IOWA DEPARTMENT OF NATURAL RESOURCES

CONSENT AMENDMENT TO ADMINISTRATIVE ORDER

IN THE MATTER OF:	CONSENT AMENDMENT TO ADMINISTRATIVE ORDER
WATER BOARD, CHARITON MUNICIPAL WATER WORKS Public Water Supply Facility No. 5903011	NO. 2016-WS-01-A1

TO: **Roger Bingham, Chairman**
Water Board
Chariton Municipal Water Works
101 Albia Road, P.O. Box 866
Chariton, IA 50049

I. SUMMARY

Administrative Order No. 2016-WS-01 (order) was issued to the Water Board, Chariton Municipal Water Works (Water Board), by the Iowa Department of Natural Resources (Department) on February 10, 2016 and was appealed by the Water Board. The Department and the Water Board enter into this consent amendment to the order (consent amendment) to resolve the issues raised by the appeal. This consent amendment requires the Water Board to:

1. Comply with minimum chlorine contact time (CT) requirements before the first customer (water plant service line);
2. Complete a special study to investigate the reason for low chlorine residuals at the source/entry point entering the distribution system and to develop an implementation solution within the time frame agreed upon by the parties, but by no later than January 31, 2017. Items that should be included are a study of the detention time to the finished water chlorine analyzer to ensure the sample is representative, a chlorine demand study on the clear well, and a demonstration of how the chlorine feed point following ammonia addition could be used to remedy this issue;
3. Complete any adjustments to the SCADA system upgrades installed in 2015 necessary in order to ensure all data generated at the facility is sufficient to comply with self-monitoring requirements as directed by the Department and is maintained at the facility for inspection by the Department in a form that allows easy retrieval and interpretation;

4. Maintain the services of a direct responsible charge operator who is a properly certified grade 3 water treatment and grade 2 water distribution operator and qualified water treatment and water distribution staff. All certified operation personnel, including the operator in charge, are required to have knowledge and experience in surface water plant operation and maintenance and experience in troubleshooting surface water treatment plant problems. A minimum of a grade 2 water treatment operator must be at the water treatment plant when it is in operation;

5. Comply with all surface water treatment and turbidity requirements;

6. Comply with the total trihalomethane (TTHM) and haloacetic acid (HAA5) maximum contaminant levels (MCLs) and monitoring requirements;

7. Maintain an accurate calibration protocol for all online instrumentation that includes, but is not limited to, method of calibration, calibration frequency, calibration standards, verification, documentation, data collection, and data reporting in order to meet the requirements of 567 IAC 43.5(4)"b"(1)1. This calibration protocol was approved by the Department on September 30, 2016. Prepare any revisions to the calibration protocol for all online instrumentation within 30 days of each request for revision;

8. Submit monthly operation reports (MORs) to Field Office No. 5 (FO 5) by the 10th of the month following the reporting month. The reports are required to be complete and accurate and contain all information required by the Department. Submit all required additional information to FO 5 as requested by FO 5 to document the information on the submitted MORs and to confirm any of the information reported on the MOR within the timeframe requested by FO 5;

9. Conduct monitoring in accordance with the revised permit that was issued on September 18, 2015 for this facility, as modified by the revised permit issued on May 24, 2016, and any future revised permits;

10. Maintain the revised system specific monitoring alert plan identifying baseline and action levels and appropriate corrective actions for total chlorine, monochloramine, free available ammonia, and nitrite as conditionally approved by the Department's FO 5 on September 30, 2016. FO 5 and the Water Works will continue to work together to finalize outstanding issues identified in the FO 5 review of the plan submitted by the Water Board to comply with this provision. Prepare any revisions to the plan as required by Department staff within 30 days of each request for revision.

11. New construction permits for improvements may be denied until this system makes the required corrections and attains viable status in accordance with 567 IAC 43.8(7). You are advised the Drinking Water State Revolving Fund has special funding available that includes loan forgiveness of up to 75 percent for public health protection projects that return a system to viable status.

12. Perform public notification by November 1, 2016 in accordance with the treatment technique violation for turbidity monitoring issued on April 1, 2015;

13. The parties agree to dismissal of the appeal; and

14. Pay a penalty as set forth in this order.

Any questions regarding this order should be directed to:

Relating to technical requirements:

Janet Gastineau
Environmental Specialist Senior
IDNR Field Office No. 5
7900 Hickman Rd. Suite 200
Windsor Heights, Iowa 50234
Ph: 515/725-0334

Relating to legal issues:

Diana Hansen
Attorney at Law
Iowa Department of Natural Resources
502 East 9th Street
Des Moines, Iowa 50319-0034
Ph: 515/725-8248

Mail payment of penalty to:

Iowa Department of Natural Resources
502 East 9th Street
Des Moines, Iowa 50319-0034

II. JURISDICTION

The parties agree that this consent amendment to the order is issued pursuant to Iowa Code section 455B.175(1), which authorizes the Director to issue any order necessary to secure compliance with or prevent a violation of Iowa Code chapter 455B, Division III, Part 1, and the rules promulgated or permits issued pursuant thereto, and Iowa Code section 455B.109 and 567 Iowa Administrative Code (IAC) 10(455B), which authorize the Director to assess administrative penalties. The Water Board neither admits nor denies the Statement of Facts, Conclusions of Law or Penalty as set forth herein.

III. STATEMENT OF FACTS

Facility Description

1. The Water Board regulates and operates the PWS system serving the City of Chariton (City). Raw water is pumped from either the 80 acre Lake Ellis or the 117 acre Lake Morris, which are surface water sources. Treatment at the water treatment plant currently consists of potassium permanganate injection for taste and odor and oxidation of iron and manganese, and ferric chloride at the raw water pump building. Powdered activated carbon can also be used at the raw water pump building based on seasonal changes. Raw water is pumped approximately 400 feet to the water treatment plant where there is forced draft aeration followed by cationic polymer and polyaluminum chloride addition prior to the flow splitting to two solids contact clarifiers. Following clarification, there are four gravity carbon/gravel/sand media filters. Sodium hypochlorite and fluoride are injected prior to a baffled clear well. Caustic soda is added inside the clear well for stabilization. On the discharge side of the high service pumps, there is injection of ammonium sulfate followed by sodium hypochlorite for the formation of chloramines as disinfectant in the distribution system. Normal operation is for two 100 horsepower vertical turbine high service pumps to pump finished water from the 0.067

MG clearwell at the treatment plant to the east 1.0 MG ground storage reservoir (GSR) where there is a pressure booster pump station with three pumps. Pressure is then maintained by two 250,000-gallon elevated storage towers (ESTs) and one 150,000-gallon EST.

2. The PWS facility serving the City provides piped water to the public for human consumption and regularly serves at least 25 persons. This system is classified as a community public water system and is open all year. This system serves a population of approximately 4,321 persons.

Water Supply Operation Permit

3. On September 15, 2014, the Department's Water Supply Operations Section (WSOS) issued a revised water supply operation permit (permit) with an Appendix 1 to this facility. Appendix 1 included a compliance schedule requiring replacement of the SCADA system at the treatment plant, training for the Water Board, submittal of an evaluation report, and submittal of a PER. A revised permit was issued on September 18, 2015. The revised permit includes daily monitoring at the source/entry point and at sites representative of the distribution system for total chlorine, monochloramine, and free available ammonia.

4. Appendix 1 of the September 15, 2014 permit required installation of a new SCADA system due to the facility's inability to produce five years of turbidity records or access to this data from the existing SCADA system. The permit required the facility to obtain proposals for the new SCADA system by December 15, 2014 and to install the system by June 15, 2015. The training for the Water Board was required to be completed by November 15, 2014. The permit required submittal of an evaluation report by a licensed professional engineer or qualified consultant by December 15, 2014. The report was required to evaluate coagulation, settling, and filtration to determine the cause of high combined filter effluent turbidity and to recommend operational and engineering solutions.

The permit required the submittal of a PER prepared by a licensed professional engineer to the Department's WSES for review by March 15, 2015. The PER was required to include an evaluation of alternate water sources, a detailed cost analysis of implementing alternate water sources and any required treatment technologies proposed in the evaluation report, and recommendations for complying with the turbidity and CT rules.

