STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
GRAND RAPIDS DISTRICT OFFICE

GRETCHEN WHITMER
GOVERNOR

LIESL EICHLER CLARK
DIRECTOR

November 2, 2021

VIA E-MAIL AND U.S. MAIL

The Honorable Marcus Muhammad
Mayor of Benton Harbor
200 Wall Street
Benton Harbor, Michigan 49022

WSSN: 00600
County: Berrien

Mr. Ellis Mitchell, City Manager
City of Benton Harbor
200 Wall Street
Benton Harbor, Michigan 49022

Dear Mayor Muhammad and Mr. Mitchell:

SUBJECT: Significant Deficiency Violation Notice; City of Benton Harbor;
2021 Water System Sanitary Survey

This letter confirms the Department of Environment, Great Lakes, and Energy's (EGLE's) meetings with City of Benton Harbor (City) water system personnel, on September 21 and 22, 2021, and October 13 and 21, 2021, to participate in a joint compliance inspection along with the U.S. Environmental Protection Agency (EPA), and to conduct a Sanitary Survey (Survey) of the City's water system. Due to the extensive nature of the findings during the Survey, this letter will present the most significant findings, discuss areas for necessary improvement, and identify timelines for corrective action where appropriate. The purpose of a Survey is to evaluate the City's water system with respect to the requirements of the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399). It is also an opportunity to update EGLE's records, provide technical assistance, and identify potential risks that may adversely affect drinking water quality.

Since the last Survey, EGLE acknowledges that the City has completed the following water facility improvements and operations:

1. Secured partial contract operations with oversight of the treatment and distribution of drinking water.

2. Selected an independent third party to conduct a study into the effects of corrosion in the system and optimization of current corrosion treatment.

3. Moved the coagulant feed location to the existing rapid mix.

4. Installed an online chlorine analyzer at the entry point to distribution system (EPTDS).

5. Completed rehabilitation of the elevated storage tank.

6. Completed inspection and partial rehabilitation to the raw water intake crib.

7. Developed and implemented standard operating procedures (SOPs) for water plant startup, and backwashing filters.

8. Developed a rate collection procedure.

9. Completed several water main replacement projects.

10. Completed an assessment of hydrants and valves in the distribution system.

11. Installed a finished water flow meter and phosphate feed system.

12. Secured initial contracts for the removal of lead service lines.

13. Secured a study and work plan for the completion of the Distribution System Materials Inventory.

14. Rehabilitation activities in settling basins, including sludge removal equipment.

15. Initiated a capacity study.

Since the 2018 Survey completed by EGLE, the City has worked to coordinate a compliance schedule under the first Amended Administrative Consent Order (AACO). Although some of the findings from 2018 have been addressed, several remain unaddressed at the time of this Survey. **EGLE has completed this capacity assessment, as outlined in R 325.1003b of Act 399, and finds the City lacks the technical, financial, and managerial capacity to meet all requirements of this act and the rules promulgated under Act 399.**

The following table summarizes EGLE's final findings from the Survey of the water system:

Survey Element	Findings
Source	Recommendations
Treatment	**Minor Deficiency Identified**
Distribution System	**Significant Deficiency Identified**
Finished Water Storage	**Significant Deficiency Identified**

Pumps	Minor Deficiency Identified
Monitoring & Reporting	**Significant Deficiency Identified**
Management & Operations	**Significant Deficiency Identified**
Operator Compliance	Recommendations
Security	Recommendations
Financial	**Significant Deficiency Identified**
Other	Minor Deficiency Identified

Significant Deficiencies:

Significant deficiencies are serious sanitary deficiencies identified in water systems which include, but are not limited to, defects in design, operation, maintenance, or a failure or malfunction of the sources; treatment, storage, or distribution systems that are determined to be causing, or have the potential to cause, contamination into the public water supply.

Significant deficiencies must be corrected within 120 days of the date of this letter, or a Corrective Action Plan, approved by EGLE, must be completed within 120 days of the date of this letter. Failure to meet the 120-day deadline is a treatment technique violation.

During this Survey, a number of significant deficiencies were identified:

1. The City lacks the Technical, Managerial, and Financial (TMF) capacity necessary to support the water utility. The following items were previously identified in the 2018 Survey, or are additional observations related to insufficient TMF capacity. The City is currently conducting a study of alternatives to achieve TMF capacity, including a financial analysis. The below findings must be addressed during the implementation period as outlined in the AACO. Items under 1(a) to 1(g), listed below, are subject to the compliance schedule agreed upon in the AACO and are not subject to a new 120-day deadline. EGLE does not consider the significant deficiency for insufficient TMF capacity resolved until each of these items are corrected.

    a. R 325.11108 requires a water supply to have sufficient valves in the distribution system to minimize interruptions in service and minimize sanitary hazards during construction or repairs. In addition, R 325.11111 requires adequate records be maintained on the distribution system components including hydrants and valves. The City has struggled in the past with the ability to isolate areas of town, due to lacking or inoperable valves. Since the last Survey, the City has conducted a preliminary inventory, by contract with Wachs Water, which identified various issues

with some valves in the system, including a general lack of isolation valves, some inoperable valves, and some found to be closed. Insufficient working isolation valves can lead to increased sanitary hazards during construction or repairs. A comprehensive plan for valve maintenance must be implemented to restore technical capacity for operation of the water system.

b. R 325.11105 (Rule 1105) requires a water supply distribution system to maintain a minimum pressure of 20 psi throughout the system during emergencies such as firefighting and allows the department to prohibit installation of fire hydrants in areas where fire flow is not sufficient. From our discussion with staff and through the hydrant flow testing activities conducted during the last reliability study, a number of hydrants in town have low flow or zero flow. Since the last Survey, the City has conducted a preliminary inventory, by contract with Wachs Water, which identified various issues with some hydrants, including inoperability and low flow, as well as lacking isolation valves. Lack of working hydrants with sufficient flow is a violation of Rule 1105 and could result in a public safety concern should an emergency occur (i.e., fire). A plan for complete hydrant maintenance must be implemented to restore technical capacity for operation of the water system.

c. R 325.11404 requires a water supply to develop a comprehensive control program for the elimination and prevention of all cross connections. The program must include education, inspection, and preventer testing in all customer sectors including residential. In addition, an annual report summarizing activities must be submitted to EGLE. The City has not met cross connection requirements for several years, based on annual reporting. The City must dedicate a trained staff person to implement this program or obtain a contract with a qualified professional company to implement the program. In addition, the following concerns were noted at the water treatment facility:

    i. Untested backflow preventers were identified, including on the fluoride saturator feed line, chlorine carrier water line, and surface water feed line.
    ii. The raw water screen is fed by a potable water sprayer without protection.

d. R 325.10611n requires any lack of maintenance of the source, treatment, distribution, or storage, which has the potential for causing the introduction of contamination, be cited as a significant deficiency. A general lack of maintenance at the water treatment plant was noted, and discussions with the maintenance supervisor indicated a lack of staffing and resources. The

following maintenance items, when considered in aggregate, are indicative of a lack of TMF capacity:

i. Spilled chemicals at various locations (alum day tank, chlorine day tank, alum bulk tank, phosphate scale), in part due to overfilling with no overflow.
ii. Filters 9 and 10 are out of service due to non-working waste valve actuator.
iii. Filter 5 surface wash spray arms were not working.
iv. Flooding/standing water was noted at two locations (next to alum, also in basement next to high service pumps).
v. South basin sludge removal (shear pins, sprockets, and sludge discharge valve actuator).
vi. Lack of progress on proper cleanup and disposal of alum solids.
vii. Sludge Lagoon vegetation is overgrown, overflow not visible.
viii. Filters 1 – 4 have been improperly abandoned in place, with respect to stagnant feed piping that is connected to active filters.
ix. Inoperable low service pumps and temporary installations of high service pump motors indicate a significant lack of maintenance on pumps.

e. R 325.10604f (3)(c) outlines requirements for a corrosion control study to be completed by the City. A Corrosion Control Optimization Study was required to be submitted under the AACO. While the City met the deadline with a study submittal, it was not approved by EGLE after lengthy discussions and multiple revisions. The City has since engaged an independent third-party corrosion expert to reformulate the approach to the study. This failure to successfully implement a study in a timely fashion indicates a lack of managerial capacity and has resulted in significant delays to better understand the corrosion in the water system. Continued focus on this study is imperative to ensure public health protection and compliance with Act 399.

f. Part 15 of the Act 399 administrative rules outlines the general requirements for operation reports and recordkeeping. The historic recordkeeping system at the water plant is lacking, making it difficult to access records. Insufficient records can lead to difficulties in planning for necessary maintenance and upgrades, as well as in establishing a baseline for treatment and water quality. The City must improve the current system for recordkeeping to re-establish its technical and managerial capacity.

g. The financial capacity of the water system continues to be a significant concern. Rate collection procedures were developed and implemented to fulfill requirements of the AACO, resulting in a more consistent revenue stream. However, these procedures were halted during the COVID-19 pandemic out of concern for basic sanitation needs of residents. A review of financial records, provided by the City for the Survey, indicates difficulty in covering operational costs and implementing necessary capital improvement projects while also maintaining affordability. A demonstration of the financial capability of the water system to operate sustainably and in compliance is needed to restore financial capacity.

The following are newly identified significant deficiencies that must be corrected within 120 days or incorporated into an approved compliance schedule within 120 days.

2. Rule 1112(c) states that all treated water storage tanks shall have no unprotected openings, and R 325.10113 references the Recommended Standards for Water Works, prepared by the Great Lakes-Upper Mississippi River Board of State Sanitary Engineers (“Recommended Standards”). Section 7.0 of the Recommended Standards includes requirements that storage tank overflow pipes and vents shall be fitted with 24-mesh non-corrodible screen, overflows shall discharge at least 18 inches above grade and flood level and should be visible. Recommended Standards also requires ground level tanks shall have vents that open downward and terminate at least 24 inches above the roof or sod, and a 24-mesh non-corrodible screen must be installed within the pipe to prevent vandalism. Last, access hatches to a tank’s wet interior shall be curbed and fitted with a shoe box style cover, shall be locked, and have a watertight seal. The following items are identified as requiring immediate attention or investigation:

    a. Finished Water Reservoir and High Service Suction Well had some vents with a broken or no screen. A temporary screen was fitted immediately, but a permanent solution is required to comply with the above requirements. In addition, the vents do not terminate at least 24 inches above grade.

    b. Finished Water Reservoir hatches were not able to be accessed due to concerns over the unsanitary condition of the hatches. For example, some of the hatches do not have a curb above grade and were partially covered in soil/vegetation. In addition, areas of crumbling concrete were noted near reservoir access hatches. A full assessment of current condition and design of the reservoir hatches is needed to ensure a sanitary condition.

    c. High Service Suction Well has an access hatch that was not verified to be compliant, and a makeshift plywood cover with tar sealant is located in the venturi room above, which may have been installed to prevent entry of

contaminants to finished water below. These items require investigation and correction, if necessary, to ensure a sanitary condition.

d. A separate overflow with proper air gap could not be confirmed to exist on the Finished Water Reservoir. Furthermore, plant staff were not able to confirm the valves necessary to isolate one half or the other. These items require investigation.

3. R 325.10720 (2)(c) requires continuous turbidimeters be calibrated using the procedure specified by the manufacturer. Recent work on turbidimeters has included calibration with a primary standard, but insufficient records have been maintained for this work. Turbidimeter calibration records have not been kept for some time, resulting in concerns over the accuracy of the data used for compliance. A comprehensive calibration schedule and recordkeeping system must be implemented to reflect calibrations that are conducted according to manufacturer specifications.

4. R 325.10720 (3) requires continuous monitoring for residual disinfectant at an entry point to the distribution system (EPTDS) on a continual basis and requires the minimum to be recorded for each day. The chlorine analyzer at the City's EPTDS was observed to be inoperable during our inspection, resulting in the third violation of this rule since the previous Survey. The chlorine analyzer was confirmed to be operational and reading accurately during a follow-up compliance inspection on October 21, 2021. Minimum levels must be recorded daily, reported to EGLE, and must be trended on SCADA with callout alarms in the event of low residual. Furthermore, a SOP for the maintenance and verification of the instrument must be developed and implemented.

5. R 325.11502 requires a monthly operation report (MOR) be submitted for water systems where treatment is employed. A thorough review of the MOR and the City's process for developing the MOR resulted in several areas of concern:

   a. The City has been verifying disinfection requirements based on an assumption of past operational practices. Plant staff were not familiar with the operational practices for disinfection necessary to achieve sufficient disinfection.

   b. The City has been verifying questions on the MOR related to individual filter effluent (IFE) turbidity triggers required by R 325.10720a, without a thorough review of the data available. Plant staff must verify IFE throughout the month and verify the IFE turbidity trigger questions based on the turbidity data available on SCADA.

   c. The City has been verifying disinfection levels above 0.2 mg/L, as required by R 325.10611a, without referring to results from the continuous chlorine

analyzer at the EPTDS. Minimum residuals for the month must include a review of the continuous analyzer data, which includes water distributed during unattended pumping.

d. The City has not been utilizing the finished water flow meter to accurately report distributed water, as required by R 325.11005. In addition, the finished and raw water meter data are not used to make calculations of chemical dosing, including coagulant, chlorine, and corrosion inhibitor.

e. Water quality parameter (WQP) monitoring has not been collected and reported at the EPTDS, as required by Rule 710b. Specifically, sulfate and conductivity must be conducted every two weeks, at a minimum, at the EPTDS, along with all required parameters.

f. Operational monitoring for chlorine residuals is not being conducted and/or reported in a consistent manner on daily sheets filled out by operators. Clear and concise SOPs are needed, along with a revised daily sheet, to facilitate consistent operational monitoring for free and total chlorine.

g. Sample locations in the distribution system do not provide sufficient coverage of the system. The southwest and northeast areas of the system are not represented in the site selection. Updates to sample siting plans for distribution sampling are needed and must be reviewed and approved by EGLE for adequate system coverage. This includes including total coliform, disinfection byproducts, and water quality parameters.

