TMF Capacity Study and has not received a copy at the time of this report. EPA requested a copy of the updated water bills and received a copy on March 15, 2022.

APPENDIX A: Photolog

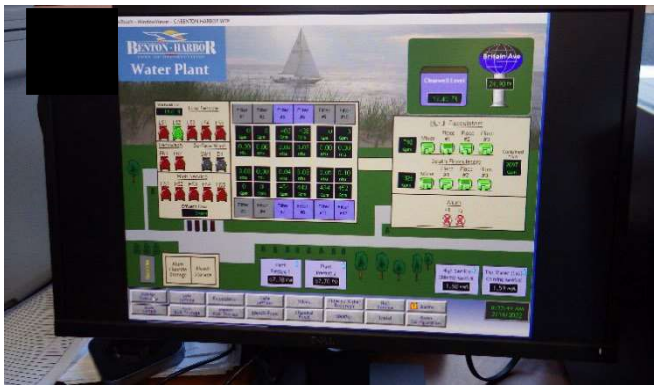
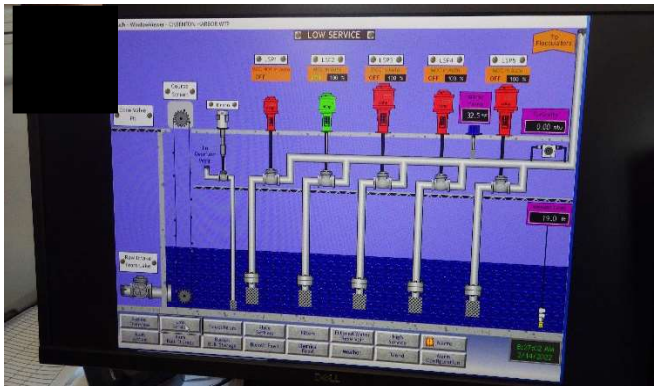
Photo 1 File Name: RIMG0493 Location: Benton Harbor PWS 02/14/2022 08:22 AM (ET) Photographer: Taylor Girouard Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Main Drinking Water Plant display through SCADA.	
Photo 2 File Name: RIMG0494 Location: Benton Harbor PWS 02/14/2022 08:27 AM (ET) Photographer: Taylor Girouard Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Low service pumps display through SCADA.	

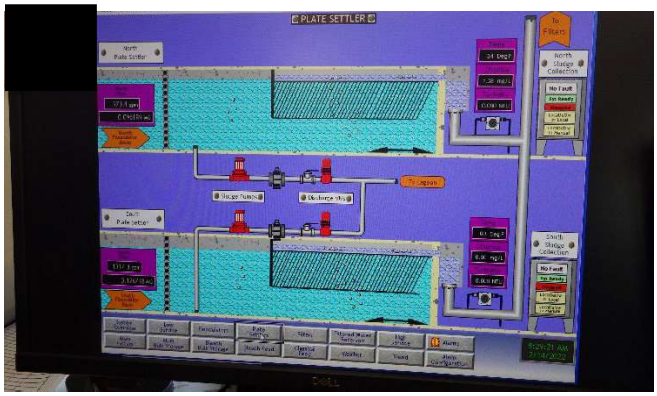
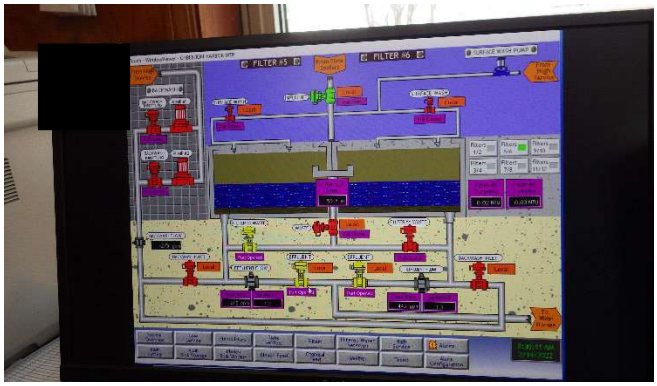
Photo 3 File Name: RIMG0495 Location: Benton Harbor PWS 02/14/2022 08:29 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: North and South Plate Settlers display through SCADA.	
Photo 4 File Name: RIMG0496 Location: Benton Harbor PWS 02/14/2022 08:30 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Filters 5 and 6 display through SCADA.	