5. The PER was submitted to the Department for review on or about March 15, 2015. The PER was reviewed by the Department's WSES and comments were provided to the Water Board and its engineer on May 28, 2015. The WSES informed the Water Board's engineer that the Water Board must provide additional information to address WSES's comments before the PER can be approved by the WSES. The Water Board's engineer was directed to provide a revised evaluation of alternate water sources to address the

WSES engineer's comments. The WSES engineer's comments required the Water Board to submit a new project estimate from the Rathbun Regional Water Association as one of the alternatives since current detailed cost information for this alternative was not included in the PER. Other required PER revisions included a revised detailed cost analysis for implementing alternate water sources, the annual operating costs for each alternative, the options for financing each alternative and the operating costs associated with each alternative. A revised PER was received on December 17, 2015, but did not include a construction schedule based on the alternatives analysis as required by Appendix 1 or a recommendation on how to proceed.

6. On December 15, 2014, the Water Board's engineer submitted the required evaluation report. Duane Covington, the operator in charge, submitted one SCADA proposal to the Department on December 15, 2014. On January 15, 2015, FO 5 sent the Water Board a letter stating that the facility had not complied with Appendix 1 requirements since the submittals were not complete.

7. The January 15, 2015, FO 5 letter to the Water Board stated that the Jetco Electric proposal submitted for the SCADA system upgrade was not adequate in that only one proposal was submitted rather than several proposals as required by Appendix 1 of the permit. The FO 5 letter also found the submittal to be deficient in that the proposal did not satisfy the permit (Appendix 1) requirement that it include provisions and policies for data storage and handling. The FO 5 letter stated that prior to purchase and installation of a new SCADA system and before March 15, 2015, the Water Board engineer was required to consult with the Department to make sure the new SCADA system complies with rule requirements. The FO 5 letter reminded the Water Board that the new SCADA system was required to be installed by June 15, 2015. The new SCADA system was installed at the water treatment plant June 2015, but the Department experienced repeated delays when data from the new SCADA system was requested.

Operation Evaluation Level Report- HAA5 MCL Level Exceeded

8. On December 22, 2014, the WSOS sent a letter to the Water Board requiring an OEL report be submitted due to the exceedance of the HAA5 MCL of 0.060 mg/L for fourth quarter 2014 samples. The elevated levels triggered the requirement to calculate the OEL. The OEL was calculated to be 0.067 mg/L for site DB01 – 803 Braden Rd and 0.066 mg/L for site DB02 – HyVee Rd + Osceola Rd. The report was due by March 22, 2015. The Department received the Water Board's OEL report on March 4, 2015. The report stated that source and treatment evaluations were done, but they were not submitted with the report.

9. On July 7, 2015, WSOS sent a letter to the Water Board requiring an OEL report. The HAA5 MCL of 0.060 mg/L was exceeded by samples taken for this PWS system. The OEL was calculated to be 0.062 mg/L for site DB01 – 803 Braden Rd and 0.0616 mg/L for site DB02 – HyVee Rd + Osceola Rd. The OEL report was required to be

submitted to WSOS staff by October 7, 2015. The Water Board submitted a report to WSOS staff by the due date. On November 10, 2015, WSES sent a letter to the Water Board indicating that the submittal did not meet the requirements for an OEL report; an additional submittal was requested by December 11, 2015. The report was received on January 4, 2016 and is under review.

10. On September 23, 2015, WSOS issued a MCL violation for HAA5 at sites DB01 and DB02 for the monitoring period ending September 30, 2015. The violation required public notification, which was completed within the required timeframe.

Treatment Technique Violations for Disinfectant Residual

11. The Water Board has been issued notices of violation (NOVs) by FO 5 for failure to obtain minimum chlorine CT. By an NOV letter dated January 22, 2014, FO 5 notified the Water Board that it failed to obtain minimum residual disinfection concentration for the corresponding disinfectant CT on December 10, 2013.

12. The January 22, 2014 NOV letter stated that because of this failure, the minimum disinfection treatment required by 567 IAC 43.5(2)"a" for surface water systems was not met and that this was a treatment technique violation. "The disinfection treatment requirement is to ensure adequate inactivation or removal of at least 99.9 % of *Giardi lamblia* cysts and 99.9 % of viruses. The system's total inactivation ratio must be equal to or greater than 1.0 in order to ensure that the minimum inactivation and removal requirements have been achieved. An inactivation ratio of 0.9 was recorded on December 10, 2013." The NOV letter required that the Water Board provide public notification of this treatment technique violation.

13. On February 2, 2015, FO 5 issued an NOV to the Water Board for failure to meet the required CT on December 2, 2014. The NOV stated that this was considered a treatment technique violation. The NOV required that public notification be given of this treatment technique violation.

14. On April 1, 2015, FO 5 issued an NOV to the Water Board for failure to obtain minimum chlorine residual disinfectant concentration entering the distribution system on March 26 and 27, 2015. The residual disinfectant concentration in the water entering the distribution system cannot be less than 0.3 mg/L free residual or 1.5 mg/L total residual for more than four hours, in accordance with 567 IAC 43.5(2)"b". The NOV letter stated that "According to trends submitted when reporting this event, the residual was measured at less than 1.5 mg/L total residual for approximately 12 hours, which is a treatment technique violation. Operators did not learn of the low residuals until arriving at the water plant March 27, 2015, to begin production." However, the violation was formally appealed on May 12, 2015, and public notification was not completed by May 4, 2015, as required.

15. On April 14, 2105, FO 5 issued an NOV to the Water Board for failure to maintain adequate chlorine residuals in the distribution system pursuant to 567 IAC 42.4(3)"b" and failure to comply with 567 IAC 43.5(2). The NOV letter was issued based on an inspection report for an April 11, 2015 inspection. The inspection report noted less than adequate disinfectant residuals at one sample location and difficulties after shutoff of the high service pump in raising the total chlorine residual levels. The inspection report also noted that obtained chlorine contact time (CT) was not being calculated on a daily basis. The operator in charge and the water system management were reminded that the total inactivation ratio is required to be calculated each day the treatment plant is in operation in order to determine if the system's total inactivation ratio is equal to or greater than 1.0, which ensures the minimum inactivation and removal requirements have been achieved. The report stated that failure to perform this calculation daily would continue to result in notices of violation.

16. Based on the Lucas County Assessor and Water Works customer database, there are four residential properties owned by Karen Crosby, Thomas and Karen Tobin, John and Glenna McVey, and Stanley and Alma Vanderwoude along 482nd Street between the water treatment plant and the ground storage reservoir. The disinfectant residual being delivered to these customers is based on the finished water continuous chlorine analyzer, which is located in the raw pump building and is plumbed off the same transmission line that serves these four residences. If the disinfectant residual recorded by the finished water chlorine analyzer is less than the required minimum residuals, it is not possible to know what the disinfectant level being delivered to these four families was during the approximately 12 hour period at issue in the April 1, 2015 NOV. Since issuance of the April 1, 2015 NOV for a treatment technique violation for disinfectant residuals, the Department has been provided additional information from the Water Works and the engineering consultant retained by the Water Works. It was determined that the residences in question were receiving water that should have had adequate disinfection. The portion of the NOV relating to this treatment technique violation is rescinded. This resolves the Water Work's appeal of this portion of the April 1, 2015 NOV.

17. The April 1, 2015 NOV letter referenced 567 IAC 43.5(2)"b", which requires the disinfection system to include either redundant components, including an auxiliary power supply with automatic start-up and alarm to ensure that disinfectant application is maintained continuously while water is being delivered to the distribution system or automatic shutoff of delivery of water to the distribution system whenever there is less than adequate residual disinfectant in the water. The NOV stated that it appeared that the disinfection system was currently unable to meet either of these requirements. In a letter dated April 23, 2015, Veenstra and Kimm, the Water Board's engineering consultant, concurred that flow can be and was pumped to the system when total residual was less than 1.5 mg/L. Veenstra and Kimm also recommended programming changes to the SCADA system and agreed to submit a plan of action to provide compliance with 567 IAC 43.5(2)"b". Veenstra and Kimm indicated via electronic mail on March 30, 2016, that the high service pump shutoff is in place and operational. Despite having this

shutoff, the shutoff is not ensuring that adequate disinfectant is maintained continuously while water is being delivered to the distribution system. The operators are overriding the shutoff to restart the plant and raise the chlorine levels.