6. Rule 2102 requires all chemicals intended for use in the treatment process meet ANSI/NSF standard 60. EGLE could not verify the certificate for Sodium Fluoride, packaged by Solvay Fluorides LLC. The City must obtain verification of this chemical's certification, and if a certification cannot be verified, the current product must be discontinued until such time a certified product can be approved.

This significant deficiency begins as of the date of this letter and will continue until the City completes corrective action. The City has the option of establishing a Corrective Action Plan as approved by this office or must complete corrective actions within 120 days of the date of this letter. Please contact this office within 30 days upon receipt of this letter to discuss appropriate corrective action.

Deficiencies:

Deficiencies indicate non-compliance with one or more Act 399 requirements, which include defects in a water system's infrastructure, design, operation, maintenance, or management that cause, or may cause, interruptions to the "multiple barrier" protection

system and adversely affect the system's ability to produce safe and reliable drinking water in adequate quantities.

During the Survey, deficiencies were identified, and are listed below:

1. Observations of the alum day tank room included barrels of unused polymer chemical that requires proper disposal, as well as barrels of spilled alum that also require proper disposal. Spilled chemical that has been recovered cannot be used for treatment as it nullifies the approval under ANSI/NSF 60.

2. R 325.11604 requires notification be made to all customers with known or suspected lead service lines, within 30 days of determining its existence. There is no record of these notifications having been made.

3. Section 2.18 of Recommended Standards requires eye wash stations and fire extinguishers be checked and verified to be functional in the water treatment plant to protect staff during emergencies. These safety items did not appear to be in compliance with this requirement during inspection.

4. Laboratory procedures and quality control checks were found to be deficient in the following:

    a. Records for benchtop turbidimeter calibration were incomplete.

    b. Operations staff do not have written SOPs for laboratory analysis.

    c. An updated Quality Assurance Manual is needed to ensure protocols, policies, and procedures consistent and accurate to produce data of known quality.

    d. Colorimetric methods for analysis are being utilized for many water tests, but secondary checks were not available to verify instrument accuracy.

    e. Manual laboratory analyses should only be utilized when a detailed SOP is implemented to follow an approved analytical method.

    f. The laboratory sink was not in sanitary/clean condition and labels of raw and tap water were not legible.

5. The water plant SCADA and Instrumentation were found to be inadequately functional in the following:

    a. Emergency callout alarm system has limited inputs and only calls one number.

b. Phosphate feed system did not appear on SCADA (scale reading).

c. Filter flows are not accurate on SCADA and on read-outs in the filter gallery.

d. Need verification on the filter effluent control valve programming.

e. Reservoir levels are not reading on SCADA.

f. No headloss information is available on the filters.

g. Alum bulk tank sensors are not functioning.

6. The following are deficiencies relative to chemical treatment and equipment:

   a. Bulk alum tank lids were not in place, and spilled chemicals were prevalent.

   b. Bulk chlorine delivery area should be labeled and needs spill containment.

   c. Alum and chlorine day tanks do not have overflows, and along with the phosphate area show evidence of spilled or leaked chemicals.

   d. The operator in charge was unfamiliar with the fluoride saturator functionality with respect to the connection to a day tank calculation of fluoride added, as reported on the MOR.

   e. The fluoride saturator needs to be fitted with proper containment to catch spills or leaks.

7. Disposal of solid waste from lagoons remains on the water plant property and must be removed to a properly licensed landfill.

8. A SOP was generated to utilize existing filter-to-waste functionality, or where unavailable, to modify the backwash practices to account for lack of filter-to-waste. During the Survey inspection, this SOP was not followed during a demonstration of backwash of Filter 5.

9. Rule 1008 (5) requires a chlorination point immediately following the filters, this was not observed during the Survey inspection.

A plan, schedule, and prioritization for correcting the above deficiencies must be submitted to EGLE as part of the Corrective Action Plan. If you have documentation that any of the items noted above have already been resolved, please provide it to EGLE.

Required Actions:

Required actions identified in the attachment to this Survey are not deficiencies but must be completed by the dates indicated to avoid a future deficiency or significant deficiency designation.

Recommendations:

Recommendations are suggestions the public water supply should consider, to enhance its operations and services, and to avoid future deficiencies. The attached list of recommendations must be given due consideration when conducting improvements to the water system.

EGLE's investigation is considered complete. If you have any information that you would like EGLE to consider regarding the findings in this Survey, please provide it in a written response to this office within 30 days of receipt of this letter.

Please ensure this Survey is shared with all City Commission members. If you have any questions or would like to request a presentation of these findings, please contact me by telephone at 616-307-0261; by e-mail at SarkipatoE@Michigan.gov; or EGLE-DWEHD, 350 Ottawa Avenue NW, Unit 10, Grand Rapids, Michigan 49503.

Sincerely,

Ernest Sarkipato, P.E.
Distribution Engineering Specialist
Engineering Unit
Drinking Water and Environmental Health Division
616-307-0261

Attachments
cc: Berrien County Health Department
Mr. Eric Oswald, Drinking Water and Environmental Health Director, EGLE
Mr. Brian Thurston, Field Operations Section Manager, EGLE
Ms. Kris Philip, Community Water Section Manager, EGLE
Mr. Michael Bolf, Engineering Unit Supervisor, EGLE
cc/att: Mr. Aaron Ward, Drinking Water Unit Supervisor, DHHS
Mr. Abul Ahmed, Operator in Charge, Fleis & VandenBrink Operations
Mr. Rob Jones, Operator in Charge, Fleis & VandenBrink Operations
Mr. Darold Harlan, Fleis & VandenBrink Operations
Mr. Darel Rice, Maintenance Supervisor, City of Benton Harbor

Appendix A

2021 Sanitary Survey Findings & Summary

BENTON HARBOR 2021 SANITARY SURVEY: Significant Deficiencies

Significant deficiencies are serious sanitary deficiencies identified in water systems which include, but are not limited to, defects in design, operation, maintenance, or a failure or malfunction of the sources; treatment, storage, or distribution systems that are determined to be causing, or have the potential to cause, contamination into the public water supply (PWS).

1	**Insufficient technical, managerial, and financial capacity.** Currently the City is conducting a study of alternatives to achieve TMF capacity including a financial analysis, to be completed in February 2022.
2	**No cross connection program and no progress since previous SS.** The City must dedicate a trained staff person to implement this program or obtain a contract with a qualified professional company to implement the program.
3	**Fire Hydrants - no program for flushing, maintenance, repairs.** Lack of working hydrants with sufficient flow is a violation of Rule 1105 and could result in a public safety concern should an emergency occur (i.e., fire). A plan for complete hydrant maintenance must be implemented to restore technical capacity for operation of the water system.
4	**Distribution valves - no program for turning, tracking, may be closed valves in system.** The water system must have sufficient valves in the distribution system to minimize interruptions in service and minimize sanitary hazards during construction or repairs. A comprehensive plan for valve maintenance must be implemented to restore technical capacity for operation of the water system.
5	**Finished water reservoirs missing vent screens, less than 24-inches above grade.** The water plant reservoir vents require corrective action to ensure sanitary condition.
6	**Finished water reservoir hatches need to be water tight and sanitary (shoebox), crumbling concrete.** The water plant reservoir access hatches require corrective action to ensure sanitary condition.
7	**MOR has various inaccuracies, and pre-filled answers to questions on first page.** A thorough review of the MOR and the City's process for developing the MOR resulted in several areas of concern requiring corrective action.
8	**CL17 broken during site inspection, not doing 4 hour grabs, no maintenance or SOP.** Minimum levels must be recorded daily and reported to EGLE and must be trended on SCADA with callout alarms in the event of low residual. Furthermore, an SOP for the maintenance and verification of the instrument must be developed and implemented.
9	**Turbidimeter calibration records not formally kept, staff not trained & no SOP.** A comprehensive calibration schedule and recordkeeping system must be implemented to reflect calibrations that are conducted according to manufacturer specifications.
10	**Water system revenue is insufficient to cover operations, maintenance, and capital costs.** A demonstration of the financial capability of the water system to operate sustainably and in compliance is needed to restore financial capacity.
11	**Evidence of unprotected opening of suction well, on floor of venturi room (plywood w/ tar).** The water plant high service suction well ceiling and access hatch require corrective action to ensure sanitary condition.
12	**Verify treatment chemicals are approved under ANSI/NSF standard 60.** EGLE could not verify the certificate for Sodium Fluoride, packaged by Solvay Fluorides LLC. The City must obtain verification of this chemical's certification, and if a certification cannot be verified the current product must be discontinued until such time a certified product can be approved.

BENTON HARBOR 2021 SANITARY SURVEY: Minor Deficiencies

Deficiencies indicate non-compliance with one or more Act 399 requirements, which include defects in a water system's infrastructure, design, operation, maintenance, or management that cause, or may cause, interruptions to the "multiple barrier" protection system and adversely affect the system's ability to produce safe and reliable drinking water in adequate quantities.

1	Finish water meter is not used to report finished water flow and calculate phosphate dose
2	Filter wash arms were not operable in Filter 5 at the time of the inspection
3	Filters 1 -4 are out of service, improperly abandoned in place (i.e. feed piping)
4	Filters 5, 6, 7, 8 effluent piping is in poor condition, actuators need repair/replacement
5	Raw water screen fed w/ potable water, no protection (cross connection)
6	Records management is deficient in a number of items (inadequate turbidimeter calibration records. No record of disinfection profiling and benchmarking. Do not have previous sanitary survey.
7	Notification of LSL homes not being done
8	Eye wash stations not checked (next to chemical spills), fire extinguishers need checking
9	Very old, nearly imploded polymer barrels are a safety hazard
10	RPZ not tested: chlorine feed water, fluoride, surface wash
11	Benchtop turbidimeter tested w/ Stablcal, but not regularly recorded, standards expiring Nov 21 - Jan 22
12	PO4 not on SCADA - scale, pump status, and needs to have alarm for failure, also not flow-paced as designed to high service meter
13	WQP on plant tap not being monitored at least every two weeks for SO4, conductivity
14	Bulk chlorine delivery area requires labeling and containment
15	Bulk Alum tanks - no overflow, lids are off, very poor condition (piping, valves, pumps), spilled product
16	Removed sludge from lagoon and illegally disposed on WTP property need disposal
17	Filter to waste - not following SOP to meet ACO, shift operator unaware/unwilling
18	No chlorination point immediately following filters (Rule 1008 (5))
19	Fluoride saturator -OIC not familiar with functionality, connection to day tank, no containment
20	Operators could not verify if/how disinfection (C*T) requirements were being met
21	Verify filter effluent valves are programmed to limit flow to rated capacity
22	Filter flow meters need to be maintained and calibrated, displays not working
23	Alum & Chlorine day tanks have no overflow. Both have evidence of spilled/leaking chemical
24	Non-working low service pumps, temporary installation of high service motors indicates a significant lack of maintenance

BENTON HARBOR 2021 SANITARY SURVEY: Required Actions

Required actions identified in this attachment to the Survey are not deficiencies but must be completed by the dates indicated to avoid a future deficiency or significant deficiency designation.

1	Follow the City's capital improvements plan to address critical water system needs
2	Arrange for a professional inspection of the WTP reservoir
3	Verify lagoon discharge location, and any direct connection of WTP discharge piping must be corrected
4	Update General plan and Reliability Study, including model recalibration and updated Asset Management Program. *This is due withing 6 months of the date of the Survey.*
5	Follow an approved Implementation Plan based on findings from the completed TMF study
6	Repair and restore mussel control feed system to prevent plugging of intake pipe
7	Filters 9 & 10 - waste valve actuator needs replacement to bring filters into operation
8	Review contract agreement with F&V Ops to ensure necessary supervisory controls
9	Standard Operating Procedure needed for each lab analysis/method
10	Update Sample Siting Plans for total coliform sampling, DBP, WQP to be representative of distribution system extent
11	Install head loss gages on the filters (design requirement per Ten States Standards)
12	Emergency Response Plan needs to be updated per AWIA requirements
13	Open polymer feed on raw water feed line (room behind raw screen)
14	Reservoir Sensors not working
15	Complete Lead service line replacement at rate of 7% per year
16	Submit a completed DSMI to ELGLE by January 1, 2025 following available guidance
17	Continue to update the Lead and Copper sample siting plan and conduct monitoring in accordance
18	Complete required public education and outreach for any continued action level exceedances
19	Conduct quarterly calculations of Operational Evaluation Level of Disinfection Byproducts, and LRAA

BENTON HARBOR 2021 SANITARY SURVEY: Recommendations

Recommendations are suggestions the public water supply should consider, to enhance its operations and services, and to avoid future deficiencies. The below list of recommendations must be given due consideration when conducting improvements to the water system.

