TITLE 179 PUBLIC WATER SUPPLY SYSTEMS

CHAPTER 16 DISINFECTANTS AND DISINFECTION BYPRODUCTS

16-001 SCOPE AND AUTHORITY: This chapter applies to all community and non-transient, non-community water systems that add a chemical disinfectant to the water in any part of the drinking water treatment process, except for those systems that meet the time limitations for maintenance chlorination as defined in Attachment 1 which is hereby incorporated into these regulations. It also applies to transient non-community water systems that use chlorine dioxide as a disinfectant or oxidant. The authority is found in Neb. Rev. Stat. §§71-5301 to 71-5313.

16-001.01 Compliance Dates

1. Community Water Systems (CWSs) and Non-Transient Non-Community Water Systems (NTNCWSs): Unless otherwise noted, systems must comply with the requirements of this chapter as follows. Public water systems using surface water or ground water under the direct influence of surface water serving 10,000 or more ~~persons~~ individuals must comply with this chapter beginning January 1, 2002. Public water systems using surface water or ground water under the direct influence of surface water serving fewer than 10,000 ~~persons~~ individuals and systems using only ground water not under the direct influence of surface water must comply with this chapter beginning January 1, 2004.

2. Transient Non-Community Water Systems (NCWSs): Public water systems using surface water or ground water under the direct influence of surface water serving 10,000 or more ~~persons~~ individuals and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide in this chapter beginning January 1, 2002. Public water systems using surface water or ground water under the direct influence of surface water serving fewer than 10,000 ~~persons~~ individuals and using chlorine dioxide as a disinfectant or oxidant and systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide in this chapter beginning January 1, 2004.

16-002 DEFINITIONS

Enhanced coagulation means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

Enhanced softening means the improved removal of disinfection byproduct precursors by precipitative softening.

GAC10 means granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days, except that the reactivation frequency for GAC10 used as a best available technology for compliance with Title 179 NAC 24 MCLs (upon its effective date) under 179 NAC 2-002.04E2a(1) is 120 days.

Haloacetic acids (five) (HAA5) means the sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

Maximum residual disinfectant level (MRDL) means a level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. For chlorine and chloramines, a public water system (PWS) is in compliance with the MRDL when the running annual average of monthly averages of samples taken in the distribution system, computed quarterly, is less than or equal to the MRDL. For chlorine dioxide, a PWS is in compliance with the MRDL when daily samples are taken at the entrance to the distribution system and no two consecutive daily samples exceed the MRDL. MRDLs are enforceable in the same manner as maximum contaminant levels. There is convincing evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants. Notwithstanding the MRDLs listed in 179 NAC 2-002.~~02F1~~04F1, operators may increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections.

Maximum residual disinfectant level goal (MRDLG) means the maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants.

SUVA means Specific Ultraviolet Absorption at 254 nanometers (nm), an indicator of the humic content of water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV_{254}) (in m^{-1}) by its concentration of dissolved organic carbon (DOC) (in mg/L).

Total organic carbon (TOC) means total organic carbon in mg/L measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.

16-003 GENERAL REQUIREMENTS

16-003.01 The regulations in 179 NAC 16 establish criteria under which community water systems (CWSs) and non-transient, non-community water systems (NTNCWSs) which add a chemical disinfectant to the water in any part of the drinking water treatment process must modify their practices to meet maximum contaminant levels (MCLs) and MRDLs in 179 NAC 2-002.~~02E~~ 04E and 2-002.~~02F~~04F, and must meet the treatment technique requirements for disinfection byproduct precursors in 179 NAC 16-008.

16-003.02 The regulations in 179 NAC 16 establish criteria under which transient NCWSs that use chlorine dioxide as a disinfectant or oxidant must modify their practices to meet the MRDL for chlorine dioxide in 179 NAC 2-002.~~02F1~~04F1.

16-003.03 The Department has established MCLs for Total Trihalomethanes (TTHMs) and HAA5 and treatment technique requirements for disinfection byproduct precursors to limit the levels of known and unknown disinfection byproducts which may have adverse health effects. These disinfection byproducts may include chloroform; bromodichloromethane; dibromochloromethane; bromoform; dichloroacetic acid; and trichloroacetic acid.

16-003.04 Each CWS and NTNCWS must be operated by a ~~certified~~ licensed water operator who meets the requirements specified by the Department for the level of ~~certification~~ licensure required in 179 NAC 10 and is included in a Department list of ~~certified~~ licensed operators.

16-003.05 Control of Disinfectant Residuals: Notwithstanding the MRDLs in 179 NAC 2-002.~~02F~~04F, systems may increase residual disinfectant levels in the distribution system of chlorine or chloramines (but not chlorine dioxide) to a level and for a time necessary to protect public health, to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.