18. On June 26, 2015, FO 5 sent the Water Board a NOV letter and inspection report for an inspection conducted on June 9, 2018 and June 18, 2015. The NOV letter and inspection report stated that the NOV was issued due to the water plant not meeting the disinfection requirements of 567 IAC 43.5(2) and 43.10(3). The inspection report indicated during the June 18, 2015 inspection, FO 5 viewed the spreadsheet used by the operators for calculating the CT time obtained. FO 5 observed that CT obtained had not been calculated since June 15, 2015 and that the operator-in-charge had been directed to do this on a daily basis in the past. This was stated to be a violation of 567 IAC 43.5(2)"a", which requires the total inactivation ratio to be calculated each day that the treatment plant is in operation.

19. The June 26, 2015 inspection report for the June 9 and June 18, 2015 inspection of the water treatment plant stated that there was a treatment technique violation pursuant to 567 IAC 43.10(3) due to changes to the water plant disinfection system that had not been authorized by FO 5. The water plant staff had relocated the clear well sample location for chlorine, turbidity, pH and temperature to a location that was described by the water plant operator-in-charge to the Department as more representative of the clear well content. On June 18, 2015, the operator-in-charge informed FO 5 that the new location was the mid-point within the clear well. It was also reported that on June 15, 2015, the piping from the sample pump to the sampler was reconfigured. The two chlorine analyzers, which were used for free available chlorine monitoring at the midpoint and free available chlorine monitoring at the end of the clear well, were observed to both be fed from the mid-point with one monitoring free available chlorine used for chlorine CT and the other monitoring total residual chlorine. The inspection report found that the new location for the free available chlorine residual measurement was no longer appropriate for the residual chlorine concentration required to be measured to calculate CT. The free chlorine residual must be measured after all the CT has been applied, which would be at the outlet of the clear well or suction side of the high service pumps or anywhere after that but prior to the ammonia and high pressure sodium hypochlorite feeds. The inspection report required that the monitoring point be relocated immediately to the end of the disinfection segment, which would be at the end of the clear well. The inspection report noted that "[b]y using the chlorine residual at the mid-point of the clear well, the contact time applied is essentially being cut in half, but CT obtained is still being calculated based on the full volume or original contact time." The inspection report noted that the system should have sought approval by the Department before instituting changes to disinfection practices. The inspection report found that there was a treatment technique violation for May and June 2015 due to this modification.

20. On July 22, 2015, FO 5 issued an NOV letter to the Water Board for a treatment technique violation. The NOV stated that the Water Board failed to obtain minimum

residual disinfectant concentration for the corresponding CT on June 17, 2015. The NOV found that due to this failure, the minimum disinfection treatment required by 567 IAC 43.5(2)"a" for surface water systems had not been met, which was a treatment technique violation. The NOV noted that the disinfection treatment requirement is to ensure adequate inactivation or removal of at least 99.9 % of *Giardia lamblia* cysts and 99.99 % of virus. The system's total inactivation ratio is required to be equal to or greater than 1.0 in order to ensure that the minimum inactivation and removal requirements have been achieved. An inactivation ratio of less than 1.0 was determined for June 17, 2015.

21. The July 22, 2015 NOV was issued to the Water Board for a treatment technique violation for not properly monitoring disinfection treatment during May, June and the first half of July 2015. This treatment technique violation began after the chlorine monitoring point was relocated in late April 2015 to a less representative location in the clear well. This was not corrected until July 16, 2015, the date on which the water system operator reported that the chlorine monitoring point had been returned to the original location at the end of the clear well. As the result of the change in the chlorine monitoring point, the data collected during this time period was not accurate to confirm that disinfection treatment was sufficient to ensure that the total treatment process of the system achieved the necessary inactivation and removal. The Water Board was required to issue public notice of the treatment technique violation to its customers.

Treatment Technique Violations for Turbidity

22. On July 15, 2014, FO 5 issued an NOV to the Water Board for failing to achieve less than 0.3 nephelometric turbidity unit (NTU) in 95 percent of the combined filter effluent measurements taken during June 2014. The NTU is a measurement of water clarity. Pursuant to the NOV "[t]he turbidity in the combined filter effluent must be less than or equal to 0.3 NTU in 95 % of the turbidity measurements taken each month. [567 IAC 43.10(4)] Combined filter effluent measurements for June 2014 showed that 26 percent of the turbidity measurements were over 0.3 turbidity units." The high turbidity measured and reported in the finished water was a concern since increased turbidity results in less efficient disinfection. The NOV required that the Water Board provide public notification.

23. On September 8, 2014, FO 5 issued an NOV to the Water Board for failing to achieve less than 0.3 NTU in 95 percent of the combined filter effluent measurements taken during July 2014. Approximately 10 percent of the turbidity measurements were over 0.3 NTU. The Water Board was required by the NOV to provide public notification.

24. On September 15, 2014, FO 5 issued an NOV to the Water Board for failing to achieve less than 0.3 NTU in 95 percent of the combined filter effluent measurements taken during August 2014. The Water Board was required by the NOV to provide public notification.

25. On April 1, 2015, FO5 issued an NOV to the Water Board for failing to notify the Department in a timely manner when finished turbidity levels exceeded 1 NTU and failing to adequately document compliance with turbidity monitoring requirements. On March 9, 2015, Mr. Covington notified FO 5 about finished water turbidity levels over 1 NTU. This level was originally noticed the day before, but additional turbidity levels over 1 NTU were actually tracked back as far as February 11, 2015. Upon further investigation there appeared to be multiple occurrences of the filtered water turbidity exceeding 1 NTU with no explanation during the time period referenced above. Because the raw turbidity data cannot be accessed to compare periods of high turbidity to the 15-minute read times, this system cannot document compliance with subparagraph 43.10(4)"a"(3). The violation was formally appealed on May 12, 2015, and public notification was not completed by May 4, 2015, as required. The CFE turbidimeter was replaced the end of March 2015.

26. On August 18, 2015, FO 5 issued a treatment technique violation to the Water Board for the combined filter effluent in June, 2015 having 93 percent of the turbidity measurement less than or equal to 0.3 NTU. The turbidity in the combined filter effluent must be less than or equal to 0.3 NTU in 95 percent of the turbidity measurements taken each month [567 IAC 43.10(4)].

27. On August 21, 2015, FO 5 issued a treatment technique violation to the Water Board for combined filter effluent measurements that were greater than 1.0 NTU on July 2, July 4 and July 16, 2015. Subparagraph 567 IAC 43.10(4)"a"(3) provides that the turbidity in the combined filter effluent must never exceed 1 NTU at any time during the month. The Water Board failed to timely notify the Department of these three exceedances as required by 567 IAC 43.10(6)"a"(2). This subparagraph requires that any time that turbidity exceeds 1 NTU, the facility is required to notify and consult with the Department as soon as practical, but no later than 24 hours after the exceedance is known.

Monitoring, Reporting, and Record Keeping Violations

28. On February 24, 2014, the WSOS issued an NOV for a monitoring violation. The Water Board failed to collect the quarterly disinfection byproduct samples from the distribution system during the third quarter 2013.

29. On May 30, 2014, FO 5 issued an NOV to the Water Board due to failure to report a combined filter effluent turbidity of greater than 1 NTU to the Department within 24 hours in March 2014, in violation of 567 IAC 43.10(6)"a". The combined filter effluent turbidity value was not reported on the MOR for March 2014 and was not called in to FO 5 for consultation within 24 hours as required. The NOV letter was sent with the report for a sanitary survey conducted on April 24, 2014. The report stated that the operator in charge was requested to submit a revised MOR during the sanitary survey. At the time of issuance of the NOV letter and report, FO 5 had not received the revised MOR. The report noted that the combined filter effluent was required to not exceed 1 NTU at any

time and that if it did, it needed to be reported to FO 5 within 24 hours. FO 5 contacted the operator in charge by email communication on June 27, 2014 and requested that the revised MOR for March 2014 be submitted.