1	Seek alternative to traditional revenue collection methods - payment plans, bill assistance
2	Negotiate higher wages for certified water system operators for better retention
3	Investigate inactive accounts to ensure water use is metered
4	Complete customer meter changeout (500 remain)
5	Some pipes showing corrosion on flanges/bolts/pipe exterior
6	Phosphate chem spill, ruined scale
7	Floor drain flooding next to alum room
8	Sump in basement flooded, inlet pipe is also leaking
9	Sump in chlorine bulk room flooded, alarmed on scada
10	Low service pump 1, 5 is are out of service
11	Cleanout of raw water wet well is overdue
12	Ceiling above raw water wet well has badly peeling paint (into raw?)
13	Extraneous chem feed locations (i.e. old alum feed), leaky overhead chemical feed piping various locations
14	Lagoon management of vegetation is needed
15	Piping paint issues: alum feed (polymer), venturi room (lt. blue, arrows)
16	Chlorine bulk tank has a very rusted flanged fitting - needs addressed
17	Hydraulic oil leaking from door lever on bathroom, safety hazard
18	Air gap drain lines for turbidimeters
19	Carrier water lines for chlorine should have an anti-scalant added
20	Lab sink - very dirty, and labels of raw/tap not legible
21	Uncoated iron pipe on WTP discharge, in chamber next to parking.
22	Trim vegetation back from fencing around WTP
23	Filter flow meters lines are plugged and rusted - need to be replumbed
24	Interconnect policy and practice
25	Calculate Unaccounted for Water (i.e. Lost Water).
26	SOPs needed for water treatment such as rapid mix, flocculation, and chemical addition
27	Investigate low chlorine residual at distribution sample sites, consider sampling stations
28	SOP needed for distribution sampling (wqp, bacti, dbp)
29	SOP needed for lab daily sheets (variability among operators)
30	Need secondary checks for all colorimetric equip. (SO4, PO4, etc)
31	Need laboratory Quality Assurance Manual updated
32	Need a sample location in the south area of town (neighborhood)
33	MOR updates needed. Finished water flow, column headings, etc.
34	Verify chlorine gas detection in bulk room is working
35	Implement work order system for maintenance activities on water system (citiworks)
36	Verification of online turbidimeters should be conducted at least monthly
37	Two CFE locations (40 c.f.r. 141 subpart T), explore options for a single representative location
38	Turbidimeters should be upgraded. Obsolete, plugged line, very long lines delay readings
39	Replace FAS titration for fluoride with ion selective electrode for more accurate testing
40	Floc/Sed building instrumentation needs to be integrated into SCADA
41	Filter media - no plan for assessing/replacement
42	Filters are in poor condition (troughs corroded, failed coatings on wall, cracked concrete in filter structure)
43	Failed coatings on underside of settled water flume in filter pipe gallery

44	VFD on one HSP needed
45	Power management equipment is in need of upgrade (4160), NEED VFD for high service
46	Dark testing of emergency generator needed to confirm functionality of WTP.
47	Install a full-flow drain tap into the Tower Fill Line
48	Alarms on SCADA needed: WTP pressure, cl17, need list
49	Lagoon upgrades needed to allow for easier cleanout
50	Rapid mix at 65%, vary speed to account for raw water cond.
51	Recently added raw turbidimeter - not varying treatment to raw water
52	All/most dehumidifiers appeared to be working - floc/sed experiencing corrosion
53	Alum bulk tank sensors not working
54	interlock alum pumps w/ raw water flow meter
55	Verify fluoride pump is tied to raw water flow meter
56	Filter actuator upgrades or maintenance
57	Calibrate chemical day tank scales
58	Turbidity displays in filter gallery need to be calibrated (4-20mA)
59	Installation of CFE online turbidimeter would offer compliance benefits
60	Chlorine pump not on SCADA for overfeed protection, leak detection
61	Ensure adequate inventory of treatment chemicals and laboratory chemicals
62	Verify "overflow" on pump suction well - rule out cross connection
63	Follow up on low chlorine sample sites in distribution - new service line?
64	Fluoride saturator should have forced air ventilation
65	Verify status of isolation valves to clarifiers (ideally would cut/cap)
66	Need backup po4 pumps - integrate to flow meter
67	Investigate efficacy of chlorine application in sed basin (noted bubbling)
68	Need to calibrate flow meters (finished water, raw water)
69	Hypochlorite day tanks do not have overflow, site tubes not clear, not clean
70	DR300 only measures up to 3.0 mg/L PO4
71	Properly abandon the Grand Boulevard Pumping Station, address buried hydrant
72	Emergency call-out system upgrades to enable multiple callouts and more inputs
73	Investigate badly corroded bulkhead outside the exit door at the east end of the filter pipe gallery (leaking)
74	Replace security fencing around elevated tank site.
75	Investigate the ability to isolate each half of the finished water reservoir
76	Unknown drain line observed to be discharging into raw water suction well during inspection
77	Sludge drain valve for south settling basin out of service
78	Investigate areas of water infiltrating interior of water plant (window wells in pump gallery, east end walkway, multiple roof leaks)
79	Secure metal facia above lettering at west entrance to water plant (safety issue)
80	Install entry door to elevated storage tank pipe piping vault that is properly enclosed and secure.

Sanitary Survey of Benton Harbor Water Supply - Review Summary

Water Supply: Benton Harbor | WSSN: 00600
County: Berrien | District: 93
Evaluator: Ernie Sarkipato, Michael Bolf | Date: 10/29/2021

Category	Comment	N/A	NotEv	NoD/R	Rec	Def	SigDef
Source					X		
Construction & Maintenance	*Install working mussel control feed system*				X		
Standby Power				X			
Isolation				X			
Source Water Protection				X			
Capacity				X			
Treatment							X
Disinfection	*Bulk delivery area improvements, day tank impr.*					X	
Fluoride	*Verify NSF, Day tank connection, no containment*						X
Phosphate Addition	*Flow-pace phosphate pump to HS flow meter*					X	
Softening		X					
Iron/Manganese Removal		X					
Arsenic Removal		X					
Pretreatment	*Develop coagulation model for sourcewater changes*				X		
Filtration (gravity or membranes)	*Filters 9-10 out of service, Filter 5 wash arms, etc.*					X	
C*T	*Operator not verifying CT calculations*					X	
Other	*SCADA and instrumentation requires upgrades*					X	
Distribution System							X
Interconnections w/ Other WS	*Develop formal agreement, Study water quality*				X		
Hydrants & Valves	*No maintenance program, lack of functionality*						X
Service Lines & Metering	*Replace LSL, continue meter changeout*				X		
General Plan	*Update to general plan required in 6 months*				X		
Cross Connections	*Program to prevent cross connections is defunct*						X
Construction & Maintenance	*Unsanitary conditions of WTP storage tanks*						X
Capacity				X			
Finished Water Storage							X
Construction & Maintenance	*Access hatches & air vents must be sanitary*						X
Controls	*Level indicators on reservoirs not working*					X	
Capacity				X			
Pumps (All Pumping Facilities)						X	
Construction & Maintenance	*Non-working Low Service, temporary high service*					X	
Controls				X			
Capacity	*recommend permanent VFD for high service*				X		
Monitoring & Reporting							X
Bacteriological Monitoring	*Update SSP with current contact information*				X		
Chemical Monitoring	*Non-working chlorine analyzer at entry point to dist.*						X
MOR or Annual Pumpage Report	*Inaccurate reporting of CT, IFE turbidity, flows*						X
Consumer Confidence Report				X			
Analytical Capabilities	*Lack of SOP, quality control checks for lab methods*						X
System Management & Operations							X
Owner Responsibility	*Lack of TMF capacity is identified*						X
Capacity Development	*Records management is lacking*					X	
Reliability Study	*Update to reliability study needed*				X		
Operations Oversight	*Review operations contract to ensure oversight*				X		
Permits				X			
Operator Compliance					X		
Operator Certification	*Review contract with FVOps to ensure oversight*				X		
Technical Knowledge & Training	*Implementation of SOPs requires operator training*				X		
Security					X		
Emergency Response Plan	*Requires updating per AWIA*				X		
Site Security (Fences, Alarms...)	*Clear vegetation from fencing around WTP*			X			
Financial							X
Rates	*Implement alternate payment options*				X		
Budget & Capital Imp. Plan	*Revenue is insufficient to cover operation of system*						X
Other	*Eyewash stations and fire extinguishers not updated*					X	

N/A - Not Applicable
NotEv - Not Evaluated
Rec - Recommendations Made
Def - Deficiencies Identified
SigDef - Significant Deficiencies Identified

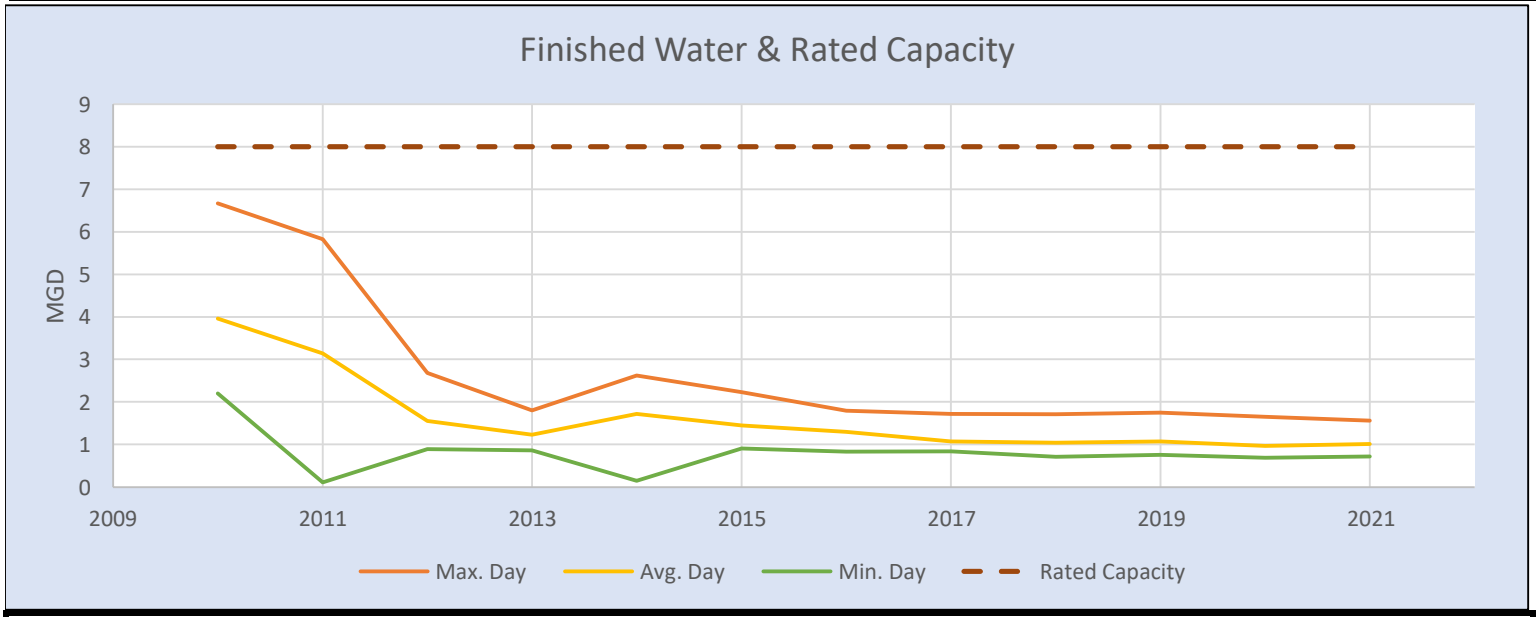
Appendix B

2021 Sanitary Survey Water System Demand Analysis

Water Supply: Benton Harbor WSSN: 00600

Demand & Capacity - City of Benton Harbor, 2021 Sanitary Survey

Year	Pumpage (Million Gallons Per Date, MGD)					
	Avg. Day	Date of Max.	Max. Day	Min. Day		
2010	3.960		6.670	2.200		
2011	3.140		5.830	0.110		
2012	1.550		2.680	0.890		
2013	1.230		1.800	0.860		
2014	1.720		2.620	0.150		
2015	1.450		2.230	0.905		
2016	1.300		1.790	0.834		
2017	1.070		1.720	0.840		
2018	1.040		1.710	0.710		
2019	1.070		1.744	0.755		
2020	0.967		1.650	0.690		
2021	1.011		1.565	0.720	(data through September 2021)	



5-Year Max. Day	1.790	MGD	
10-Year Max. Day	6.670	MGD	(includes previous wholesale cust.)
5-Year Avg. Day	1.032	MGD	
Baseline Capacity	0	gpm	0.000 MGD
Rated Capacity	5,552	gpm	8.000 MGD
Firm Well Capacity		gpm	MGD
Max. Day/Rated Capacity	**22%**		

Comments/References:

-Finished water pumping has not been reported based on meter readings, but rather an estimate of water distributed based on changes in the finished water reservoir levels.

-Downward trend in demands is representative of loss of wholesale customer.

-Rated Capacity assumes working filters: 5-6, 7-8, 9-10, 11-12, rating of 8 MGD determined during 2018 survey

-Given a rated capacity of 8 MGD, the water system appears to have sufficient capacity to meet demands since the loss of wholesale customer around 2012.

Appendix C

2021 Sanitary Survey Water System Sample Siting Plans

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May 6 2021
EGLE-DWEHD-CWSS-LCU

F&V operations
and resource management

WSSN 0600

The City of Benton Harbor and F&V Operations and Resource Management are submitting the following report(s) to Michigan Department of Environment, Great Lakes and Energy:

LCR Sample site plan

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons or persons who manage the system or those persons directly responsible for gathering such information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

F&V Operations Representative: Robert Jones

Signature: _____ Date: 5/6/21

RECEIVED
May 6 2021
EGLE-DWEHD-CWSS-LCU

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
DRINKING WATER AND ENVIRONMENTAL HEALTH DIVISION

SAMPLING PLAN – LEAD AND COPPER

Issued under authority of the Michigan Safe Drinking Water Act, 1976 PA 399, and Administrative Rules, as amended. Administrative Rule R 325.10710a requires a water supply to monitor for lead and copper according to a pool of targeted sampling sites in accordance with designated site selection criteria. Complete and submit this form to EGLE.

Water Supply Information

Benton Harbor Supply Name	0600 WSSN
601 N Ridgeway Ct Address	Berrien County
St Joseph, MI 49085 City, State, Zip	9843 Population Served

Contacts – Water Supply

Robert Jones Name and Title	rjones@fv-operations.com E-mail	8102209441 Telephone
Darold Harlan Name and Title	dharland@fv-operations.com E-mail	2602245578 Telephone
Catherine Winn Name and Title	cwinn@fv-operations.com E-mail	5173043513 Telephone

Contacts – EGLE and Other

Mr. Tyler Postma Lead and Copper Rule Analyst 517-388-1833 PostmaT@Michigan.gov	Ms. Aislinn Deely Lead and Copper Rule Analyst 517-388-1816 DeelyA@Michigan.gov	Ms. Heather Jackson Lead and Copper Rule Analyst 517-242-3997 JacksonH@Michigan.gov

EGLE Lead and Copper Contacts

EGLE Drinking Water District Analyst Name	E-mail	Telephone
Earnie Sarkipatoe EGLE Drinking Water District Engineer Name	sarkipatoee@michigan.gov E-mail	6163070261 Telephone
Pollution Emergency Alerting System Information (PEAS) Call PEAS number if unable to contact EGLE staff		800-292-4706 Telephone
Local Official	E-mail	Telephone
Local Official	E-mail	Telephone
Health Department	E-mail	Telephone

Public Advisory, Education, and Notification

Means of Distributing Information to the Public

Newspaper Name and City	E-mail	Telephone
Radio/Television Name and Address or City	E-mail	Telephone

Date Cover Sheet Updated

MICHIGAN COMMUNITY WATER SUPPLY LEAD AND COPPER TAP SAMPLING PLAN

>>> REVIEW INSTRUCTIONS ON PAGES 4 AND 5 BEFORE COMPLETING FORM BELOW <<<

WSSN: ____0600_____ Supply Name: __Benton Harbor_____

Page _____ of _____

Standard Number of Sites Required: __60_____ Reduced Number of Sites Required: 30

Site No.	Address	Tier Level	Category	Structure Type	Service Line Material	Interior Plumbing Material	Site Validation Method
00	*Ex: 0000 Any Street – Any Town, MI*	*1*	*A*	*SFR*	*L*	*C*	*Visual*
01	SEE ATTACHED						
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Use next page to record additional sampling sites.