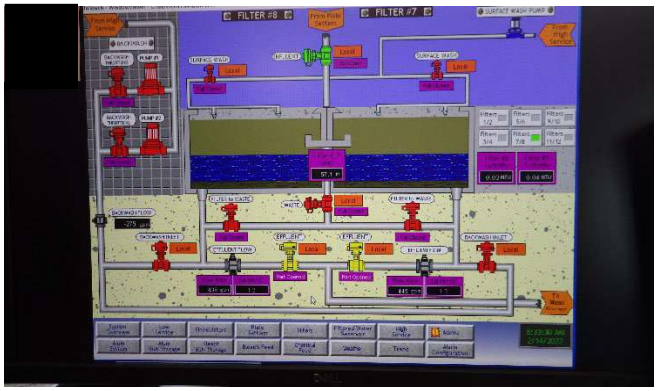
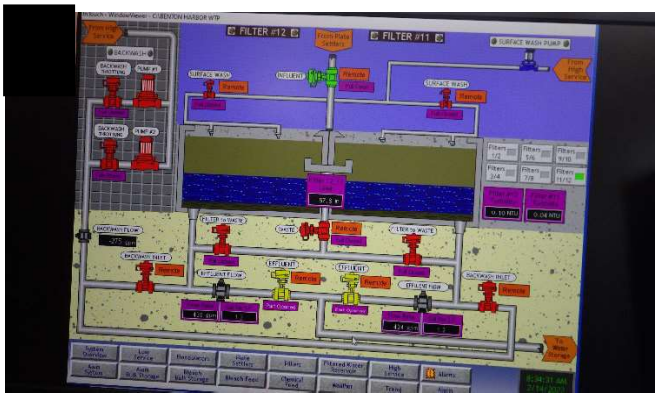
Photo 5 File Name: RIMG0497 Location: Benton Harbor PWS 02/14/2022 08:33 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Filters 7 and 8 display through SCADA.	
Photo 6 File Name: RIMG0498 Location: Benton Harbor PWS 02/14/2022 08:34 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Filters 11 and 12 through SCADA.	

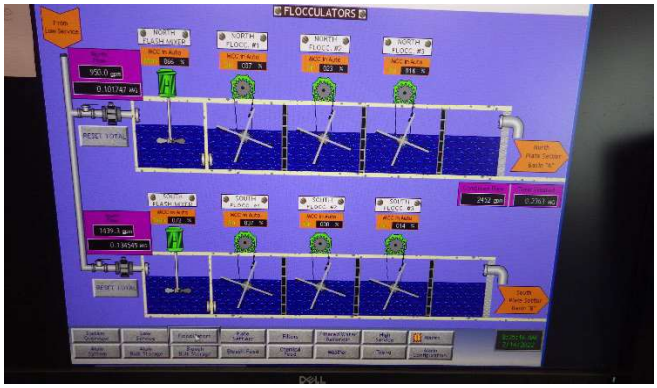
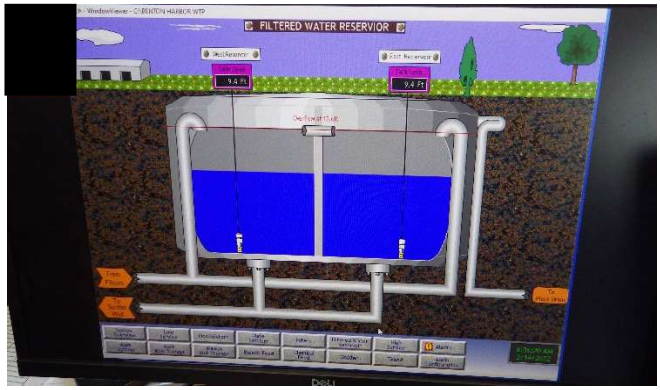
Photo 7 File Name: RIMG0499 Location: Benton Harbor PWS 02/14/2022 08:35 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Flocculator basin display through SCADA.	
Photo 8 File Name: RIMG0500 Location: Benton Harbor PWS 02/14/2022 08:36 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Filtered water reservoir display through SCADA.	