30. On July 28, 2014, FO 5 issued an NOV to the Water Board for an inability to produce turbidity records.

31. On January 30, 2015, FO 5 issued an NOV to the Water Board for incorrectly conducting self-monitoring, failure to maintain turbidity and disinfection self-monitoring data and records for five years, and not calculating the CT inactivation ratio daily. The report of investigation noted that all source/entry point monitoring must be conducted at a representative location of the finished water after all treatment, five years of disinfection and turbidity self-monitoring data must be available in a form that allows easy retrieval and interpretation, and that the inactivation ratio for CT must be calculated for each day the treatment plant is in operation.

32. On April 1, 2015, FO 5 issued an NOV to the Water Board for violation of reporting requirements. The Water Board failed to notify the Department in a timely manner when finished turbidity levels exceeded 1 NTU and failed to adequately document compliance with turbidity monitoring requirements.

33. On June 26, 2015, FO 5 issued an NOV to the Water Board for failure to comply with record keeping requirements under 567 IAC 42.5(1). The information submitted for April and May 2015 for temperature, pH, clear well chlorine, clear well level, finished water flow, and backwash flow was not legible and was no longer retrievable due to the installation of the new SCADA system at the water plant. The information was requested in order to compare chlorine CT ratios for these months to the information reported on the monthly reports. The report of investigation noted that 567 IAC 42.5(1) requires that PWS systems must retain on the premises or at a convenient location near its premises, records of turbidity analyses for not less than five years. Examples of data required to be retained include, but are not limited to, recorder charges, logbooks, bench sheets, SCADA records, and electronic files.

34. On August 18, 2015, FO5 issued an NOV to the Water Board for not having the required self-monitoring records available for June 2015. The documentation was requested after the June 2015 MOR was submitted on June 10, 2015, and was never submitted. FO 5 requested information from the SCADA system that the operator in charge was unable to produce claiming that it was only available through Jetco, the company that sold and installed the SCADA system for the Water Board. Despite repeated requests by FO 5 for the information, Jetco did not provide the requested information to FO 5 until August 24, 2015. Subrule 567 IAC 42.5(1) requires public water supplies to retain records on its premises or at a convenient location near its premises and the data must be in a form that allows easy retrieval and interpretation.

35. On August 21, 2015, FO 5 issued an NOV to the Water Board for a record keeping violation. The NOV was issued due to the Water Board's failure to produce data to the Department to document compliance with turbidity requirements for July 2015. Subrule 42.5(1) requires PWS systems to retain records on its premises or at a convenient location near its premises. The NOV stated that these records include all data generated at the facility to comply with self-monitoring requirements, including turbidity, and must be in a form that allows easy retrieval and interpretation.

36. On September 1, 2015, FO 5 issued an NOV to the Water Board for failure to issue a comprehensive public notification for the treatment technique violations issued on July 22, 2015. The NOV letter required the Water Board to immediately provide public notification using the mandatory language provided by FO 5.

MOR Submittals

37. During a sanitary survey conducted at the water treatment plant on April 24, 2014, it was discovered that the operator in charge of the plant did not report the combined filter effluent of 1.017 NTU on the March 2014 MOR. The operator in charge additionally did not report this value, which exceeded the allowable value of 1 NTU, to FO 5 within 24 hours as required. At the time of the sanitary survey, the operator in charge was requested to submit a revised March 2014 MOR.

38. As of issuance of the May 30, 2014 NOV letter and sanitary survey report, the revised March 2014 MOR had not been submitted. The May 30, 2014 NOV letter to the Water Board indicated that this facility was being issued a "Notice of Violation: Reporting requirements for combined filter effluent turbidity monitoring [567 IAC 43.10(6)"a"]." The sanitary survey report required reporting any combined filter turbidity greater than 1 NTU within 24 hours.

39. Additional deficiencies in the Water Board's MORs included failure to report information such as a total residual chlorine level of less than 1.5 mg/L timely in October 2013, failure to meet a required CT ratio for December 2013 and June 2015, repeated failure to calculate CT on a daily basis, incidents occurring in March 2014 concerning CT and combined filter effluent reporting, and failure to maintain records associated with turbidity.

40. In April 2014, FO 5 staff learned that the CT ratio was not being calculated correctly. The April 2014 MOR did not have a complete calculated section V. The June 2014 MOR indicated that the lowest measured disinfectant residual was less than 1.5 mg/L but did not provide the duration of this event on the disinfectant page or the summary of the report. FO 5 had not been notified of this event by the next business day after the occurrence as required by Department rules. The July 2015 MOR did not report the lowest measured disinfectant residual at the source/entry point as less than 1.5 mg/L, which was reported to the Department on July 3, 2015. A revised MOR was submitted,

but the revised MOR still not state the duration of this event on the disinfectant page of the report.

41. On July 28, 2014, FO 5 sent a letter to the Water Board concerning the July 2, 2014 visit to the water treatment plant by a senior environmental specialist from FO 5 and a senior engineer from the WSES. This letter stated that the Department visit to the water treatment plant was made after FO 5 was notified of a turbidity exceedance on June 29, 2014. FO 5 staff reviewed the information provided and determined that no violation had occurred. The FO 5 letter to the Water Board noted that it appeared that there was a lack of understanding of surface water treatment and reporting requirements. The FO 5 letter stated it determined that the system would benefit from a visit that would include a review of the integrity of the turbidity data collected. The turbidity data visit also was conducted to confirm what the SCADA system was capable of and how the turbidimeters were performing.

42. During the July 2, 2014 water treatment plant visit, Department staff reviewed the daily self-monitoring test results for raw and finished water turbidity and the use of the Hach portable turbidimeter. The plant uses the portable turbidimeter to compare a finished grab sample to the online turbidimeter. It was determined that the portable turbidimeter had not been calibrated since the prior calibration on August 29, 2013. The report noted that Hach recommended that the portable turbidimeter be calibrated at least every three months. The report also noted that the online turbidimeters were calibrated every three months by Hach and last calibrated on May 7, 2014.

43. The July 28, 2014 report and NOV discussed efforts during the July 2, 2014 visit to review stored data on the water treatment plant's SCADA system. During this July 2, 2014 visit, staff was not able to retrieve the five years of raw data required by Department rules. The Water Board reported to the Department on July 11, 2014 that the SCADA system only stored 375 days of individual and combined filter effluent data and that Water Board staff was working with the SCADA representative to obtain the data from the personal computer used for data acquisition and storage. As of the July 28, 2014 Department report, the data had not been received by the Department. The Department's report required the facility to retain turbidity records for a period of five years on the premises and to submit five years of turbidity data based on Department rule requirements for data retention.

44. Department staff discussed the installation of the turbidimeters with Water Board staff to determine if the sampling locations for the turbidimeters were representative of the process performance and the sample flow rates through each turbidimeter. The Department's report required the water treatment plant to immediately make improvements to the clear well sample collection (strainer, sample flow, and pumping sample) for the online turbidimeter or use the combined effluent turbidimeter in the line prior to the clear well for compliance sampling. The Department's report noted that failure to maintain a recommended flow rate through the turbidimeters could cause a false

low turbidity reading and could result in a monitoring violation if not corrected. The Department's report required the water treatment plant to provide a flow rate of 250-750 mL/minute through the turbidimeters.

45. The July 28, 2014 report required that the Water Board develop and submit an updated calibration protocol for the continuous and portable turbidimeters. The report indicated that the elements of the calibration protocol for the online turbidimeters must include the method of calibration, calibration frequency, calibration standards, documentation, data collection, and data reporting. The report stated that a written standard operating procedure or guideline needed to be developed to ensure that maintenance items are performed and documented on a maintenance log or in the system's calibration protocol.

46. A calibration protocol was submitted on September 3, 2014. This protocol identified the CFE compliance point prior to the clear well at a location where current PLC/SCADA capabilities could not record the necessary compliance data. Another protocol was submitted on November 21, 2014, but was an older version that was developed by the previous superintendent and contained inaccurate information about the present location of the CFE compliance point and discussed in the present tense "new samples lines" that were actually installed in 2008. On March 27, 2015, another protocol was submitted. This protocol did not contain information on data collection or data reporting for the combined filter effluent and individual filter effluent turbidimeters. The Water Board contends that these are not needed elements of the protocol.