Plan Completed By

___Robert Jones_____ _____
Name Signature

___Operator_____ _5/6/21_____
Title Date

Lead Copper Sampling Site Plan
Benton Harbor WSSN 0600

SiteNo.	Address	Tier Level	Category	Structure Type	Service Line Material	Interior Plumbing Material	Site Validation Method
1	1022 HURD	1	A	SFR	Lead		Pilot Program
2	1047 HURD	1	A	SFR	Lead		Pilot Program
3	1057 MONROE	1	A	SFR	Lead		Pilot Program
4	1084 SALEM	1	A	SFR	Lead		Pilot Program
5	1088 OGDEN	1	A	SFR	Lead		Pilot Program
6	1118 BROADWAY	1	A	SFR	Lead		Pilot Program
7	1137 HURD	1	A	SFR	Lead		Pilot Program
8	1138 JENNINGS	1	A	SFR	Lead		Pilot Program
9	114 MCCORD	1	A	SFR	Lead		Pilot Program
10	1165 HANNAH	1	A	SFR	Lead		Pilot Program
11	1198 JENNINGS	1	A	SFR	Lead		Pilot Program
12	1251 SUPERIOR	1	A	SFR	Lead		Pilot Program
13	1267 SUPERIOR	1	A	SFR	Lead		Pilot Program
14	127 SEARLES	1	A	SFR	Lead		Pilot Program
15	1274 OGDEN	1	A	SFR	Lead		Pilot Program
16	140 BENTON	1	A	SFR	Lead		Pilot Program
17	141 SEELEY	1	A	SFR	Lead		Pilot Program
18	142 SEARLES	1	A	SFR	Lead		Pilot Program
19	150 PARKER	1	A	SFR	Lead		Pilot Program
20	191 SEARLES	1	A	SFR	Lead		Pilot Program
21	208 SEELEY	1	A	SFR	Lead		Pilot Program
22	261 SEARLES	1	A	SFR	Lead		Pilot Program
23	265 SEARLES	1	A	SFR	Lead		Pilot Program
24	277 HASTINGS	1	A	SFR	Lead		Pilot Program
25	366 MCCORD	1	A	SFR	Lead		Pilot Program
26	446 PACKARD	1	A	SFR	Lead		Pilot Program
27	463 FOSTER	1	A	SFR	Lead		Pilot Program
28	487 BRITAIN	1	A	SFR	Lead		Pilot Program

29	534 E MAIN	1	A	SFR	Lead		Pilot Program
30	566 TERRITORIAL	1	A	SFR	Lead		Pilot Program
31	582 PEARL	1	A	SFR	Lead		Pilot Program
32	596 CASS	1	A	SFR	Lead		Pilot Program
33	644 SUPERIOR	1	A	SFR	Lead		Pilot Program
34	663 THRESHER	1	A	SFR	Lead		Pilot Program
35	711 BUSS	1	A	SFR	Lead		Pilot Program
36	718 TERRITORIAL	1	A	SFR	Lead		Pilot Program
37	732 MCALISTER	1	A	SFR	Lead		Pilot Program
38	753 BROADWAY	1	A	SFR	Lead		Pilot Program
39	754 LAVETTE	1	A	SFR	Lead		Pilot Program
40	759 BUSS	1	A	SFR	Lead		Pilot Program
41	759 OGDEN	1	A	SFR	Lead		Pilot Program
42	776 MONROE	1	A	SFR	Lead		Pilot Program
43	789 THRESHER	1	A	SFR	Lead		Pilot Program
44	792 BRITAIN	1	A	SFR	Lead		Pilot Program
45	797 WAUCEDA	1	A	SFR	Lead		Pilot Program
46	806 LASALLE	1	A	SFR	Lead		Pilot Program
47	807 HIGH	1	A	SFR	Lead		Pilot Program
48	810 NATHANIEL WELLS	1	A	SFR	Lead		Pilot Program
49	815 PITKIN	1	A	SFR	Lead		Pilot Program
50	817 NATHANIEL WELLS	1	A	SFR	Lead		Pilot Program
51	830 BROADWAY	1	A	SFR	Lead		Pilot Program
52	831 BRITAIN	1	A	SFR	Lead		Pilot Program
53	836 HIGHLAND	1	A	SFR	Lead		Pilot Program
54	840 THRESHER	1	A	SFR	Lead		Pilot Program
55	846 BRITAIN	1	A	SFR	Lead		Pilot Program
56	846 EDGECUMBE	1	A	SFR	Lead		Pilot Program
57	846 MCALISTER	1	A	SFR	Lead		Pilot Program
58	853 VINEYARD	1	A	SFR	Lead		Pilot Program
59	860 PITKIN	1	A	SFR	Lead		Pilot Program
60	864 HIGHLAND	1	A	SFR	Lead		Pilot Program
61	868 MINERAL	1	A	SFR	Lead		Pilot Program
62	870 OGDEN	1	A	SFR	Lead		Pilot Program

63	875 MCGUIGAN	1	A	SFR	Lead		Pilot Program
64	932 SUPERIOR	1	A	SFR	Lead		Pilot Program
65	946 BISHOP	1	A	SFR	Lead		Pilot Program
66	964 MCALISTER	1	A	SFR	Lead		Pilot Program
67	1292 Bishop	1	A	SFR	Lead		Records/previous site
68	931 Monroe	1	A	SFR	Lead		Records/previous site
69	1129 Jennings	1	A	SFR	Lead		Records/previous site
70	1354 Bishop	1	A	SFR	Lead		Records/previous site
71	948 Ogden	1	A	SFR	Lead		Records/previous site
72	1133 Jennings	1	A	SFR	Lead		Records/previous site
73	1248 Broadway	1	A	SFR	Lead		Records/previous site
74	1026 Bishop	1	A	SFR	Lead		Records/previous site
75	1271 Pavone	1	A	SFR	Lead		Records/previous site
76	1259 Bishop	1	A	SFR	Lead		Records/previous site
77	285 Hastings	1	A	SFR	Lead		Records/previous site
78	1086 Superior	1	A	SFR	Lead		Records/previous site
79	174 Hastings	1	A	SFR	Lead		Records/previous site
80	649 Pipestone	1	A	SFR	Lead		Records/previous site
81	1112 Agard	1	A	SFR	Lead		Records/previous site
82	1053 Jennings	1	A	SFR	Lead		Records/previous site
83	1020 Bishop	1	A	SFR	Lead		Records/previous site
84	1251 Columbus	1	A	SFR	Lead		Records/previous site
85	142 Cross St.	1	A	SFR	Lead		Records/previous site
86	885 Mineral	1	A	SFR	Lead		Records/previous site
87	1110 Ogden	1	A	SFR	Lead		Records/previous site
88	781 Buss	1	A	SFR	Lead		Records/previous site
89	610 Superior	1	A	SFR	Lead		Records/previous site
90	1124 Colfax	1	A	SFR	Lead		Records/previous site
91	1016 LaVette	1	A	SFR	Lead		Records/previous site
92	1197 Agard	1	A	SFR	Lead		Records/previous site
93	999 Pearl St	1	A	SFR	Lead		Records/previous site
94	1178 Broadway	1	A	SFR	Lead		Records/previous site
95	857 Ogden	1	A	SFR	Lead		Records/previous site
96	141 Winan	1	A	SFR	Lead		Records/previous site

97	768 Broadway	1	A	SFR	Lead		Records/previous site
98	812 Lavette	1	A	SFR	Lead		Records/previous site
99	1264 Pavone	1	A	SFR	Lead		Records/previous site
100	166 Searles	1	A	SFR	Lead		Records/previous site
101	819 Vineyard	1	A	SFR	Lead		Records/previous site
102	1237 Columbus	1	A	SFR	Lead		Records/previous site
103	1115 Superior	1	A	SFR	Lead		Records/previous site
104	578 Edwards	1	A	SFR	Lead		Records/previous site
105	341 Brunson	1	A	SFR	Lead		Records/previous site
106	1011 Pearl St	1	A	SFR	Lead		Records/previous site
107	1191 Pavone	1	A	SFR	Lead		Records/previous site
108	1069 Hurd	1	A	SFR	Lead		Records/previous site
109	1225 Colfax	1	A	SFR	Lead		Records/previous site
110	1289 Bishop	1	A	SFR	Lead		Records/previous site
111	1291 Superior St	1	A	SFR	Lead		Records/previous site
112	1244 Jennings	1	A	SFR	Lead		Records/previous site
113	185 Parker Ave	1	A	SFR	Lead		Records/previous site
114	1161 Union St	1	A	SFR	Lead		Records/previous site
115	504 Territorial Rd	1	A	SFR	Lead		Records/previous site
116	552 Buena Vista	1	A	SFR	Lead		Records/previous site
117	1143 Union	1	A	SFR	Lead		Records/previous site
118	854 LaSalle St	1	A	SFR	Lead		Records/previous site
119	232 Hastings Ave	1	A	SFR	Lead		Records/previous site
120	201 Garfield	1	A	SFR	Lead		Records/previous site
121	400 John Street	1	A	SFR	Lead		Records/previous site
122	204 Garfield	1	A	SFR	Lead		Records/previous site
123	1043 Agard	1	A	SFR	Lead		Records/previous site
124	1037 Pearl	1	A	SFR	Lead		Records/previous site
125	582 Niles	1	A	SFR	Lead		Records/previous site
126	660 McGuigan	1	A	SFR	Lead		Records/previous site
127	1167 Broadway	1	A	SFR	Lead		Records/previous site
128	1066 Monroe	1	A	SFR	Lead		Records/previous site
129	855 Lavette	1	A	SFR	Lead		Records/previous site
130	565 Clay	1	A	SFR	Lead		Records/previous site

131	1212 Pearl St	1	A	SFR	Lead		Records/previous site
132	161 Kline	1	A	SFR	Lead		Records/previous site
133	538 Columbus	1	A	SFR	Lead		Records/previous site

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE

SAMPLE SITING PLAN - BACTERIOLOGICAL

Issued under authority of 1976 PA 399 and Administrative Rules, as amended. Administrative Rule R 325.10704c requires a water supply to monitor for total coliform bacteria according to a written sample siting plan subject to department review and revision. This form is provided as a convenience to the water supply to develop the plan.

Water Supply Information

City of Benton Harbor Supply Name	0600 WSSN
601 Ridgeway Address	< 10,000 Population Served
St Joseph, MI 49085 City, State, Zip	Berrien County

Contacts – Water Supply

Jay Ouzts / Operations Supervisor Name/Title	jouzts@fv-operations.com E-mail	(616) 204-5967 Telephone
Darwin Watson / City Manager Name/Title	dwatson@cityofbentonharbormi.gov E-mail	(269) 927-8457 Telephone
/ Name/Title	 E-mail	( ) Telephone

Contacts – DEQ and Other

Heather Bishop DEQ Drinking Water Analyst Name	BishopH@michigan.gov E-mail	(269)-330-9153 Telephone
Gary Wozniak DEQ Drinking Water District Engineer Name	WOZNIAKG@michigan.gov E-mail	(269)-491-3107 Telephone
Pollution Emergency Alerting System Information (PEAS) Call PEAS number if unable to contact DEQ staff.		1-800-292-4706 Telephone
Darwin Watson Local Official	dwatson@cityofbentonharbormi.gov E-mail	(269) 927-8457 Telephone
 Local Official	 E-mail	 Telephone
Berrien County Health Department Health Department	 E-mail	(269) 926-7121 Telephone

Public Notification

Newspaper Release
Means of Public Notification

The Herald Palladium Newspaper Name and City	localnews@thehp.com E-mail	(269) 429-4398 Telephone
WAUS 90.7 Radio/Television Name and Address or City	waus@andrews.edu E-mail	(269) 471-3400 Telephone

This Cover Sheet Updated

5/11/2016
Date

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MICH. DEPT. OF ENVIRONMENTAL QUALITY
JUN 06 2016
KAL RESOURCE MANAGEMENT GROUP

Bacteriological Sampling Requirements Collect at least **2** routine samples per month from each of the routine sites listed for a total of **10** samples per month. For a chlorinated system, measure and record the chlorine residual at the same time and place as every routine and repeat sample collected. Results from all routine and repeat sites are used to determine compliance. Results from other sites might not be allowed for compliance.

Distribution System Sample Sites

Dist. Site #	Routine Site Address	# of samples per month	Upstream Site Address*	Downstream Site Address*	Site Code of All Sources That Serve The Routine Site * (Not required for surface water supplies)
1	City Hall, 200 East Wall Street	2	Cornerstone Alliance, 38 West Wall Street	Harbor Towers, 250 East Wall Street	N/A
2	Cornerstone Building, 38 West Wall Street	2	Wall Street Antiques, 74 West Wall Street	City Hall, 200 East Wall Street	N/A
3	Wolf's Marine, 250 West Main Street	2	Comcast, 206 West Main Street	King Kong Express, 325 West Main Street	N/A
4	Citgo Gas Station, 470 West Main Street	2	Mosaic Café, 510 West Main Street	Jerry Hunts Auto Repair, 440 West Main Street	N/A
5	Sunny Spot, 895 Pipestone	2	Shear Elegance, 858 Pipestone	Boost Mobile, 957 Pipestone	N/A

* When a routine sample is positive for total coliform or *E.coli*, collect samples from repeat sites in the distribution system. Groundwater supplies must also sample all raw water sources (wells) for each positive routine sample result. With DEQ approval, source water collection may be limited to those wells that were in use at anytime within the 72-hour period prior to the collection of the routine positive sample. Supplies that purchase their source water must notify their supplier of water within 24 hours of a positive routine sample result. Surface water supplies are not required to sample their source water.