16-004 ANALYTICAL REQUIREMENTS

16-004.01 General

16-004.01A Systems must use only the analytical method(s) specified in 179 NAC 16-004, or ~~otherwise~~ their equivalent as approved by ~~the Department~~the United States Environmental Protection Agency (EPA) ~~for monitoring under 179 NAC 16,~~ to demonstrate compliance with the requirements of 179 NAC 16, 179 NAC 23, and 179 NAC 24 (upon their effective dates).

16-004.01B The following documents are incorporated herein by reference: They are available for viewing at the Division of Public Health of the Department of Health and Human Services ~~Regulation and Licensure, Public Health Assurance Division~~, 301 Centennial Mall South, Lincoln, NE 68509.

1. EPA Method 552.1 is in *Methods for the Determination of Organic Compounds in Drinking Water—Supplement II*, USEPA, August 1992, EPA/600/R-92/129 [(available through National Information Technical Service (NTIS), PB92-207703)], 5285 Port Royal Road, Springfield, VA 22161, (1-800-553-6847).

2. EPA Methods 502.2, 524.2, 551.1, and 552.2 are in the *Methods for the Determination of Organic Compounds in Drinking Water-Supplement III*, USEPA, August 1995, EPA/600/R-95/131 (available through NTIS, PB95-261616), 5285 Port Royal Road, Springfield, VA 22161, (1-800-553-6847).

3. EPA Method 300.0 is in *Methods for the Determination of Inorganic Substances in Environmental Samples*, USEPA, August 1993, EPA/600/R-93/100 (available through NTIS, PB94-121811), 5285 Port Royal Road, Springfield, VA 22161, (1-800-553-6847).

4. EPA Methods 300.1 and 321.8 is titled USEPA Method 300.1,are in *Methods for the Determination of Organic and Inorganic Anions Compounds in Drinking Water by Ion Chromatography*, Revision 1.0, USEPA, 1997, EPA/600/R-98/118 (available through NTIS, PB98-169196) 5285 Port Royal Road, Springfield, VA 22161, (1-800-553-6847); also available from: Chemical Exposure Research Branch, Microbiological & Chemical Exposure Assessment Research Division, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Cincinnati, OH 45268, Fax Number: 513-569-7757, Phone number: 513-569-7586. Volume 1, USEPA, August 2000, EPA 815-R-00-014 (available through NTIS, PB2000-106981, 5285 Port Royal Road, Springfield, VA 22151 (1-800-553-6847).

5. EPA Method 317.0, Revision 2.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis," USEPA, July 2001, EPA 815-B-01-001,

6. EPA Method 326.0, Revision 1.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis," USEPA, June 2002, EPA 815-R-03-007,

7. EPA Method 327.0, Revision 1.1, "Determination of Chlorine Dioxide and Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry," USEPA, May 2005, EPA 815-R-05-008 and

8. EPA Method 552.3, Revision 1.0, "Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-liquid Microextraction,

Derivatization, and Gas Chromatography with Electron Capture Detection," USEPA, July 2003, EPA-815-B-03-002 can be accessed and downloaded directly on-line at http://www.epa.gov/safewater/methods/sourcalt.html.

9.. EPA Method 415.3, Revision 1.1, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water," USEPA, February 2005, EPA/600-R-05/055 can be accessed and downloaded directly on-line at www.epa.gov/nerlcwww/ordmeth.htm.

~~5~~10. Standard Methods 4500-Cl D, 4500-Cl E, 4500-Cl F, 4500-Cl G, 4500-Cl H, 4500-Cl I, 4500-ClO_2D, 4500-ClO_2E, 6251 B, and 5910 B must be followed in accordance with *Standard Methods for the Examination of Water and Wastewater, 19th or 20th Edition*, American Public Health Association, 1995 and 1998 respectively.~~;~~ ~~copies~~ The cited methods published in either edition may be used. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC 20005.

~~6~~11. Standard ~~methods~~ Methods 5310 B, 5310 C, and 5310 D must be followed in accordance with the *Supplement to the 19th Edition of Standard Methods for the Examination of Water and Wastewater*, or the *Standard Methods for the Examination of Water and Wastewater*, 20th Edition, American Public Health Association, 1996 and 1998, respectively.; ~~copies~~ The cited methods published in either edition may be used. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC 20005.

~~7~~12. Standard Methods ~~(SM) on-line~~4500-Cl D-00, 4500-Cl E-00, 4500-Cl F-00, 4500-Cl G-00, 4500-Cl H-00, 4500-Cl I-00, 4500-ClO_2 E-00, 6251B-94, 5310 B-00, 5310 C-00, 5310 D-00 and 5910 B-00 are available at http://www.standardmethods.org or at EPA's Water Docket. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only Online versions that are IBR-approved.