Certified Operators at the Water Plant

47. The July 28, 2014 report concerning the July 2, 2014 site visit discussed the performance of the operator in charge of the water treatment plant. The report stated that in the opinion of Department staff, the operator in charge did not have sufficient knowledge regarding the portable or online turbidimeters. The report stated that it is essential that all operations staff be familiar with the equipment used for compliance monitoring. It also provided that the direct responsible charge or operator in charge of the Chariton Water Works must have accountability for and performance of active, daily on-site operation of the plant and distribution system. The report reminded the Water Board that the facility must have a sufficient number of adequately trained and knowledgeable staff to operate the facility.

48. On June 26, 2015, FO 5 issued an NOV to the Water Board due to failure to have adequate certified operator staffing at the water plant. The inspection report issued along with the NOV stated that the water plant was operated by Mr. Linville and Mr. Savage, with daily oversight by the operator in charge of the plant. Mr. Savage is a grade I operator. The inspection report stated that an operator certification compliance plan that documented plans for Mr. Savage becoming certified as a grade 2 water treatment

operator had not been submitted to FO 5. This plan was required by the inspection report sent by FO 5 to the Water Board on January 30, 2015. The inspection report stated that "Mr. Savage must not be responsible for an operation shift at the treatment plant until he is certified as a grade 2 operator. [567 IAC 81.2(4) and 81.2(11)]"

49. The inspection report issued on June 26, 2015 stated that the operator compliance plan for Mr. Dickhoff, who was hired in early 2015, provided for him to have tested for grade 1 water treatment or distribution certification by May 20, 2015. Since Mr. Dickhoff had not taken the test, the Water Board was in violation of its compliance plan pursuant to 567 IAC 81.2(4) and 81.2(11). The inspection report noted that Mr. Dickhoff had spent very little time training at the water treatment plant and spent most of his time with the operator-in-charge or in the distribution system. The inspection report required the Water Board to have a minimum of a grade 2 water treatment operator at the water treatment plant when it is in operation and a minimum of a grade 1 water distribution operator available for operation of the water distribution system.

50. On October 5, 2015, FO5 issued an NOV to the Water Board for the failure to have a minimum of a grade 2 operator staffing the plant when it was in operation. The violation required an operator certification compliance plan by October 26, 2015 for Mr. Zach Bedford and Mr. Dickhoff. The plan was received October 21, 2015, and indicated that Mr. Bedford would achieve grade 2 water treatment certification by October 28, 2015. Mr. Bedford has not achieved grade 2 water treatment certification to date.

Construction Permit for Caustic Soda Addition at the Water Treatment Plant

51. The May 30, 2014 report for the April 24, 2014 sanitary survey found that the Water Board installed its caustic soda addition at the water treatment plant in the summer of 2013 without obtaining a construction permit from the Department's WSES. The Water Board added this chemical into the raw water line when the plant was having problems with manganese levels in the raw water. The sanitary survey report required the facility to submit an as-built application for a construction permit for the addition of this chemical injection process to the Department by July 1, 2014. The as-built application was submitted without the required construction permit fee.

52. The caustic soda feed was discontinued in December 2014. On February 9, 2015, the operator in charge indicated to the Department, "We have eliminated this feed location as it has no effect on treatment. No one here can explain why it was even begun." A letter was sent from the WSES to the Water Board on February 11, 2015, indicating the project was dropped from active status.

Self-Monitoring Data Integrity

53. On January 20, 2015, FO 5 and WSES staff conducted a disinfection data integrity visit to the water treatment plant. This was done to review current compliance and to confirm the accuracy of the disinfection monitoring data, including the determination of CT time. A second visit was made to the water treatment plant on January 29, 2015 to conduct sampling.

54. Department staff investigated the location of the finished water samples. Recent samples had been collected from the mop sink in the storage room by water treatment plant staff. During the January 20, 2015 visit, Department staff found that the mop sink was not in a correct location for the sampling and advised that the finished water sample be taken from the lab sink. The water treatment plant operators were required to investigate further where the lab sink was plumbed. At the time of a follow-up visit on January 29, 2015, a water treatment plant operator reported that water from the lab sink was not finished water. It was determined that the only representative tap for sampling finished water was the finished line feeding the raw pump building. The report stated that the operation permit required that all source/entry point monitoring requirements, including but not limited to radionuclides, IOC, SOC, VOC, atrazine, and TOC and all routine operational monitoring for source/entry point must be conducted on finished water after all treatment.

55. The Water Board adds ammonia to form chloramines for disinfectant residual. When asked what the free ammonia level was during the January 20, 2015 visit, the operator in charge responded that it was low, even though there was no testing equipment for free ammonia at the plant. It is generally recommended that free ammonia be limited to 0.10 mg/L or less when entering the distribution system to reduce the potential for nitrification and loss of disinfectant residual. FO 5 tested a distribution system sample for monochloramine and free ammonia and found that free ammonia was above the range of the instrument, or greater than 0.5 mg/L. Subsequent testing was performed by a certified laboratory and indicated a range of free ammonia from 0.64- 0.90 mg/L in the distribution system. Because these levels of free ammonia represent the potential for nitrification in the system, the operator in charge was asked to purchase testing equipment and begin testing the water leaving the plant to ensure that free ammonia did not exceed 0.10 mg/L. The operation permit will be modified to include testing for monochloramine and free ammonia.

56. During the January 20, 2015 visit, Department staff assessed the two active Hach CL 17 chlorine analyzers to ensure that a representative sample was being collected and that settings, reagents, maintenance, verification practices, and reporting to SCADA were adequate. The January 30, 2015 report for this visit required that flow rates be adjusted to fall within the recommended range of 200-500 mL/ minute. After the July 2014 turbidity data integrity visit, the operator in charge agreed to report sample flow volume measurements for the turbidimeters every other week. FO 5 received this data for

September and October 2014. FO 5 did not receive any further data until FO 5 requested by electronic mail on March 2, 2015, that the Water Works submit the data from November 2014 to the present. The report required the Water Board to begin including bi-weekly flow data for all continuous analyzers with MORs. The report strongly recommended that the Water Board modify the standard operating procedure submitted in response to the Department's July 28, 2014 report to include the sample flow through all online/ continuous analyzers.

57. Department subrule 567 IAC 43.5(4)"a"(5) for residual disinfectant analytical methodology requires that instruments used for continuous monitoring be verified with a grab sample measurement at least every five days. The January 30, 2015 Department report stated that there was no record that this had been done for the Water Boards' Hach CL 17 used to conduct this monitoring at the source/entry point. The report required the Water Board to submit weekly verification records comparing the Hach CL 17 result with a grab sample analyzed with the pocket colorimeter on MORs.

58. The January 30, 2015 report stated that at the time of the January 24, 2015 visit, no chlorine CT had been calculated for January 2015. The report referenced Department rule 567 IAC 43.5(2)"a", which requires that each water system calculate the inactivation ratio each day the treatment plant is in operation. The report noted that the system's total inactivation ratio was required to be equal to or greater than 1.0. If CT required and CT obtained are not calculated, then the ratio cannot be determined each day and it is not known whether the minimum inactivation and removal requirements have been met. The report required the Water Board to immediately begin to calculate the CT at the end of each day to ensure that appropriate disinfection is being accomplished.

59. The January 30, 2015 FO 5 report noted that the operator in charge submitted the December 2014 MOR and then submitted several revisions to that report. The last revised report submitted included data not previously considered. FO 5 issued the Water Board an NOV on January 30, 2015 for failure to conduct adequate self-monitoring and failing to calculate CT each day the water treatment plant was in operation. The NOV letter cited Department subrules 567 IAC 42 Appendix B, 567 IAC 43.5(2)"a" and 567 IAC 43.5(4)"a"(5) as support for the NOV. The FO 5 report issued on January 30, 2015 indicated that following review of the MORs for December 2014, FO 5 would be issuing an NOV for a treatment technique violation. On February 2, 2015, FO 5 issued the Water Board an NOV for a treatment technique violation for failure to obtain a minimum CT time.

60. Based on the observations of the July 2014 and January 2015 data integrity visits to the water treatment plant, FO 5 found that the Water Board is operating a non-viable PWS system. The January 30, 2015 FO 5 report included this determination. This report indicated that the Water Board is required to submit a viability assessment to the Department in accordance with Department rule 567 IAC 43.8(5)"a"(3). On February 27, 2015, the Water Board submitted a written response to the January 30, 2015 report

indicating the Viability Assessment was completed and would be finalized as of February 24, 2015. The Water Board submitted the viability assessment manual to the Department on May 28, 2015 for review.