Photo 9 File Name: RIMG0501 Location: Benton Harbor PWS 02/14/2022 08:37 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: SCADA system alarms and set points Page 1.	
Photo 10 File Name: RIMG0502 Location: Benton Harbor PWS 02/14/2022 08:38 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: SCADA system alarms and set points Page 2.	

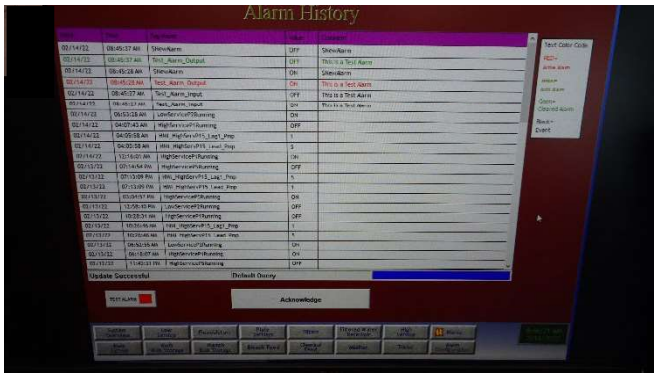
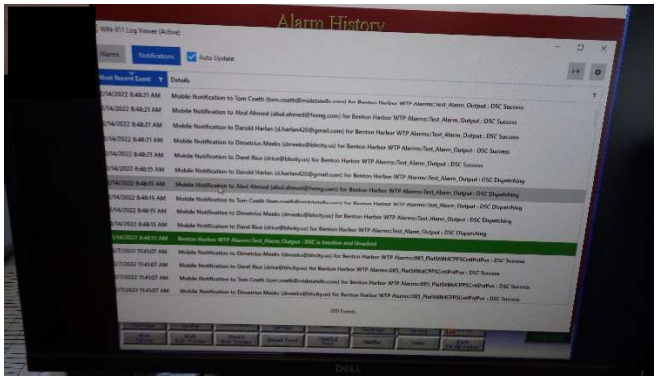
Photo 11 File Name: RIMG0503 Location: Benton Harbor PWS 02/14/2022 08:46 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Alarm history display through SCADA. Test alarms being triggered through SCADA.	
Photo 12 File Name: RIMG0504 Location: Benton Harbor PWS 02/14/2022 08:48 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: WIN-911 notification log of the test alarms being triggered and acknowledged.	

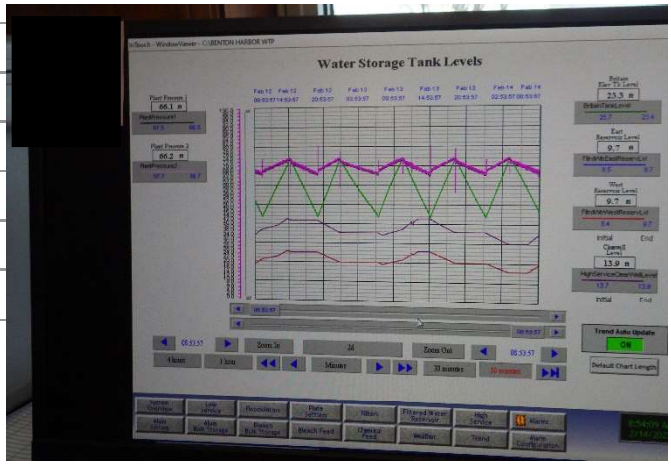
Photo 13 File Name: RIMG0505 Location: Benton Harbor PWS 02/14/2022 08:54 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Water reservoirs displayed through SCADA.	
Photo 14 File Name: RIMG0506 Location: Benton Harbor PWS 02/14/2022 09:00 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Raw water turbidimeter.	

Photo 15 File Name: RIMG0507 Location: Benton Harbor PWS 02/14/2022 09:02 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Drip observed from raw water pipes.	
Photo 16 File Name: RIMG0508 Location: Benton Harbor PWS 02/14/2022 09:05 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Raw water flow meter on the North Plate Settler.	