Source Sample Sites* and Other Non-distribution Sites (raw water, common header, entry point aka plant tap)

Site Code	Well # or Other Designation	Location or Address

Comments:
Surface Water, Lake Michigan

* All sources **MUST** be sampled if a routine distribution sample is positive for total coliform or *E. coli*.

Laboratory Certified to Analyze Bacteriological Samples - for more labs certified in total coliform, visit http://www.michigan.gov/deqlab.

Laboratory Name - Primary	Address, City, State, Zip	E-mail	Telephone
City of Benton Harbor			(269) 927-8471
Great Lakes Scientific, Inc.			(269) 429-1000

Plan Completed/Updated and Reviewed

Jay Ouzts
Name

5/11/2016
Date Completed

0210
WSSN

Andrews University
Water Supply Name

Berrien
County

For DEQ Use Only
Sample site plan reviewed by DEQ.
☒ No revisions necessary.
☐ Revisions necessary. Contact DEQ.

DEQ Staff: BISHOP
Date: 6-6-2016

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE

SAMPLE SITING PLAN - BACTERIOLOGICAL

Issued under authority of 1976 PA 399 and Administrative Rules, as amended. Administrative Rule R 325.10704c requires a water supply to monitor for total coliform bacteria according to a written sample siting plan subject to department review and revision. This form is provided as a convenience to the water supply to develop the plan.

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City of Benton Harbor Supply Name	0600 WSSN
601 Ridgeway Address	< 10,000 Population Served
St Joseph, MI 49085 City, State, Zip	Berrien County

Contacts – Water Supply

Jay Ouzts / Operations Supervisor Name/Title	jouzts@fv-operations.com E-mail	(616) 204-5967 Telephone
Darwin Watson / City Manager Name/Title	 E-mail	(269) 927-8457 Telephone
/ Name/Title	 E-mail	( ) Telephone

Contacts – DEQ and Other

~~Jeremy Klein~~ Heather Bishop DEQ Drinking Water Analyst Name	bishoph@michigan.gov E-mail	269-330-9153 ~~(269) 567-3613~~ Telephone
Gary Wozniak DEQ Drinking Water District Engineer Name	WOZNIAKG@michigan.gov E-mail	~~(269) 567-3613~~ 269-491-3107 Telephone
Pollution Emergency Alerting System Information (PEAS) Call PEAS number if unable to contact DEQ staff.		1-800-292-4706 Telephone
Darwin Watson Local Official	dwatson@cityofbentonharbormi.gov E-mail	(240) 727-6033 Telephone
 Local Official	 E-mail	 Telephone
Berrien County Health Department Health Department	 E-mail	(269) 926-7121 Telephone

Public Notification

Newspaper Release
Means of Public Notification

The Herald Palladium Newspaper Name and City	localnews@thehp.com E-mail	(269) 429-4398 Telephone
WAUS 90.7 Radio/Television Name and Address or City	waus@andrews.edu E-mail	(269) 471-3400 Telephone

This Cover Sheet Updated

5/11/2016
Date

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MICH. DEPT. OF ENVIRONMENTAL QUALITY
MAY 13 2016
RESOURCE MANAGEMENT GROUP
KALAMAZOO DISTRICT OFFICE

Bacteriological Sampling Requirements Collect at least _____ routine samples per month from the routine sites listed. For a chlorinated system, measure and record the chlorine residual at the same time and place as every routine and repeat sample collected. Results from all routine and repeat sites are used to determine compliance. Results from other sites might not be allowed for compliance.

Distribution System Sample Sites

Dist. Site #	Routine Site Address	# of samples per month	Upstream Site Address*	Downstream Site Address*	Site Code of All Sources That Serve The Routine Site * (Not required for surface water supplies)
1	City Hall, 200 East Wall Street	1	Cornerstone Alliance, 38 West Wall Street	Harbor Towers, 250 East Wall Street	N/A
2	Cornerstone Building, 38 West Wall Street	1	Wall Street Antiques, 74 West Wall Street	City Hall, 200 East Wall Street	N/A
3	Wolf's Marine, 250 West Main Street	1	Comcast, 206 West Main Street	King Kong Express, 325 West Main Street	N/A
4	Citgo Gas Station, 470 West Main Street	1	Mosaic Café, 510 West Main Street	Jerry Hunts Auto Repair, 440 West Main Street	N/A
5	Sunny Spot, 895 Pipestone	1	Shear Elegance, 858 Pipestone	Boost Mobile, 957 Pipestone	N/A

* When a routine sample is positive for total coliform or *E.coli*, collect samples from repeat sites in the distribution system. Groundwater supplies must also sample all raw water sources (wells) for each positive routine sample result. With DEQ approval, source water collection may be limited to those wells that were in use at anytime within the 72-hour period prior to the collection of the routine positive sample. Supplies that purchase their source water must notify their supplier of water within 24 hours of a positive routine sample result. Surface water supplies are not required to sample their source water.

Source Sample Sites* and Other Non-distribution Sites (raw water, common header, entry point aka plant tap)

Site Code	Well # or Other Designation	Location or Address

Comments:
Surface Water, Lake Michigan

* All sources **MUST** be sampled if a routine distribution sample is positive for total coliform or *E. coli.*

Laboratory Certified to Analyze Bacteriological Samples - for more labs certified in total coliform, visit http://www.michigan.gov/deqlab.

Laboratory Name - Primary	Address, City, State, Zip	E-mail	Telephone
City of Benton Harbor			(269) 927-8471
Great Lakes Scientific, Inc.			(269) 429-1000

Plan Completed/Updated and Reviewed

Name	Date Completed
Jay Ouzts	5/11/2016

WSSN	Water Supply Name	County
0210	Andrews University	Berrien

For DEQ Use Only
Sample site plan reviewed by DEQ.
☐ No revisions necessary.
☒ Revisions necessary. Contact DEQ.

DEQ Staff: H. BISHOP
Date: 6-6-2016

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE

MONITORING PLAN FOR COMMUNITY WATER SUPPLIES – DISINFECTANTS AND DISINFECTION BYPRODUCTS (DDBP)

Issued under authority of 1976 PA 399 and Administrative Rules, as amended. Administrative Rule R 325.10719i requires a water supply to develop a monitoring plan. This form is provided as a convenience to the water supply to develop the plan.

Water Supply Information

City of Benton Harbor Supply Name	00600 WSSN
601 Ridgeway Drive Address	11,000 Population Served
St. Joseph, MI 49085 City, State, Zip	Berrien County

Contacts – Water Supply

Stewart A. Beach Assistant Utilities Director Name and Title	sbeach@cityofbentonharbormi.gov E-mail	(927) 8471 Telephone
Darwin Watson DPW Director Name and Title	dwatson@cityofbentonharbormi.gov E-mail	(927) 8400 Telephone
 Name and Title	 E-mail	( ) Telephone

Contacts – DEQ and Other

Katelyn Pomaville DEQ Drinking Water Analyst Name	pomavillek@michigan.gov E-mail	(269) 567-3612 Telephone
Gary Wozniak DEQ Drinking Water District Engineer Name	wozniakg@michigan.gov E-mail	(269) 567-3613 Telephone
Pollution Emergency Alerting System Information (PEAS) Call PEAS number if unable to contact DEQ staff.		1-800-292-4706 Telephone
 Local Official	 E-mail	( ) Telephone
 Local Official	 E-mail	( ) Telephone
Ken Priest Health Department	kpriest@bchdmi.org E-mail	(269) 927-5617 Telephone

Public Notification

Website Means of Public Notification		
Herald Palladium Newspaper Name and City	thartzell@TheH-P,com E-mail	(269) 429-1293 Telephone
 Radio/Television Name and Address or City	 E-mail	( ) Telephone

Laboratory

State of Michigan Primary Laboratory Name	 E-mail	( ) Telephone
Lansing, MI Primary Lab Address, City, State, Zip		
 Alternate Laboratory Name	 E-mail	( ) Telephone
 Alternate Lab Address, City, State, Zip		

RECEIVED
MICH. DEPT. OF NATURAL RESOURCES AND ENVIRONMENT
AUG 22 2013
ENVIRONMENTAL RESOURCE MANAGEMENT DIVISION
KALAMAZOO DISTRICT OFFICE

DEPARTMENT OF NATURAL RESOURCE & ENVIRONMENT
ENVIRONMENT RESOURCE MANAGEMENT DIVISION
EXAMINED AND APPROVED
By: Katelyn Pomaville
Date: 8/28/13

Measure Chlorine Residual (under normal operating conditions)

☒ Check if this supply serves water disinfected with chlorine or chloramines. The residual disinfectant level must be measured at the same time and the same location as each total coliform compliance sample (includes all routine AND repeat total coliform samples).

Monitor Total Trihalomethanes (TTHM) and Haloacetic Acids (HAA5)

TTHM and HAA5 Sample Sites and Monitoring Frequency

Site Code[1] (DBP1, DBP2, etc)	Sample Site Address	Rationale for Selection	ROUTINE Monitoring Sample Every ☐ 3rd Month ☐ 1 Year	REDUCED Monitoring[2] Sample Every ☒ 3rd Month ☐ 1 Year ☐ 3rd Year
DBP1	Bluewater Terminal (S. Fair and Valley Drive)	Stage 1 Site	☐ TTHM ☐ HAA5	☒ TTHM ☒ HAA5
DBP2	B&Z Construction Milton St.	Highest IDSE TTHM LRAA	☐ TTHM ☐ HAA5	☒ TTHM ☒ HAA5
DBP__			☐ TTHM ☐ HAA5	☐ TTHM ☐ HAA5
DBP__			☐ TTHM ☐ HAA5	☐ TTHM ☐ HAA5
DBP__			☐ TTHM ☐ HAA5	☐ TTHM ☐ HAA5
DBP__			☐ TTHM ☐ HAA5	☐ TTHM ☐ HAA5

[1] Each Site Code is unique to a Sample Site Address. Contact the DEQ if a sample site is no longer available. The DEQ will help you select a new Sample Site Address and establish a new Site Code.

[2] Reduced monitoring can only be established after certain criteria are met. Complete this column only after consultation with the DEQ. Monitor according to the routine schedule unless a reduced schedule has been approved by the DEQ.

Peak historic month: August (month of highest byproduct formation, based on past results)

When monitoring:

- Every 1 year or every 3rd year, monitor during the peak historic month.

- Every 3rd month, check the group below that contains the peak historic month. Monitor during each of the months in the group.
  - ☐ January, April, July, and October (1st month of each calendar quarter)
  - ☒ February, May, August, and November (2nd month of each calendar quarter)
  - ☐ March, June, September, and December (3rd month of each calendar quarter)

Monitor Bromate (under normal operating conditions)

☐ Check if this supply adds ozone. This supply must collect 1 sample per month for bromate at the entry point (plant tap) of each treatment plant that uses ozone. The DEQ may reduce frequency from monthly to quarterly if the bromate running annual average (RAA) is <= 0.0025 mg/L (milligrams per liter) (2.5 parts per billion [ppb]).

Schematic (optional)

☐ Check if a schematic is attached showing the sample sites in this monitoring plan.

TTHM and HAA5 Operational Evaluation

This supply must conduct an operational evaluation if either the TTHM or the HAA5 Operational Evaluation Level (OEL) exceeds the maximum contaminant level (MCL). This supply must submit the written report to the DEQ district office within 90 days after learning the result that causes the OEL to exceed the MCL. The OEL is an estimate of the following quarter's locational running annual average (LRAAs). OEL = 2 previous quarters results + twice the current quarter result, all divided by 4.

TTHM and HAA5 Increased Monitoring

A supply monitoring every year or every 3rd year that has any TTHM or HAA5 result above the MCL must begin collecting dual sample sets every 3rd month at all routine sites. Compliance with the MCL will be determined at the end of four consecutive quarters, including the quarter that triggered increased monitoring.

Sample Site Plan Completed By

Stewart A Beach	Assistant Utilties Director	8-22-2013
Name	Title	Date
Signature	sbeach@cityofbentonharbormi.gov	(269) 927-8471
	E-mail	Telephone
City of Benton Harbor	Berrien	0600
Water Supply Name	County	WSSN

Compliance Calculation Procedures

See page 4 of this plan.

Compliance Calculation Procedure

General

Where compliance is based on an RAA of monthly or quarterly samples or averages and the supply fails to monitor for TTHM, HAA5, or bromate, this failure will be treated as a monitoring violation for the entire period covered by the RAA.

All samples taken and analyzed from compliance sites must be included in determining compliance, even if that number is greater than the minimum required.

If any individual quarter's average will cause the RAA of that supply to exceed the MCL, the supply is out of compliance at the end of that quarter.

Chlorine

Chlorine maximum residual disinfectant level (MRDL) is 4.0 mg/L.

Compliance with the MRDL is based on an RAA, computed quarterly, of monthly averages of all measurements taken at the same place and time as total coliform compliance samples.

In cases where supplies switch between the use of chlorine and chloramines during the year, compliance will be based on all monitoring results of both chlorine and chloramines.

TTHM and HAA5

TTHM MCL is 0.080mg/L (80 ppb). HAA5 MCL is 0.060 mg/L (60 ppb).

Compliance with each MCL is based on the LRAA for TTHM and HAA5 at each location. If one location is out of compliance with the MCL, then the supply is out of compliance.

If monitoring annually or less frequently and no sample exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location. If a sample exceeds the MCL, the supply shall increase monitoring to a dual sample set at each location every 90 days and calculate compliance at the end of four quarters, including the quarter in which the sample exceeded the MCL.

If monitoring quarterly, the LRAA is calculated quarterly using results from each location. If the supply fails to complete four consecutive quarters of monitoring, compliance with the MCL will be based on the average of available data from the most recent four quarters. If the supply takes more than one sample per quarter at a monitoring location, an average of all samples taken in the quarter at that location will be used to determine the LRAA.