IV. CONCLUSIONS OF LAW

1. Iowa Code section 455B.172 makes this Department the agency of the state to conduct the public water supply program. Iowa Code section 455B.171 defines a PWS system as a system for the provision of piped water for human consumption, if the system has at least fifteen service connections or regularly serves at least twenty-five individuals. Iowa Code sections 455B.173(3), (5), and (6) authorize the Environmental Protection Commission (Commission) to promulgate rules relating to the operation of PWS systems, to adopt drinking water standards to assure compliance with federal standards adopted pursuant to the federal Safe Drinking Water Act, and to adopt rules relating to monitoring, record keeping, and reporting requirements for any PWS system. The Commission adopted such rules at 567 IAC chapters 40- 43.

2. Rule 567 IAC 40.2(455B), further defines the phrase "public water supply" by defining "community water system" as a PWS which has at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents, consistent with federal regulations. A "noncommunity water system" is any other PWS. This facility is a community water system (CWS).

3. Iowa Code section 455B.183(1) provides as follows:

"It is unlawful to carry on any of the following activities without first securing a written permit from the director, or from a city or county public works department if the public works department reviews the activity under this section, as required by the department.

1. The construction, installation, or modification of any disposal system or public water supply system or part thereof or any extension or addition thereto...."

4. Department subrule 567 IAC 40.1(455B) requires a PWS system to obtain a specific permit from the Department for the construction, modification, and operation of a PWS system. Department subrule 567 IAC 43.3(3) requires written construction permits. "No person shall construct, install, or modify any project without first obtaining, or contrary to any condition of, a construction permit issued by the director...."

5. Rule 43.3 provides for PWS system construction. Subrule 43.3(1) requires facilities that do not meet Chapter 41 and 43 drinking water standards to make alterations in accordance with 43.3(2) necessary to comply with drinking water standards. The construction standards are referenced in 43.3(2)"a". The construction standards for PWS projects are the 10 States Standards as adopted through 2007 and the American Water Works Association (AWWA) standards adopted through 2010. These standards include design standards for the actual construction as well as the requirements for PERs and

plans and specifications. Subrule 43.2(5) provides for project planning and basis of design. This subrule requires that a PER to be submitted either in advance of the project or with the project. The PER is required to contain information and data necessary to determine the conformance of the project to construction and operation standards referenced in 43.3(2) and whether the project is adequate to supply water in sufficient quantity at a sufficient pressure and of a quality that will comply with Chapter 41 and Chapter 43 drinking water standards.

6. Rule 567 IAC 41.6(455B) pertains to the disinfection byproducts MCLs and monitoring requirements. Subrule 41.6(1)"a"(1) "establishes criteria under which CWS and NTNC public water supply systems that add a chemical disinfectant to the water in any part of the drinking water treatment process or which provide water that contains a chemical disinfectant must modify their practices to meet the MCLs listed in this rule and the maximum residual disinfectant levels (MRDL) and treatment technique requirements for disinfection byproduct precursors listed in 567—43.6(455B)."

7. A community water system using surface water and serving fewer than 10,000 persons was required to comply with the rules for disinfection byproducts MCLs maximum contaminant levels and monitoring requirements beginning January 1, 2004. See 41.6(1)"a"(3)"1". The current monitoring requirements are included the revised operation permit issued September 14, 2014 and the revised operation permit issued in conjunction with this order. The MCL for HAA5 is 0.060 mg/L while the MCL for TTHM is 0.080 mg/L pursuant to 41.6(1)"b"(1). A PWS system is required to meet these MCLs as a locational running annual average at each monitoring location pursuant to 41.6(1)"b"(2).

8. Department subrule 41.6(1)"c" lists the monitoring requirements for disinfection byproducts. A facility that is required to monitor under this provision or under 43.6(455B) is required to develop and implement a monitoring plan pursuant to subrule 41.6(1)"c"(1)"6".

9. Subrule 567 IAC 42.1(1) requires the owner or operator of a PWS system to give notice of all violations of public drinking water rules and for other situations as listed in the subrule. This includes violations or failure to comply with MCLs, treatment techniques, monitoring requirements, and testing procedures. The term "other situations" includes all situations determined by the Department to require a public notice such as failure to meet the terms of a compliance schedule, failure to comply with public notification requirements or consumer confidence requirements, failure to retain a certified operator in accordance with subrule 43.1(5), and failure to meet data and other reporting requirements.

10. Pursuant to subrule 567 IAC 42.1(1)"b", the PWS system must provide public notice to persons served by the water system in accordance with this rule. The notice is required to provide to the persons served by the water system a clear and readily

understandable explanation of the violation including when the violation or situation occurred, any potential adverse health effects from the violation or situation, what the system is doing to correct the violation or situation, when the water system expects to return to compliance or resolve the situation and the name, business address, and telephone number of the owner, operator, or designee of the system as a source of additional information.

11. Subrule 567 IAC 42.4(1)"c", provides that the PWS shall submit a certification stating that it has fully complied with public notification rules and a representative copy of the public notice provided to the Department within ten days of completion of the notice.

12. Subrule 567 IAC 42.4(3)"b"(1)3 provides:

Chlorine residual. A minimum free available chlorine residual of 0.3 mg/L or a minimum total available chlorine residual of 1.5 mg/L must be continuously maintained throughout the water distribution system, except for those points in the distribution system that terminate as dead ends or areas that represent very low use when compared to usage throughout the rest of the distribution system as determined by the department.

13. Subrule 42.5(1) requires PWS systems to retain analytical records on its premises or at a convenient location near its premises. Self-monitoring data must also be maintained at the facility for inspection by the Department in a form that allows easy retrieval and interpretation of this data. Microbiological and turbidity analyses made pursuant to 567 IAC chapters 41 and 43 are required to be kept for not less than five years. See 42.5(1)"a"(2)1.

14. Department subrule 567 IAC 43.5(1)"a" provides in part as follows.

"These rules apply to all public water supply systems using surface water or ground water under the direct influence of surface water, in whole or in part, and establish criteria under which filtration is required as a treatment technique. In addition, these rules establish treatment technique requirements in lieu of maximum contaminat levels for *Giardia lamblia*, heterotrophic plate count bacteria, *Legionella*, viruses and turbidity. Each public water system with a surface water source or a groundwater source under the direct influence of surface water must provide treatment of that source water which complies with these treatment technique requirements. Systems which serve at least 10,000 persons must also comply with the requirements of 567—43.9(455B). Systems which serve fewer than 10,000 persons must also comply with the requirements of 567—43.10(455B). The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

(1) At least 99.9 percent (3-log) removal or inactivation of *Giardia lamblia* cysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer."

15. Subrule 567 IAC 43.5(2) pertains to disinfection and subrule 567 IAC 43.5(2)"a" pertains to the disinfection system criteria. Subrules 567 IAC 43.5(2) and 567 IAC 43.5(2)"a" provide in part as follows:

43.5(2) *Disinfection.* All community and noncommunity public water supply systems using surface water or groundwater under the direct influence of surface water in whole or in part shall be required to provide disinfection in compliance with this subrule and filtration in compliance with 43.5(3). If the department has determined that filtration is required, the system must comply with any interim disinfection requirements the department deems necessary before filtration is installed. ... Failure to meet any requirement of this subrule after the applicable date specified in this subrule is a treatment technique violation. The disinfection requirements are as follows:

a. Disinfection treatment criteria. The disinfection treatment must be sufficient to ensure that the total treatment processes of that system achieve at least 99.9 percent (3-log) inactivation or removal of *Giardia lamblia* cysts and at least 99.99 percent (4-log) inactivation or removal of viruses, acceptable to the department. At least 0.5 log inactivation of *Giardia lamblia* cysts must be achieved through disinfection treatment even if the required inactivation or removal is met or exceeded through physical treatment processes. Each system is required to calculate the total inactivation ratio ($CT_{calculated}$/ $CT_{required}$) each day the treatment plant is in operation. The system's total inactivation ratio must be equal to or greater than 1.0 in order to ensure that the minimum inactivation and removal requirements have been achieved.