Photo 17 File Name: RIMG0509 Location: Benton Harbor PWS 02/14/2022 09:06 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Raw water flow meter for the South Plate Settler.	
Photo 18 File Name: RIMG0510 Location: Benton Harbor PWS 02/14/2022 09:07 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Repeat image of Photo 17. Raw water flow meter for the South Plate Settler.	

Photo 19 File Name: RIMG0511 Location: Benton Harbor PWS 02/14/2022 09:09 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: South Plate Settler turbidimeter.	
Photo 20 File Name: RIMG0512 Location: Benton Harbor PWS 02/14/2022 09:09 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: North Plate Settler turbidimeter and chlorine analyzer.	

Photo 21 File Name: RIMG0513 Location: Benton Harbor PWS 02/14/2022 09:11 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Water draining from turbidimeter to draining in ground around the South Plate Settler backwash flow meter.	
Photo 22 File Name: RIMG0514 Location: Benton Harbor PWS 02/14/2022 09:30 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Backwash flow meter.	

Photo 23 File Name: RIMG0515 Location: Benton Harbor PWS 02/14/2022 09:37 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Filters 5 and 6 turbidimeter	
Photo 24 File Name: RIMG0516 Location: Benton Harbor PWS 02/14/2022 09:37 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Filters 11 and 12 turbidimeter.	

Photo 25 File Name: RIMG0517 Location: Benton Harbor PWS 02/14/2022 09:37 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Filters 7 and 8 turbidimeter.	
Photo 26 File Name: RIMG0518 Location: Benton Harbor PWS 02/14/2022 09:40 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: North side filter panel that displays turbidity readings for filters 1, 2, 5, 6, 9, and 10.	

Photo 27 File Name: RIMG0519 Location: Benton Harbor PWS 02/14/2022 09:41 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: South side filter panel that displays turbidity readings for filters 3, 4, 7, 8, 11 and 12.	
Photo 28 File Name: RIMG0520 Location: Benton Harbor PWS 02/14/2022 09:43 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: PLC for filters 5 and 6.	

Photo 29 File Name: RIMG0521 Location: Benton Harbor PWS 02/14/2022 09:43 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: PLC for filters 7 and 8.	
Photo 30 File Name: RIMG0522 Location: Benton Harbor PWS 02/14/2022 09:44 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: PLC for filters 11 and 12.	

Photo 31 File Name: RIMG0523 Location: Benton Harbor PWS 02/14/2022 09:51 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Chlorine analyzer located near the high service pumps. This analyzer is the backup analyzer for reading chlorine residuals on finished water.	
Photo 32 File Name: RIMG0524 Location: Benton Harbor PWS 02/14/2022 09:53 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Non-operable flow meter.	

Photo 33 File Name: RIMG0525 Location: Benton Harbor PWS 02/14/2022 09:56 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: High service flow meter.	
Photo 34 File Name: RIMG0526 Location: Benton Harbor PWS 02/14/2022 10:01 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Finished water chlorine analyzer located in the laboratory at the tap.	

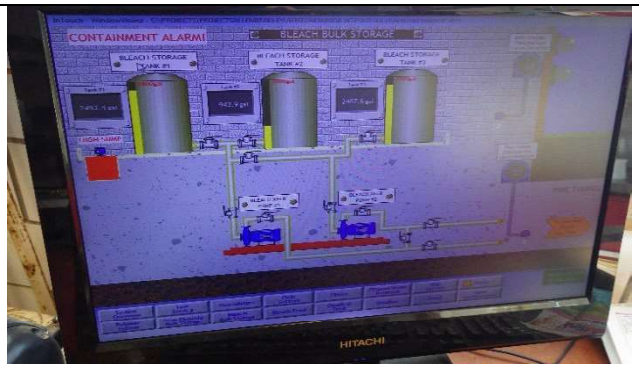
Photo 35 File Name: RIMG0527 Location: Benton Harbor PWS 02/14/2022 10:03 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Chlorine bulk tank SCADA display.	
Photo 36 File Name: RIMG0528 Location: Benton Harbor PWS 02/14/2022 10:05 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Depth sensor for the three bulk chlorine tanks.	