The supply is in violation of the MCL when the LRAA exceeds the MCL, based on four consecutive quarters of monitoring, or the LRAA calculated based on fewer than four quarters of data if the MCL would be exceeded regardless of the monitoring results of subsequent quarters. The supply is in violation of the monitoring requirements for each quarter that a result would be used in calculating an LRAA if the supply fails to monitor.

Bromate (for supplies using ozone)

Bromate MCL is 0.010 mg/L (10 ppb).

Compliance is based on an RAA of the most recent four quarters, computed quarterly, of monthly samples (or for months in which the supply takes more than one sample, the average of all samples taken during the month). If the average of samples covering any consecutive four-quarter period exceeds the MCL, the supply is in violation of the MCL and must notify the public, in addition to reporting to the DEQ. If a supply fails to complete 12 consecutive months of monitoring, compliance with the MCL for the last four-quarter compliance period is based on an average of the available data.

Control of Disinfection Byproduct Precursors – Total Organic Carbon (TOC)

Applicability:

☒ Check if this supply uses conventional filtration to treat surface water or groundwater under the direct influence of surface water (including softening plants). Complete remainder of this form below.

☐ Check if this supply uses a method other than conventional filtration. This supply is not required to monitor for disinfection precursors (Total Organic Carbon - TOC). However, in order to qualify for reduced monitoring for disinfection byproducts, this water supply will monitor source water TOC monthly. With DEQ approval, this supply will monitor TOC every 3rd month after the TOC RAA is less than or equal to 4.0 mg/L, based on the most recent 4 quarters of monitoring. STOP HERE - the remainder of this form does not apply.

Sample Sites

☒ This supply will sample at each treatment plant using conventional filtration. Samples must be collected at the same time (may allow for the detention time in the treatment train between raw and finished water sampling points).

Sample for ...	At...	Further Describe the Specific Sample Site
Alkalinity	A point prior to any treatment	
Source water TOC		
Finished water TOC	The combined filter effluent no later than turbidity compliance point	

☐ This supply has more than 1 treatment plant and additional tables are attached.

Frequency

Monitor monthly unless reduced to quarterly by the DEQ (allowed if the treated water TOC RAA is < 2.0 mg/L for 2 consecutive years or < 1.0 mg/L for 1 year).

Treatment Technique

Compliance with the disinfection precursors' requirements is a treatment technique to control disinfection byproduct precursors or TOC, which is the medium for the formation of disinfection byproducts TTHM and HAA5. The treatment technique requires Subpart H supplies that use conventional filtration to reduce the TOC through enhanced coagulation or enhanced softening, so that TOC settles out before the disinfection is applied. However, supplies that meet alternative compliance criteria are not required to remove TOC through enhanced coagulation or enhanced softening (i.e., not required to meet the TOC percent removal requirements).

Four Methods to Comply With Treatment Technique

A. Alternative compliance criteria (ACC). Compliance with ACC is determined quarterly.

1. Raw water TOC RAA is < 2.0 mg/L
2. Finished water TOC RAA is < 2.0 mg/L
3. Raw water TOC RAA is < 4.0 mg/L, raw water alkalinity RAA is > 60 mg/L, and either TTHM or HAA5 RAAs are <= 0.040 mg/L and 0.030 mg/L, respectively.
4. TTHM and HAA5 RAAs are <= 0.040 mg/L and 0.030 mg/L, respectively and the supply uses only chlorine for primary disinfection and maintains a residual in the distribution system.
5. Source water specific ultraviolet absorption (SUVA) RAA is <= 2.0 liters per milligram meter (L/mg-m). SUVA is defined as UV_{254} divided by dissolved organic carbon.

6. Finished water SUVA RAA <= 2.0 l/mg-m.

B. Additional ACC for the supply that practices enhanced softening but cannot achieve required TOC removals. Softening results in:

1. Lowering finished water alkalinity RAA to < 60 mg/L (as $CaCO_3$).
2. Removing not less than 10 mg/L of magnesium hardness (as $CaCO_3$) measured monthly and calculated quarterly as an RAA.

C. Step 1. The supply practices enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in this table.[a, b]

Source-Water TOC, mg/L	Source-Water Alkalinity, mg/L as $CaCO_3$		
	0-60	>60-120	>120[c]
>2.0-4.0	35.0%	25.0%	15.0%
>4.0-8.0	45.0%	35.0%	25.0%
>8.0	50.0%	40.0%	30.0%

[a]Supplies meeting at least one ACC are not required to operate with enhanced coagulation.
[b]Softening supplies meeting at least one additional ACC are not required to operate with enhanced softening.
[c]Supplies practicing softening must meet the TOC removal requirements in this column.

D. Step 2. The supply cannot achieve the Step 1 TOC removals due to water quality parameters or operational constraints.

The supply operates under alternative minimum TOC removal requirements (Step 2) or must apply to the DEQ, within 3 months of failure to achieve the TOC removals, for approval of Step 2 TOC removals. The DEQ may make Step 2 retroactive for the purposes of determining compliance. Until the DEQ approves the alternate minimum TOC removal requirements, the supply is expected to meet the Step 1 TOC removals.

Compliance Calculation Procedure

TOC removal compliance is calculated quarterly, beginning after the supply has collected 12 months of data, by determining an annual average using the following method:

1. Determine actual monthly TOC percent removal, equal to: (1 – [treated water TOC/source water TOC]) x 100.
2. Determine the required monthly TOC percent removal (from Step 1 or Step 2).
3. Divide the value in line 1 of this section by the value in line 2 to determine the monthly value.
4. Add together the results of line 3 of this section for the last 12 months and divide by 12.
5. If the value calculated in line 4 of this section is less than 1.00, the supply is not in compliance with the TOC percent removal requirements.
6. Supply may assign a monthly value of 1.0 when any of the following criteria are met:
   a. In any month that the supply's treated or source water TOC level is < 2.0 mg/L.
   b. In any month that a supply practicing softening removes at least 10 mg/L of magnesium hardness (as $CaCO_3$).
   c. In any month that the supply's source water SUVA, prior to any treatment, is <= 2.0 L/mg-m.
   d. In any month that the supply's finished water SUVA is <= 2.0 L/mg-m.
   e. In any month that a supply practicing enhanced softening lowers alkalinity below 60 mg/L (as $CaCO_3$).

Notes from the Surface Water Treatment Rule

A Subpart H supply must maintain a detectable residual in at least 95 percent of distribution samples each month. If the percent falls below 95 for 2 consecutive months, the supply is in violation of the treatment technique.

A Subpart H supply must measure the residual disinfectant at the entry point (plant tap). The residual shall not be less than 0.2 mg/L for more than 4 hours.

Appendix D

2021 Sanitary Survey Water System Inventory

MI0000600 BENTON HARBOR

Alt. State No. (WSSN):	00600	***Activity Status:***	A	***% SW:*** 100	***% GW :*** 0	***% GWUI:*** 0	
Local Name (District):	DISTRICT 93	***Activity Date:***	1/1/1890	***% SWP:*** 0	***% GWP:*** 0	***% GWUIP:*** 0	
Principle County:	BERRIEN	***Op Category:***	F1S2				
Billable Population:	9103	***Owner Type:***	L				
Service Connections:	3335	***Primary Source:***	SW			***Last Sanitary Survey:***	10/21/2021

Population History

Type	Pop Count	Begin Date	End Date
R	9103	10/1/2021	
R	9970	10/2/2011	9/30/2021

Water System Flow Rates

Flow Rate Type		Quantity / Units	
AVPD	Average Daily Production	960000	GPD
BSLN	Baseline Capacity	20	MGD
TLDS	Total Design Capacity	12000000	GPD

Regulating Agency

DISTRICT 93
DISTRICT 9
MDEQ

Points of Contact

PL				200 E WALL ST BENTON HARBOR, MI 49022
DO	ABUL AHMED F&V OPS CONTRACT OPERATOR			2960 Lucerne Drive GRAND RAPIDS, MI 49546
	BUS MOB	586-668-6169 313-418-3509	x x	aahmed@fv-operations.com
DS	Mr. ROBERT JONES F & V OPERATIONS			2960 LUCERNE DRIVE SE SUITE 100 GRAND RAPIDS, MI 49546
	MOB	810-220-9441	x	rjones@fv-operations.com
OP	Mr. ROBERT JONES F & V OPERATIONS			2960 LUCERNE DRIVE SE SUITE 100 GRAND RAPIDS, MI 49546
	MOB	810-220-9441	x	rjones@fv-operations.com
FC	Mr. ELLIS MITCHELL BENTON HARBOR CITY MANAGER			200 WALL STREET BENTON HARBOR, MI 49022
	BUS	269-927-8408	x	EMITCHELL@bhcity.us
AC	Mr. ELLIS MITCHELL BENTON HARBOR CITY MANAGER			200 WALL STREET BENTON HARBOR, MI 49022
	BUS	269-927-8408	x	EMITCHELL@bhcity.us
OP	Ms. CATHERINE WINN F&V OPERATIONS			HURON SHORES REGIONAL UTILITY AU 247 S BALDWIN RESORT ROAD EAST TAWAS, MI 48730
	BUS FAX MOB	989-362-0050 989-362-0222 517-304-3513	x x x	cwinn@fv-operations.com

AC-Administrative; OW-Owner; DO-Operator in Charge; DS-Distribution Operator; OP-Operator; FC-Financial; PM-Property Manager; EC-Emergency; LE-Lead Engineer; SA-Sampler; LC-Legal; OT-Other; CC-Carbon Copy

Deficiencies Determined in Last 5 Years and/or Unresolved

Deficiency	Severity	Date Determined	Date Resolved	Comments	Description

Deficiency		Severity	Determined	Resolved	Comments	Description
PUCM	Construction & Maintenance	MIN	10/21/2021			Non-working low service pumps, temporary installation of high service motors indicates a significant lack ofmaintenance
MROR	MOR or Annual Pumpage Report	MIN	10/21/2021			1. Finish water meter is not used to report finished water flow and calculate phosphate dose
MROR	MOR or Annual Pumpage Report	SIG	10/21/2021			MOR has various inaccuracies, and pre-filled answers to questions on first page. A thoroughreview of the MOR and the City's process for developing the MOR resulted in several areas of concern requiring corrective action.
MRAN	Analytical Capabilities	SIG	10/21/2021			1. Turbidimeter calibration records not formally kept, staff not trained & no SOP. A comprehensivecalibration schedule and recordkeeping system must be implemented to reflect calibrations that are conducted according to manufacturer specifications.2. CL17 broken during site inspection, not doing 4 hour grabs, no maintenance or SOP. Minimumlevels must be recorded daily and reported to EGLE and must be trended on SCADA with callout alarms in the event of low residual. Furthermore, an SOP for the maintenance and verification of the instrument must be developed and implemented.
TRDF	Disinfection	SIG	10/21/2021			CL17 broken during site inspection, not doing 4 hour grabs, no maintenance or SOP. Minimumlevels must be recorded daily and reported to EGLE and must be trended on SCADA with callout alarms in the event of low residual. Furthermore, an SOP for the maintenance and verification of the instrument must be developed and implemented.
TRDF	Disinfection	MIN	10/21/2021			1. No chlorination point immediately following filters (Rule 1008 (5))2. Operators could not verify if/how disinfection (C*T) requirements were being met
TRFL	Fluoride	SIG	10/21/2021			Verify treatment chemicals are approved under ANSI/NSF standard 60. EGLE could not verify thecertificate for Sodium Fluoride, packaged by Solvay Fluorides LLC. The City must obtain verification of this chemical's certification, and if a certification cannot be verified the current product must be discontinued until such time a certified product can be approved.
TRFL	Fluoride	MIN	10/21/2021			Fluoride saturator -OIC not familiar with functionality, connection to day tank, no containment

TRPO	Phosphate Addition	MIN	10/21/2021		1. PO4 not on SCADA - scale, pump status, and needs to have alarm for failure, also not flow-paced as designed tohigh service meter2. WQP on plant tap not being monitored at least every two weeks for SO4, conductivity
TRFT	Filtration (gravity or membranes)	MIN	10/21/2021		1.Filter wash arms were not operable in Filter 5 at the time of the inspection2.Filters 1 -4 are out of service, improperly abandoned in place (i.e. feed piping)3.Filters 5, 6, 7, 8 effluent piping is in poor condition, actuators need repair/replacement4. Filter to waste - not following SOP to meet ACO, shift operator unaware/unwilling5. Verify filter effluent valves are programmed to limit flow to rated capacity6. Filter flow meters need to be maintained and calibrated, displays not working
TROT	Other	MIN	10/21/2021	This deficiency is specifically for cross connections identified in the WTP during the inspection.	1. Raw water screen fed w/ potable water, no protection (cross connection)2. RPZ not tested: chlorine feed water, fluoride, surface wash
DSSM	Service Lines & Metering	MIN	10/21/2021		Notification of LSL homes not being done
FWCM	Construction & Maintenance	SIG	10/21/2021		Finished water reservoirs missing vent screens, less than 24-inches above grade. Res. Hatches need to be be water tight and sanitary (shoebox), crumbling concrete. Investigate and fix any other unprotected openings. Evidence of unprotected opening of suction well, on floor of venturi room (plywood w/ tar). The water plant high service suction well ceiling and access hatch require corrective action to ensure sanitary condition.
SMOW	Owner Responsibility	MIN	10/21/2021		1. Records management is deficient in a number of items (inadequate turbidimeter calibration records. No record ofdisinfection profiling and benchmarking. Do not have previous sanitary survey.2. Benchtop turbidimeter tested w/ Stablcal, but not regularly recorded, standards soon expiring
SMOW	Owner Responsibility	SIG	10/21/2021	City must complete a capacity study and demonstrate how the TMF capacity will be provided to support the selected alternative . This SD cannot be resolved until all of the deficiencies related to insufficient TMF are resolved.	The owner lacks sufficient technical, managerial, and financial capacity to support the water utility.
SMPR	Permits	MIN	10/21/2021		Removed sludge from lagoon and illegally disposed on WTP property. Need proper disposal