16. Department subrule 567 IAC 43.5(2)"b" provides as follows:

b. *Disinfection system.* The disinfection system must include:

(1) Redundant components, including an auxiliary power supply with automatic start-up and alarm to ensure that disinfectant is maintained continuously while water is being delivered to the distribution system, or

(2) Automatic shutoff of delivery of water to the distribution system whenever there is less than 0.3 mg/L of residual disinfection concentration in the water. If the department determines that automatic shutoff would cause unreasoanble risk or interfere with fire protection, the system must comply with 43.5(2)"b"(1).

17. Department subrule 567 IAC 43.5(2)"c" provides as follows:

c. *Residual disinfectant entering system.* The residual disinfectant concentration in the water entering the distribution system, measured as specified in 43.5(4)"a"(5) and 43.5(4)"b"(2), cannot be less than 0.3 mg/L free residual or 1.5 mg/L total residual chlorine for more than four hours.

18. Department subrule 43.5(4)"b"(1)- (2) provide monitoring requirements for PWS systems using a surface water source for turbidity and residual disinfection. This subrule provides in part as follows:

(1) Turbidity.

1. Routine turbidity monitoring requirements. Turbidity measurements as required by 43.5(3) must be performed on representative samples of the system's filtered water every four hours (or more frequently) that the system serves water to the public. A public water system may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a calibration protocol approved by the department and audited for compliance during sanitary surveys. Major elements of the protocol shall include, but are not limited to: method of calibration, calibration frequency, calibration standards, documentation, data collection and data reporting. ...

(2) Residual disinfection.

1. Residual disinfection entering the system. The residual disinfectant concentration of the water entering the distribution sytem shall be monitored continuously, and the lowest value recorded each day, except if there is a failure of the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but not to exceed five working days following the failure of the equipment. ...

19. Subrule 567 IAC 43.10(4)"a" addresses combined filter effluent turbidity requirements. This subrule provides in part as follows:

43.10(4) *Combined filter effluent turbidity requirements.* All systems using surface water or groundwater under the direct influence of surface water which serve fewer than 10,000 people must use filtration, and the turbidity limits that must be met depend upon the type of filtration used. ...

a. *Conventional filtration treatment or direct filtrat*ion.

(1) Turbidity must be measured in the combined filter effluent as described in paragraphs 43.5(4)"a" and "b."

(2) The turbidity in the combined filter effluent must be less than or equal to 0.3 NTU in 95 percent of the turbidity measurements taken each month.

(3) The turbidity in the combined filter effluent must never exceed 1 NTU at any time during the month.

(4) The monthly reporting requirements are listed in subrule 43.10(6).

20. Subrule 567 IAC 43.10(5) pertains to individual filter turbidity requirements. This subrule provides as follows:

43.10(5) *Individual filter turbidity requirements.* All systems utilizing conventional filtration or direct filtration must conduct continuous monitoring of turbidity for each individual filter. Records must be maintained according to subrule 43.10(7).

a. *Continuous turbidity monitoring requirements.* Following are the continuous turbidity monitoring requirements.

(1) Monitoring must be conducted using an approved method listed in paragraph 43.5(4)"a";

(2) Calibration of turbidimeters must be conducted using procedures specified by the manufacturer;

(3) Results of turbidity monitoring must be recorded at least every 15 minutes;

(4) Monthly reporting must be completed according to subrule 43.10(6); and

(5) Records must be maintained according to 43.10(7).

b. *Failure of continuous turbidity monitoring equipment.* If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four fours in lieu of continuous monitoring until the turbidimeter is back on-line. A system has a maximum of 14 days after failure to repair the equipment, or else the system is in violation. The system must notify the department within 24 hours of both when the turbidimeter was taken off line and when it was returned on-line.

...

e. *Requirements triggered by the individual filter turbidity monitoring data.* Systems are required to conduct additional activities based upon their individual filter turbidity monitoring data, as listed in this paragraph.

(1) If the turbidity of an individual filter (or the turbidity of the combined filter effluent for a system with one or two filters, pursuant to 43.10(5)"c") exceeds 1.0 NTU in two consecutive recordings taken 15 minutes apart, the system must report the following information in the monthly operation report to the department by the tenth of the following month:

1. The filter number(s);
2. Corresponding date(s);
3. Turbidity value(s) which exceeded 1.0 NTU; and
4. The cause of the exceedance(s), if known.

...

21. Subrule 43.10(6) provides the reporting requirements for combined filter effluent turbidity monitoring. Subrule 43.10(6)"a"(1) provides as follows:

a. *Combined filter effluent turbidity monitoring.*

(1) The following information must be reported in the monthly operation report to the department by the tenth day of the following month.

1. Total number of filtered water turbidity measurements taken during the month.
2. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the systems required 95th percentile limit.
3. The date and analytical result of any turbidity measurements taken during the month which exceeded the maximum turbidity limit for the system, in addition to the requirements of 43.10(6)"a"(2).

22. If there is an exceedance of the combined filter effluent maximum turbidity limit, the requirements of subrule 43.10(6)"a"(2) must be met. Subrule 43.10(6)"a"(2)1 provides as follows.

(2) For an exceedance of the combined filter effluent maximum turbidity limit, the following requirements must be met.

1. If at any time the turbidity exceeds 1 NTU in representative samples of filtered water in a system using conventional filtration treatment or direct filtration, the system must consult with the department as soon as practical, but no longer than 24 hours after the exceedance is known, in accordance with the public notification requirements under 567—subparagraph 42.1(3)"b"(3)

23. Iowa Code section 455B.223 provides that it shall be unlawful for any person, firm, corporation, municipal corporation, or other governmental subdivision or agency, operating a PWS system to operate such a system unless the competency of the operator to operate such plant or system is duly certified by the Director.

24. The Commission has adopted rules relating to certification requirements in 567 IAC Chapter 81. Subrule 43.1(5) provides that all community PWS systems must have a properly certified operator.

25. Subrule 567 IAC 43.1(5)"a", authorizes the Department to require a community water supply system to obtain a certified operator to be in direct responsible charge. "All community and nontransient noncommunity public water supply systems must have a certified operator in direct responsible charge of the treatment and distribution systems, in accordance with 567 Chapters 40 through 44 and 81."

26. Subrule 567 IAC 81.2(3) pertains to the operator-in-charge certification requirement. This subrule requires the operator in charge to hold a certificate of the same classification of the plant or water distribution system and of equal or higher grade than the grade designated for that plant or distribution system.

27. Paragraph 43.5(4)"a", requires that the measurements for pH, temperature, turbidity, and residual disinfectant concentration must be conducted by a Grade 2, 3, or 4 operator meeting the requirements of Chapter 81, any person under the supervision of a Grade 2, 3, or 4 operator meeting the requirements of Chapter 81, or a certified laboratory.

28. Subrule 43.8(5)"a"(2), requires that existing PWS systems categorized as being in significant noncompliance by the Department due to their history of failure to comply with drinking water standards, are required to complete a viability assessment for the Department's review and approval. "Significant noncompliance" means the failure to comply with any drinking water standard. See subrule 43.8(1). The viability assessment must address the areas of technical, financial, and managerial viability for a PWS system. The assessment must include evaluation of the following areas at a minimum. The PWS

system may be required to include additional information as directed by the Department. The viability of a system should be forecast for a twenty year period.

a. Technical Viability

(1) Supply sources and facilities,
(2) Treatment, and
(3) Infrastructure (examples: pumping, storage, and distribution).

b. Financial Viability.

(1) Capital and operating costs
(2) Revenue sources
(3) Contingency plans.

c. Managerial Viability

(1) Operation
(2) Maintenance
(3) Management
(4) Administration

V. ORDER

THEREFORE, the Department orders and the Water Board agrees to comply with the following provisions:

1. Comply with minimum CT requirements before the first customer (water plant service line);

2. Complete a special study to investigate the reason for low chlorine residuals at the source/entry point entering the distribution system and to develop an implementation solution within the time frame agreed upon by the parties, but by no later than January 31, 2017. Items that should be included are a study of the detention time to the finished water chlorine analyzer to ensure the sample is representative, a chlorine demand study on the clear well, and a demonstration of how the chlorine feed point following ammonia addition could be used to remedy this issue.