Photo 37 File Name: RIMG0529 Location: Benton Harbor PWS 02/14/2022 10:09 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Depth sensor for Alum bulk tanks 1 and 2.	
Photo 38 File Name: RIMG0530 Location: Benton Harbor PWS 02/14/2022 10:10 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Depth sensor for Alum bulk tank 3.	

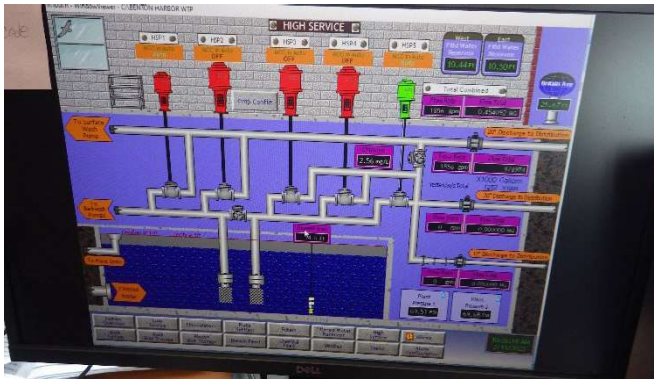
Photo 39 File Name: RIMG0531 Location: Benton Harbor PWS 02/14/2022 10:26 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: High service pump display through SCADA.	
Photo 40 File Name: RIMG0532 Location: Benton Harbor PWS 02/14/2022 10:29 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Gallons of water pulled for fluoride saturator.	

Photo 41 File Name: RIMG0533 Location: Benton Harbor PWS 02/14/2022 10:30 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Fluoride day tank weight.	
Photo 42 File Name: RIMG0534 Location: Benton Harbor PWS 02/14/2022 10:33 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Pre-chlorine day tank scales and weights.	

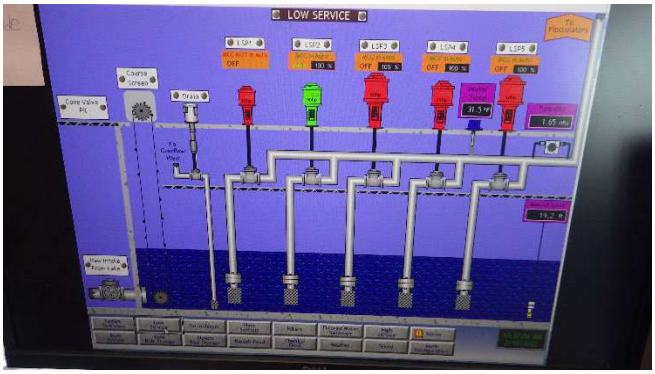
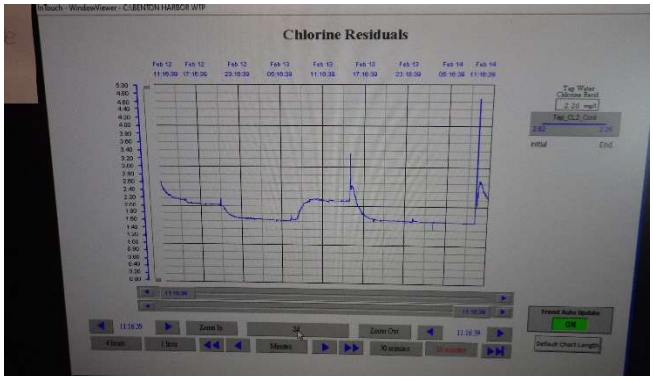
Photo 43 File Name: RIMG0535 Location: Benton Harbor PWS 02/14/2022 10:33 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Post-chlorine day tank scales and weight.	
Photo 44 File Name: RIMG0536 Location: Benton Harbor PWS 02/14/2022 10:37 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Low service pump display through SCADA.	

Photo 45 File Name: RIMG0537 Location: Benton Harbor PWS 02/14/2022 11:14 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: SCADA system alarms and set points Page 1.	
Photo 46 File Name: RIMG0538 Location: Benton Harbor PWS 02/14/2022 11:14 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: SCADA system alarms and set points Page 2.	