OTOT	All Other	MIN	10/21/2021			This deficiency covers a number of specific findings where a lack of maintenance is creating safety hazards.1. Eye wash stations not checked (next to chemical spills)2. Very old, nearly imploded polymer barrels are a safety hazard3. Bulk chlorine delivery area requires labeling and containment4. Bulk Alum tanks - no overflow, lids are off, very poor maintenance, spilled product5. Alum & Chlorine day tanks have no overflow. Both have evidence of spilled/leaking chemical
SOCM	Construction & Maintenance	MIN	9/14/2018	10/1/2021	Alternative Compliance Schdedule set by ACO effective 3/5/19.Due date: 12/31/2020 per revised ACO. However, the city intends to improve the tank by recoating and fixing other issues, through DWRF project.Completion: tower repainting and repairs completed 10/01/2021.	Conduct inspection on elevated tank. Alternatively, complete recommended improvements including recoating.
MROR	MOR or Annual Pumpage Report	MIN	9/14/2018	8/12/2019	Alternative Compliance Schdedule set by ACO effective 3/5/19. This will be resolved by modifying the MOR to reflect improvements of chlorine analyzer and metering upgrades. Confirmed completion onsite on 8/12/2019.	Reported flows are estimated due to finished water meters not working. Also chlorine needs to be the minimum daily read from the online analyzer, since unattended pumping is practiced year-round.
MRAN	Analytical Capabilities	SIG	9/14/2018	8/12/2019	Fix analyzer and ensure accuracy, record minimum value daily and report on MOR. Alternative Compliance Schdedule set by ACO effective 3/5/19.Due 5/15/2019.	online chlorine analyzer is not functioning accurately, and not recorded as required by law.
TRPT	Pretreatment	SIG	9/14/2018	9/26/2019	Solution is to run alum feed line to the rapid mix basins and use them to provide adequate mixing. Alternative Compliance Schdedule set by ACO effective 3/5/19. Deadline was extended, and alum feed system was constructed prior to permit issuance. The project was not permitted, but a letter dated September 26, 2019 indicates the project is accepted for the record.	Inadequate mixing of coagulant.
TROT	Other	MIN	9/14/2018	3/5/2019	fix finished water metering. CT not a concern given ample residence time and slower flow rates. Alternative Compliance Schdedule set by ACO effective 3/5/19.Due 6/15/2019.	finished water meters are not functioning. estimates of CT are not accurate, or not being done. unaccounted water tracking not possible or not accurate.

DSHV	Hydrants & Valves	SIG	9/14/2018		Submit plan for valve & hydrant inventory and maintenance. Alternative Compliance Schdedule set by ACO effective 3/5/19.Due 6/30/2020 per revised ACO	Insufficient valve and hydrant activities due to limited staff availability. Records are existent but need continuous improvement. Old system and non-working valves are not sufficient to minimize disruption to system when isolating for leaks, repairs, etc. Hydrants have been found to be non-flowing in the system, likely due to either damage to the hydrants or closed isolation valves.11-2-21:Fire Hydrants - no program for flushing, maintenance, repairs. Lack of working hydrants with sufficientflow is a violation of Rule 1105 and could result in a public safety concern should an emergency occur (i.e., fire). A plan for complete hydrant maintenance must be implemented to restore technical capacity
DSXC	Cross Connections	SIG	9/14/2018		dedicate resources or contract work to revamp program. Alternative Compliance Schdedule set by ACO effective 3/5/19.Due 3/31/2020 per revised ACO schedule.	Program needs to be revamped, very little to no work has occurred for a few years. Must include residential component.11-2-21: No cross connection program and no progress since previous SS. The City must dedicate a trainedstaff person to implement this program or obtain a contract with a qualified professional company to implement the program.
DSCM	Construction & Maintenance	MIN	9/14/2018	3/5/2019	Alternative Compliance Schdedule set by ACO effective 3/5/19. This sig def is resolved vicariously through accomplishing a variety of activities, such as revamping rate collection procedures, practicing asset management, engaging engineering firm to conduct distribution system improvements through a low interest DWRF loan.	Age and condition of distribution system materials is such that significant investment needs to start occurring to bring the system up to date.
SMCD	Capacity Development	SIG	9/14/2018		Hire separate operators for distribution and treatment, or contract out. (complete)Alternative Compliance Schdedule set by ACO effective 3/5/19. New compliance timeline needed for DPS supervisor, pending discussions with the city.	Managerial capacity needs to be expanded to provide adequate oversight of treatment and distribution. Current trending of multiple violations indicates a lack of managerial capacity to run the water system. 3/27/2020: identified the further need for a public works supervisor to help direct activities in treatment and distribution. 6/26/2020: have requested the city hire a consultant to conduct a study of technical, managerial, and financial capacity.

FIBG	Budget & Capital Improvement Plan	SIG	9/14/2018	Need to: conduct rate study (done, w/ AMP), implement rate increases, plan for rate increases due 7/1/2020 per amended ACO schedule. Completed as of May 18, 2020.revamp bill collection process, plan due 12/31/2019 (substantially completed as of 6/26/2020, but not formalized by city).Alternative Compliance Schdedule - due set by ACO effective 3/5/19, various extensions.	Water Asset Management plan indicates significant inability to meet debt obligations, and little room for improvement in O&M budget. In addition, significant staff time is spent on bill collection process with a fairly high rate of non-payment. 11-2-21: Water system revenue is insufficient to cover operations, maintenance, and capital costs. Ademonstration of the financial capability of the water system to operate sustainably and in compliance is needed to restore financial capacity.
DSHV	Hydrants & Valves	MIN	6/16/2015		Valves need maintenance program, locating, mapping, replacement. Current situation causing excessive interruptions and possibly pumping issues
DSXC	Cross Connections	MIN	6/16/2015		Program behind; inspections of high hazards

Violations and Enforcement Actions - Last 10 Years

Type	Violation Name	Code	Analyte Name	Period End	Period Begin	RTC Date
53	WATER QUALITY PARAMETER M/R (LCR)	1919	CALCIUM	4/1/2021	6/30/2021	
53	WATER QUALITY PARAMETER M/R (LCR)	1996	TEMPERATURE (CENTIGRAD	4/1/2021	6/30/2021	
53	WATER QUALITY PARAMETER M/R (LCR)	1927	ALKALINITY, TOTAL	4/1/2021	6/30/2021	
53	WATER QUALITY PARAMETER M/R (LCR)	1925	PH	4/1/2021	6/30/2021	
53	WATER QUALITY PARAMETER M/R (LCR)	1064	CONDUCTIVITY @ 25 C UMH	4/1/2021	6/30/2021	
53	WATER QUALITY PARAMETER M/R (LCR)	1055	SULFATE	4/1/2021	6/30/2021	
53	WATER QUALITY PARAMETER M/R (LCR)	1044	ORTHOPHOSPHATE	4/1/2021	6/30/2021	
53	WATER QUALITY PARAMETER M/R (LCR)	1017	CHLORIDE	4/1/2021	6/30/2021	
36	MONITORING, RTN/RPT MAJOR (SWTR-FILTE	0100	TURBIDITY	9/1/2020	9/30/2020	11/2/2020
36	MONITORING, RTN/RPT MAJOR (SWTR-FILTE	0999	CHLORINE	9/1/2020	9/30/2020	11/2/2020
65	PUBLIC EDUCATION (LCR)	5000	LEAD & COPPER RULE	3/12/2021	4/1/2021	4/1/2021
07	TREATMENT TECHNIQUES (OTHER)	1002	ALUMINUM	5/17/2021	5/18/2021	5/18/2021
03	MONITORING, ROUTINE MAJOR	2326	PENTACHLOROPHENOL	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2110	2,4,5-TP	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2105	2,4-D	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2041	DINOSEB	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2040	PICLORAM	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2326	PENTACHLOROPHENOL	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2110	2,4,5-TP	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2105	2,4-D	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2041	DINOSEB	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2040	PICLORAM	4/1/2020	6/30/2020	9/22/2020

03	MONITORING, ROUTINE MAJOR	2047	ALDICARB	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2046	CARBOFURAN	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2044	ALDICARB SULFONE	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2043	ALDICARB SULFOXIDE	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2036	OXAMYL	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2047	ALDICARB	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2046	CARBOFURAN	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2044	ALDICARB SULFONE	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2043	ALDICARB SULFOXIDE	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2036	OXAMYL	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2959	CHLORDANE	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2383	TOTAL POLYCHLORINATED	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2306	BENZO(A)PYRENE	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2274	HEXACHLOROBENZENE	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2067	HEPTACHLOR EPOXIDE	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2065	HEPTACHLOR	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2051	LASSO	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2050	ATRAZINE	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2042	HEXACHLOROCYCLOPENTA	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2039	DI(2-ETHYLHEXYL) PHTHALA	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2037	SIMAZINE	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2035	DI(2-ETHYLHEXYL) ADIPATE	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2020	TOXAPHENE	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2015	METHOXYCHLOR	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2010	BHC-GAMMA	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2005	ENDRIN	1/1/2020	3/31/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2959	CHLORDANE	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2383	TOTAL POLYCHLORINATED	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2306	BENZO(A)PYRENE	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2274	HEXACHLOROBENZENE	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2067	HEPTACHLOR EPOXIDE	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2065	HEPTACHLOR	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2051	LASSO	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2050	ATRAZINE	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2042	HEXACHLOROCYCLOPENTA	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2039	DI(2-ETHYLHEXYL) PHTHALA	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2037	SIMAZINE	4/1/2020	6/30/2020	9/22/2020

03	MONITORING, ROUTINE MAJOR	2035	DI(2-ETHYLHEXYL) ADIPATE	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2020	TOXAPHENE	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2015	METHOXYCHLOR	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2010	BHC-GAMMA	4/1/2020	6/30/2020	9/22/2020
03	MONITORING, ROUTINE MAJOR	2005	ENDRIN	4/1/2020	6/30/2020	9/22/2020
27	MONITORING, ROUTINE (DBP), MAJOR	2920	CARBON, TOTAL	1/1/2021	3/31/2021	3/26/2021
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2816	HFPO-DA	8/3/2020	2/3/2021	3/22/2021
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2809	PERFLUOROHEXANOIC ACID	8/3/2020	2/3/2021	3/22/2021
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2806	PERFLUOROCTANOIC ACID (	8/3/2020	2/3/2021	3/22/2021
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2805	PERFLUOROCTANE SULFONI	8/3/2020	2/3/2021	3/22/2021
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2804	PERFLUORONONANOIC ACID	8/3/2020	2/3/2021	3/22/2021
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2803	PERFLUOROHEXANE SULFO	8/3/2020	2/3/2021	3/22/2021
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2801	PERFLUOROBUTANESULFO	8/3/2020	2/3/2021	3/22/2021
65	PUBLIC EDUCATION (LCR)	5000	LEAD & COPPER RULE	8/30/2020	3/1/2021	3/1/2021
65	PUBLIC EDUCATION (LCR)	5000	LEAD & COPPER RULE	3/2/2020	3/1/2021	3/1/2021
10	OPERATIONS REPORT	0999	CHLORINE	9/1/2020	9/30/2020	10/5/2020
07	TREATMENT TECHNIQUES (OTHER)	1002	ALUMINUM	11/4/2020	11/4/2020	11/10/2021
07	TREATMENT TECHNIQUES (OTHER)	1002	ALUMINUM	11/4/2020	11/4/2020	11/5/2020
03	MONITORING, ROUTINE MAJOR	2959	CHLORDANE	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2383	TOTAL POLYCHLORINATED	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2326	PENTACHLOROPHENOL	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2306	BENZO(A)PYRENE	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2274	HEXACHLOROBENZENE	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2110	2,4,5-TP	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2105	2,4-D	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2067	HEPTACHLOR EPOXIDE	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2065	HEPTACHLOR	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2051	LASSO	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2050	ATRAZINE	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2047	ALDICARB	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2046	CARBOFURAN	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2044	ALDICARB SULFONE	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2043	ALDICARB SULFOXIDE	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2042	HEXACHLOROCYCLOPENTA	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2041	DINOSEB	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2040	PICLORAM	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2039	DI(2-ETHYLHEXYL) PHTHALA	10/1/2019	12/31/2019	9/22/2020

03	MONITORING, ROUTINE MAJOR	2037	SIMAZINE	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2036	OXAMYL	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2035	DI(2-ETHYLHEXYL) ADIPATE	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2020	TOXAPHENE	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2015	METHOXYCHLOR	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2010	BHC-GAMMA	10/1/2019	12/31/2019	9/22/2020
03	MONITORING, ROUTINE MAJOR	2005	ENDRIN	10/1/2019	12/31/2019	9/22/2020
07	TREATMENT TECHNIQUES (OTHER)	1012	RESIDUAL CHLORINE	9/9/2020	9/21/2020	9/21/2020
SA	STATE REPORTS (PUMPAGE, CROSS CONN,	LCSP	LEAD AND COPPER SAMPLIN	1/2/2020	5/6/2021	5/6/2021
66	LEAD CONSUMER NOTICE (LCR)	5000	LEAD & COPPER RULE	9/29/2019	12/6/2019	12/6/2019
52	FOLLOW-UP OR ROUTINE TAP M/R (LCR)	5000	LEAD & COPPER RULE	1/1/2020	6/10/2020	6/10/2020
53	WATER QUALITY PARAMETER M/R (LCR)	1919	CALCIUM	1/1/2019	6/30/2019	7/3/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1996	TEMPERATURE (CENTIGRAD	1/1/2019	6/30/2019	7/3/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1927	ALKALINITY, TOTAL	1/1/2019	6/30/2019	7/3/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1925	PH	1/1/2019	6/30/2019	7/3/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1064	CONDUCTIVITY @ 25 C UMH	1/1/2019	6/30/2019	7/3/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1055	SULFATE	1/1/2019	6/30/2019	7/3/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1017	CHLORIDE	1/1/2019	6/30/2019	7/3/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1017	CHLORIDE	1/1/2019	6/30/2019	7/3/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1055	SULFATE	1/1/2019	6/30/2019	7/3/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1996	TEMPERATURE (CENTIGRAD	1/1/2019	6/30/2019	9/11/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1064	CONDUCTIVITY @ 25 C UMH	1/1/2019	6/30/2019	9/11/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1919	CALCIUM	1/1/2019	6/30/2019	9/11/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1927	ALKALINITY, TOTAL	1/1/2019	6/30/2019	9/11/2019
53	WATER QUALITY PARAMETER M/R (LCR)	1925	PH	1/1/2019	6/30/2019	9/11/2019
03	MONITORING, ROUTINE MAJOR	2959	CHLORDANE	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2383	TOTAL POLYCHLORINATED	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2326	PENTACHLOROPHENOL	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2274	HEXACHLOROBENZENE	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2110	2,4,5-TP	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2105	2,4-D	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2067	HEPTACHLOR EPOXIDE	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2065	HEPTACHLOR	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2051	LASSO	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2050	ATRAZINE	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2047	ALDICARB	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2046	CARBOFURAN	4/1/2019	6/30/2019	9/24/2019