3. Complete any adjustments to the SCADA system upgrades installed in 2015 necessary in order to ensure all data generated at the facility is sufficient to comply with the self-monitoring requirements as directed by the Department and is maintained at the facility for inspection by the Department in a form that allows easy retrieval and interpretation. All data generated at the facility to comply with the self-monitoring requirements must be maintained at the facility for inspection by the Department and

must be in a form that allows easy retrieval and interpretation. Examples include, but are not limited to, recorder charts, log books, bench sheets, SCADA records, and electronic files as specified in 567 IAC 42.5(1)"g";

4. Maintain the services of a direct responsible charge operator who is a properly certified grade 3 water treatment and grade 2 water distribution operator and qualified water treatment and water distribution staff. All certified operation personnel, including the operator in charge, must have knowledge and experience in surface water treatment plant operation and maintenance and experience in trouble shooting surface water treatment plant problems. A minimum of a grade 2 water treatment operator must be at the water treatment plant when it is in operation.

5. Comply with all surface water treatment and turbidity requirements;

6. Comply with the TTHM and HAA5 MCLs and monitoring requirements.

7. Maintain an accurate calibration protocol for all online instrumentation that includes, but is not limited to method of calibration, calibration frequency, calibration standards, verification, documentation, data collection, and data reporting. This calibration protocol was approved by the Department's Field Office No. 5 on September 30, 2016. Prepare any revisions to the calibration protocol for all online instrumentation as required by Department staff within 30 days of each request for revision;

8. MORs are required to be completed accurately and correctly with all information required by the Department and submitted to FO 5 by the 10th of the month following the reporting month. Submit all required additional information, which includes but is not limited to sample line flow rate checks for all turbidimeters and chlorine analyzers, all end of the day read sheets, the monthly Excel summary, SCADA data in Excel format, excerpts from the written log book to support exceptions, and free ammonia, monochloramine, total residual chlorine, and nitrite self-monitoring results (including locations)for the distribution system to FO 5 to document the information on the submitted MORs and to confirm any of the information reported on the MOR by the 10th of each month. Subsequent self-monitoring data or information must be submitted within the timeframe requested by FO 5.

9. Conduct monitoring in accordance with the revised operation permit issued for this facility on September 18, 2015, as modified by the revised permit issued on May 24, 2016, and any future revised permits.

10. Maintain a revised system specific monitoring alert plan identifying baseline and action levels and appropriate corrective actions for total chlorine, monochloramine, free available ammonia, and nitrite as conditionally approved by the Department's FO 5 on September 30, 2016. FO 5 and the Water Works will continue to work together to finalize outstanding issues identified in the FO 5 review of the plan submitted by the

Water Board to comply with this provision. Prepare any revisions to the plan as required by Department staff within 30 days of each request for revision.

11. New construction permits for improvements may be denied until this system makes the required corrections and attains viable status in accordance with 567 IAC 43.8(7). You are advised the Drinking Water State Revolving Fund has special funding available that includes loan forgiveness of up to 75 percent for public health protection projects that return a system to viable status.

12. Perform public notification by November 1, 2016 in accordance with the treatment technique violation for turbidity monitoring issued on April 1, 2015.

13. The parties agree to dismissal of the appeal to the order.

14. This order assesses a $10,000.00 administrative penalty. Payment is due within 60 days after the Director signs this order.

VI. PENALTY

Iowa Code section 455B.191 authorizes the assessment of civil penalties of up to $5,000.00 per day of violation for the violations involved in this matter. Iowa Code section 455B.109 authorizes the Commission to establish by rule a schedule of civil penalties up to $10,000.00 that may be assessed administratively. The Commission has adopted this schedule with procedures and criteria for assessment of penalties in 567 IAC chapter 10. Pursuant to this chapter, the Department has determined that the most effective and efficient means of addressing the above-cited violations is the issuance of an order with an administrative penalty.

a. Economic Benefit. There have been cost savings to the facility. There have been cost savings by the Water Board by not improving the SCADA system at the water treatment plant timely, not addressing the treatment technique violations, not providing general housekeeping and maintenance at the water treatment plant, and not hiring experienced certified operators. There would otherwise have been expenditures for engineering, construction, chemicals, certified operators, equipment, operation, and maintenance costs. However, since water treatment plant improvements and subsequent capital expenditures will be necessary and since the cap on the administrative penalty per order is $10,000.00, no penalty will be assessed for this factor.

b. Gravity of the Violations. One of the factors to be considered in determining the gravity of the violations is the amount of penalty authorized by the Iowa Code for the types of violation. As indicated above, substantial civil penalties are authorized by statute. Despite the high penalties authorized, the Department has decided to handle the violations administratively at this time, as the most equitable and efficient means of resolving the matter.

The Department's drinking water program is intended to protect human health. While turbidity and chlorine CT have no health effects themselves, turbidity acts as a reliable surrogate or indicator for the presence of microbial pathogens in drinking water and chlorine CT ensures inactivation of such pathogens. In addition, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease causing organisms, especially if minimum inactivation ratios are not met. These organisms include bacteria, viruses, protozoa, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches, and can lead to death. Monitoring by the water system and submittal of accurate MORs is intended to demonstrate and document that the water system reliably achieves required pathogen control on a continuous basis. This PWS system has demonstrated repeatedly through treatment technique violations and inaccurate MORs that it has not been able to ensure quality drinking water to the citizens of Chariton. The health of the citizens potentially has been placed at risk in view of the operation of this PWS system.

Furthermore, the water treatment plant's SCADA system did not have the ability to provide turbidity and disinfection records as required until the recent upgrade to the system in summer 2015. The facility continues to have difficulty in providing to FO 5 the necessary documentation to support the information reported to the Department. The SCADA system is the only way to fully assess the system's accuracy in reporting. The amount of $5,000.00 is assessed for this factor, due to multiple violations and multiple submittals of revised MORs.

c. Culpability. The Department recognizes that the Water Board is a citizen's board. Despite this, the Water Board bears the responsibility to acquire sufficient knowledge of the PWS system in order to adequately supervise the performance of Mr. Covington and the other operators employed by the Water Board. The Water Board has the ultimate responsibility for this PWS system to ensure that safe drinking water is provided to the citizens of Chariton. The Water Board had a history of violations and entered into an administrative consent order with the Department in 2007 concerning violations. Despite training attended by the Water Board in the fall of 2014, a compliance meeting held with the Department during summer 2014, Department technical assistance visits to the water treatment plant in July 2014 and January 2015, and numerous NOV letters sent to the Water Board over the past several years, the Water Board continued to receive violations. The Water Board has been given ample time to comply with its permit and the rule requirements. Due to multiple violations, $5,000.00 is assessed for this factor.

VII. WAIVER OF APPEAL RIGHTS

Iowa Code section 455B.175, and 567 IAC chapter 7, authorize a written notice of appeal to the Commission. This consent amendment to the order is entered into knowingly by and with the consent of the Water Board. By signature to this consent

amendment to the order, all rights to appeal this consent amendment to the order are waived.

VIII. NONCOMPLIANCE

Compliance with Section V. of this consent amendment to the order constitutes full satisfaction of all requirements pertaining to the violations described in the order and this consent amendment to the order. Failure to comply with this consent amendment to the order may result in the imposition of administrative penalties pursuant to an administrative order or referral to the Attorney General to obtain injunctive relief and civil penalties pursuant to Iowa Code section 455B.191.

Roger Bingham

ROGER BINGHAM
CHAIRMAN, WATER BOARD
CHARITON MUNICIPAL WATER WORKS

Dated this 4 day of October, 2016

Chuck Gipp

CHUCK GIPP
DIRECTOR
IOWA DEPARTMENT OF NATURAL RESOURCES

Dated this 12th day of October, 2016

Water Board, Chariton Municipal Water Works, Water Supply Facility No. 5903011, Jeff Vansteenburg- Field Office No. 2, Janet Gastineau- Field Office No. 5, Anne Lynam- Water Supply Operations Section, Jennifer Bunton, P.E.- Water Supply Engineering Section, Diana Hansen- Legal Services Bureau, U.S.E.P.A. Region VII, II.B.2.a, II.B.2.d.

Copy to: Charles F. Becker, Belin McCormick, P.C., 666 Walnut Street, Suite 2000, Des Moines, Iowa 50309