Photo 47 File Name: RIMG0539 Location: Benton Harbor PWS 02/14/2022 11:16 AM (ET) Photographer: Sasha Letuchy Camera: RICOH WG-4 GPS Direction of Photo: Inside Description: Historical chlorine residual readings for February 14, 2022.	

APPENDIX B: Sign-In Sheet

EPA
United States Environmental Protection Agency

Sign in Sheet

PWS ID and System Name:

Date: 2/14/22

Name:	Time	Entity	Title	Phone/email
Blair Selover	8:15 AM	FVOP	Group Manager	810 252 8884 bselover@fv-operations.com
Rob Jong	"	FVOP		810 220 9441
Darren Hacca-	"	"	Project Manager	(260) 224-5578
ABUL AHMED	"	FVOP	Project Manage	(586) 668-6169 aahmed@fv-operations.com
Ernie Sarkipato	"	EGLE	Engineer	616-307-0261
Victoria Anderson	8:16 AM	USEPA	Enforcement Officer	312-353-4367
Sasha Letuchy	"	USEPA	"	312 886 6035
Tayler Gunnard	8:50 AM	US EPA	"	312-353-1341

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APPENDIX C: Table of Readings from the SCADA System and Monitoring Devices

Monitoring Device*	SCADA Reading	Time of SCADA Reading	Monitoring Device Reading	Time of Monitoring Device Reading**
Filter 5 Effluent Flow Meter	402 gpm	8:22 AM EST	394.2 gpm	9:43 AM EST
Filter 6 Effluent Flow Meter	438 gpm	8:22 AM	380.8 gpm	9:43 AM
Filter 7 Effluent Flow Meter	451 gpm	8:22 AM	360.1 gpm	9:43 AM
Filter 8 Effluent Flow Meter	440 gpm	8:22 AM	397.3 gpm	9:43 AM
Filter 11 Effluent Flow Meter	434 gpm	8:22 AM	420 gpm	9:44 AM
Filter 12 Effluent Flow Meter	452 gpm	8:22 AM	441 gpm	9:44 AM
Filter 5 Turbidimeter	0.02 NTU	8:22 AM	0.029 NTU	9:37 AM
Filter 6 Turbidimeter	0.03 NTU	8:22 AM	0.025 NTU	9:37 AM
Filter 7 Turbidimeter	0.04 NTU	8:22 AM	0.039 NTU	9:37 AM
Filter 8 Turbidimeter	0.03 NTU	8:22 AM	0.031 NTU	9:37 AM
Filter 11 Turbidimeter	0.05 NTU	8:22 AM	0.040 NTU	9:37 AM
Filter 12 Turbidimeter	0.10 NTU	8:22 AM	0.098 NTU	9:37 AM
High Service Flow Meter	0 gpm	8:22 AM	1,758 gpm	9:56 AM
High Service Chlorine Analyzer	1.68 mg/L	8:22 AM	2.73 mg/L	9:51 AM
Tap Water (Lab) Chlorine Analyzer	1.59 mg/L	8:22 AM	2.67 mg/L	10:01 AM
North Plate Settler Flow Meter	973.4 gpm	8:29 AM	742.9 gpm	9:05 AM
North Plate Settler Turbidimeter	0.000 NTU	8:29 AM	0.170 NTU	9:09 AM
North Plate Settler Chlorine Analyzer	1.38 mg/L	8:29 AM	1.22 mg/L	9:09 AM
South Plate Settler Flow Meter	1,317.3 gpm	8:29 AM	1,534.0 gpm	9:07 AM
South Plate Settler Turbidimeter	0.000 NTU	8:29 AM	0.487 NTU	9:09 AM
Chlorine Bulk Tank 1 Weight	2,493.4 gal	10:03 AM	2,493.0 gal	10:05 AM
Chlorine Bulk Tank 2 Weight	943.9 gal	10:03 AM	950.8 gal	10:05 AM
Chlorine Bulk Tank 3 Weight	2,487.6 gal	10:03 AM	2,487.5 gal	10:05 AM

*Readings were recorded from the SCADA system and the device themselves at different points in time, possibly accounting for the differences.

**Device reading from the first photo; multiple photos were taken of some of the devices.