03	MONITORING, ROUTINE MAJOR	2044	ALDICARB SULFONE	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2043	ALDICARB SULFOXIDE	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2042	HEXACHLOROCYCLOPENTA	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2041	DINOSEB	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2040	PICLORAM	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2037	SIMAZINE	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2036	OXAMYL	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2020	TOXAPHENE	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2015	METHOXYCHLOR	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2010	BHC-GAMMA	4/1/2019	6/30/2019	9/24/2019
03	MONITORING, ROUTINE MAJOR	2005	ENDRIN	4/1/2019	6/30/2019	9/24/2019
52	FOLLOW-UP OR ROUTINE TAP M/R (LCR)	5000	LEAD & COPPER RULE	7/1/2019	6/10/2020	6/10/2020
32	MONITORING, SOURCE (LT2), MINOR	3014	E. COLI	6/1/2018	6/30/2018	7/16/2018
32	MONITORING, SOURCE (LT2), MINOR	3014	E. COLI	5/1/2018	5/31/2018	7/16/2018
32	MONITORING, SOURCE (LT2), MINOR	3014	E. COLI	4/1/2018	4/30/2018	7/16/2018
32	MONITORING, SOURCE (LT2), MINOR	3014	E. COLI	2/1/2018	2/28/2018	7/16/2018
32	MONITORING, SOURCE (LT2), MINOR	3014	E. COLI	1/1/2018	1/31/2018	7/16/2018
32	MONITORING, SOURCE (LT2), MINOR	3014	E. COLI	12/1/2017	12/31/2017	7/16/2018
46	INADEQUATE DBP PRECURSOR REMOVAL	2920	CARBON, TOTAL	7/1/2018	9/30/2018	12/31/2018
03	MONITORING, ROUTINE MAJOR	2959	CHLORDANE	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2383	TOTAL POLYCHLORINATED	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2326	PENTACHLOROPHENOL	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2274	HEXACHLOROBENZENE	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2110	2,4,5-TP	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2105	2,4-D	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2067	HEPTACHLOR EPOXIDE	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2065	HEPTACHLOR	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2051	LASSO	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2050	ATRAZINE	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2047	ALDICARB	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2046	CARBOFURAN	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2044	ALDICARB SULFONE	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2043	ALDICARB SULFOXIDE	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2042	HEXACHLOROCYCLOPENTA	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2041	DINOSEB	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2040	PICLORAM	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2037	SIMAZINE	7/1/2018	9/30/2018	12/11/2019

03	MONITORING, ROUTINE MAJOR	2036	OXAMYL	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2020	TOXAPHENE	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2015	METHOXYCHLOR	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2010	BHC-GAMMA	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	2005	ENDRIN	7/1/2018	9/30/2018	12/11/2019
03	MONITORING, ROUTINE MAJOR	1018	CARBON, TOTAL	9/1/2018	9/30/2018	10/30/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	1024	CYANIDE	1/1/2018	12/31/2018	11/7/2018
03	MONITORING, ROUTINE MAJOR	2959	CHLORDANE	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2383	TOTAL POLYCHLORINATED	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2326	PENTACHLOROPHENOL	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2274	HEXACHLOROBENZENE	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2110	2,4,5-TP	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2105	2,4-D	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2067	HEPTACHLOR EPOXIDE	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2065	HEPTACHLOR	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2051	LASSO	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2050	ATRAZINE	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2047	ALDICARB	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2046	CARBOFURAN	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2044	ALDICARB SULFONE	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2043	ALDICARB SULFOXIDE	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2042	HEXACHLOROCYCLOPENTA	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2041	DINOSEB	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2040	PICLORAM	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2037	SIMAZINE	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2036	OXAMYL	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2020	TOXAPHENE	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2015	METHOXYCHLOR	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2010	BHC-GAMMA	4/1/2018	6/30/2018	9/22/2020
03	MONITORING, ROUTINE MAJOR	2005	ENDRIN	4/1/2018	6/30/2018	9/22/2020
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2996	STYRENE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2992	ETHYLBENZENE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2991	TOLUENE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2990	BENZENE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2989	CHLOROBENZENE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2987	TETRACHLOROETHYLENE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2985	1,1,2-TRICHLOROETHANE	1/1/2018	12/31/2018	11/7/2018

S3	STATE M/R (ENTRY POINT CHEM/RAD)	2984	TRICHLOROETHYLENE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2983	1,2-DICHLOROPROPANE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2982	CARBON TETRACHLORIDE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2981	1,1,1-TRICHLOROETHANE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2980	1,2-DICHLOROETHANE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2979	TRANS-1,2-DICHLOROETHYL	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2977	1,1-DICHLOROETHYLENE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2976	VINYL CHLORIDE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2969	P-DICHLOROBENZENE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2968	O-DICHLOROBENZENE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2964	DICHLOROMETHANE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2955	XYLENES, TOTAL	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2380	CIS-1,2-DICHLOROETHYLENE	1/1/2018	12/31/2018	11/7/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2378	1,2,4-TRICHLOROBENZENE	1/1/2018	12/31/2018	11/7/2018
03	MONITORING, ROUTINE MAJOR	1018	CARBON, TOTAL	8/1/2018	8/31/2018	10/30/2018
27	MONITORING, ROUTINE (DBP), MAJOR	2456	TOTAL HALOACETIC ACIDS (	6/1/2018	8/31/2018	11/7/2018
27	MONITORING, ROUTINE (DBP), MAJOR	2950	TTHM	6/1/2018	8/31/2018	11/7/2018
03	MONITORING, ROUTINE MAJOR	1018	CARBON, TOTAL	6/1/2018	6/30/2018	10/30/2018
03	MONITORING, ROUTINE MAJOR	1018	CARBON, TOTAL	7/1/2018	7/31/2018	10/30/2018
03	MONITORING, ROUTINE MAJOR	1018	CARBON, TOTAL	5/1/2018	5/31/2018	10/30/2018
46	INADEQUATE DBP PRECURSOR REMOVAL	2920	CARBON, TOTAL	4/1/2018	6/30/2018	12/31/2018
32	MONITORING, SOURCE (LT2), MAJOR	3014	E. COLI	3/1/2018	3/31/2018	7/16/2018
75	PUBLIC NOTICE RULE LINKED TO VIOLATION	7500	PUBLIC NOTICE	5/19/2018	6/15/2018	6/15/2018
46	INADEQUATE DBP PRECURSOR REMOVAL	2920	CARBON, TOTAL	1/1/2018	3/31/2018	12/31/2018
S3	STATE M/R (ENTRY POINT CHEM/RAD)	1024	CYANIDE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2996	STYRENE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2992	ETHYLBENZENE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2991	TOLUENE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2990	BENZENE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2989	CHLOROBENZENE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2987	TETRACHLOROETHYLENE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2985	1,1,2-TRICHLOROETHANE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2984	TRICHLOROETHYLENE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2983	1,2-DICHLOROPROPANE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2982	CARBON TETRACHLORIDE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2981	1,1,1-TRICHLOROETHANE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2980	1,2-DICHLOROETHANE	1/1/2017	12/31/2017	10/23/2017

S3	STATE M/R (ENTRY POINT CHEM/RAD)	2979	TRANS-1,2-DICHLOROETHYL	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2977	1,1-DICHLOROETHYLENE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2976	VINYL CHLORIDE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2969	P-DICHLOROBENZENE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2968	O-DICHLOROBENZENE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2964	DICHLOROMETHANE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2955	XYLENES, TOTAL	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2380	CIS-1,2-DICHLOROETHYLENE	1/1/2017	12/31/2017	10/23/2017
S3	STATE M/R (ENTRY POINT CHEM/RAD)	2378	1,2,4-TRICHLOROBENZENE	1/1/2017	12/31/2017	10/23/2017
27	MONITORING, ROUTINE (DBP), MAJOR	2920	CARBON, TOTAL	1/1/2016	3/31/2016	6/1/2016
02	MCL, LRAA	2456	TOTAL HALOACETIC ACIDS (	10/1/2014	12/31/2014	3/2/2015
27	MONITORING, ROUTINE (DBP), MAJOR	2456	TOTAL HALOACETIC ACIDS (	8/1/2014	8/31/2014	11/11/2014
27	MONITORING, ROUTINE (DBP), MAJOR	2950	TTHM	8/1/2014	8/31/2014	11/11/2014
52	FOLLOW-UP OR ROUTINE TAP M/R (LCR)	5000	LEAD & COPPER RULE	10/1/2011	9/11/2012	9/11/2012

MI0000600 BENTON HARBOR

Intake Facilities

Site Code IN225 **Facility Name:** RAW WATER INTAKE IN LAKE MICH **Status** A **Availability** P

Local Name DIA 36 IN; LGT 3950 FT; SUB 42 FT **Constructed:** 1/1/1947 **Modified:**

Water Body: LAKE MICHIGAN **Latitude:** 42.13055 **Longitude:** -86.4861

Comments Cleaned and repairs made summer of 2021

Indicator Type		Value and/or Date
EMER	Emergency Power	NO
INMC	Mussel Control Provisions	NO

Measure Type		Quantity	Units
INSB	Submergence at Low Water Elevation	27	FT
INDA	Intake Pipe Diameter	36	IN
INLT	Intake Pipe Length	4000	FT

Flow Rate Type		Quantity	Units
APCD	Approved Design Capacity	24	MGD

Comments / Corrections / Updates

MI0000600 BENTON HARBOR

Treatment Facilities

Site Code TP001 **Facility Name:** WATER FILTRATION PLANT **Status/Date:** A 1/1/1800

Availability: P **Constructed Date:** 1/1/1950 **Lat / Long** 42.123783 -86.474867

Local Name:

Comments / Corrections / Updates

Treatment Process and Objective Pairings	
FLUORIDATION	OTHER
SEDIMENTATION	PARTICULATE REMOVAL
FLOCCULATION	PARTICULATE REMOVAL
FILTRATION, RAPID SAND	PARTICULATE REMOVAL
COAGULATION	PARTICULATE REMOVAL
HYPOCHLORINATION, PRE	DISINFECTION
HYPOCHLORINATION, POST	DISINFECTION
INHIBITOR, ORTHOPHOSPHATE	CORROSION CONTROL

Indicator Type		Value and/or Date
EMER	Emergency Power	YES
EMPT	Emergency Power Type	PERM
METR	Metered	YES
INEM	Emergency Intake Provisions	NO
INMC	Mussel Control Provisions	NO
INBK	Intake Backflush Provisions	NO

Flow Rate Type		Quantity / Units	
APCD	Approved Design Capacity	8	MGD

MI0000600 BENTON HARBOR

Storage Facilities

Site Code ST001 **Facility Name:** BRITAIN ELEVATED TANK **Local Name:**

Type: EL **Material:** ST **Coating:** AP **Status** A **Constructed Date:** 1/1/1938

Comments

Indicator Type		Value and/or Date	
ALTV	Altitude Valve Indicator	NO	
COVD	Covered Indicator	YES	
CAPR	Cathodic Protection	NO	10/1/2021
MXSY	Mixing System	YES	10/1/2021
DTPT	Date Last Painted (wet interior)	YES	7/1/2021
DRAI	Drain Present	YES	
MUDV	Mud Valve	YES	
TBPS	Tank Bypass	YES	

Comments / Corrections / Updates

Flow Rate Type		Quantity / Units	
APCD	Approved Design Capacity	0.65	MGD

Site Code ST002 **Facility Name:** WTP FINISHED WATER RESERVOIR **Local Name:**

Type: RS **Material:** CC **Coating:** **Status** A **Constructed Date:** 1/1/1950

Comments

Indicator Type		Value and/or Date
COVD	Covered Indicator	YES
ISVL	Isolation Valve	YES
TBPS	Tank Bypass	YES
TABG	Tank Above Grade	NO

Comments / Corrections / Updates

Flow Rate Type		Quantity / Units	
APCD	Approved Design Capacity	2	MGL

Type: EL=elevated GR=ground HD=hydropneumatic BL=bladder ST=standpipe UN=underground
Material: ST=steel CC=concrete AC=asbestos cement AS=asphalt CP=copper ER=earth FG=fiberglass PL=plastic WD=wood
Coating: AP=approved paint ER=epoxy resin FG=fiberglass GR=greased GS=glass-lined steel PL=plastic UN=unlined

MI0000600 BENTON HARBOR

Pump Facilities

Site Code PF001 **Facility Name:** LOW SERVICE **Local Name:**
Pump Type: **Status** A **Availability** **Constructed:** 1/1/1950 **Modified:**
Comments
Pump Description

Indicator Type		Value and/or Date
EMER	Emergency Power	YES
METR	Metered	YES

Comments / Corrections / Updates

Flow Rate Type		Quantity / Units
FIRM	Firm Capacity	9 MGD

Site Code PF002 **Facility Name:** HIGH SERVICE **Local Name:**
Pump Type: **Status** A **Availability** **Constructed:** 1/1/1950 **Modified:**
Comments
Pump Description

Indicator Type		Value and/or Date
EMER	Emergency Power	YES
EMPT	Emergency Power Type	PERM
METR	Metered	YES

Comments / Corrections / Updates

Flow Rate Type		Quantity / Units
FIRM	Firm Capacity	8 MGD

Type: CF=centrifugal JT=jet PD=positive displacement SC=screw SU=submersible VT=vertical turbine

Distribution System

Site Code DIST **Facility Name:** DISTRIBUTION SYSTEM **Status** A
Comments

Comments / Corrections / Updates