~~8~~13. ASTM Methods D 1253-86 and D 1253-86 (Reapproved 1996) must be followed in accordance with the *Annual Book of ASTM Standards*, Volume 11.01, American Society for Testing and Materials International, 1996 or any ASTM edition containing the IBR (Institute for Basic Research)-approved version of the method may be used. ~~; copies~~ Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

~~9~~14. ASTM Method D 1253-03 must be followed in accordance with the *Annual Book of ASTM Standards*, Volume 11.01, American Society for Testing and Materials International, 2004 or any ~~year~~ ASTM edition containing the ~~cited~~ IBR-approved version of the method may be used.

Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

15. ASTM Method D 6581-00 must be followed in accordance with the *Annual Book of ASTM Standards* Volume 11.01, American Society for Testing and Materials International, 2001 or any ASTM edition containing the IBR-approved version of the method may be used. Copies may be obtained from the American Society for Testing and Materials International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

16-004.02 Disinfection Byproducts

16-004.02A Systems must measure disinfection byproducts by the methods (as modified by the footnotes) listed in the following table or an equivalent approved by EPA:

APPROVED METHODS FOR DISINFECTION BYPRODUCT COMPLIANCE MONITORING

~~Methodology[2]~~	~~EPA Method~~	~~Standard Method~~	~~Byproduct Measured[1]~~			
			~~TTHM~~	~~HAA5~~	~~Chlorite[4]~~	~~Bromate~~
~~P&T/GC/ EICD & PID~~	~~[3]502.2~~		~~X~~			
~~P&T/GC/MS~~	~~524.2~~		~~X~~			
~~LLE/GC/ECD~~	~~551.1~~		~~X~~			
~~LLE/GC/ECD~~		~~6251 B~~		~~X~~		
~~SPE/GC/ECD~~	~~552.1~~			~~X~~		
~~LLE/GC/ECD~~	~~552.2~~			~~X~~		
~~Amperometric Titration~~		~~4500-ClO_2E~~			~~X~~	
~~IC~~	~~300.0~~				~~X~~	
~~IC~~	~~300.1~~				~~X~~	~~X~~

Contaminant and methodology[1]	EPA method	Standard method[2]	SM online[9]	ASTM method[3]
TTHM P&T/GC/EICD & PID	502.2[4]			
P&T/GC/MS	524.2, 524.3[9]			
LLE/GC/ECD	551.1			
HAA5 LLE (diazomethane)/GC/ECD		6251 B[5,10]	6251 B-94	
SPE (acidic methanol)/GC/ECD	552.1[5]			
LLE (acidic methanol)/GC/ECD	552.2, 552.3			
Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry (IC-ESI-MS/MS)	557[11]			
Bromate Ion chromatography	300.1			

Ion chromatography & post column reaction IC/ICP-MS	317.0 Rev. 2.0[6], 326.0[6] 321.8[6 7]			
Two-Dimensional Ion Chromatography (IC)	302.0[12]			D 6581-00
Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry (IC-ESI-MS/MS)	557[13]			
Chemically Suppressed Ion Chromatography				D 6581-08 A
Electrolytically Suppressed Ion Chromatography				D 6581-08 B
Chlorite Amperometric titration	327.0 Rev. 1.1[8]	4500-ClO_2 E[8,10]	4500-ClO_2 E-00[8]	
Spectrophotometry Ion chromatography	300.0, 300.1, 317.0 Rev. 2.0, 326.0			D 6581-00
Chemically Suppressed Ion Chromatography				D 6581-08 A
Electrolytically Suppressed Ion Chromatography D 6581-08 B				

[1] ~~X indicates method is approved for measuring specified disinfection byproduct.~~

[21] P&T = purge and trap; GC = gas chromatography; EICD = electrolytic conductivity detector; PID = photoionization detector; MS = mass spectrometer; LLE = liquid/liquid extraction; ECD = electron capture detector; SPE = solid phase ~~extractor~~extraction; IC = ion chromatography; ICP-MS = inductively coupled plasma/mass spectrometer.

[2] 19th and 20th editions of *Standard Methods for the Examination of Water and Wastewater*, 1995 and 1998, respectively, American Public Health Association; either of these editions may be used.

[3] *Annual Book of ASTM Standards*, 2001 or any year containing the cited version of the method, Vol. 11.01

[3 4] If TTHMs are the only analytes being measured in the sample, then a PID is not required.

[5] The samples must be extracted within 14 days of sample collection.

[6] Ion chromatography and post column reaction or IC/ICP-MS must be used for monitoring of bromate for purposes of demonstrating eligibility of reduced monitoring, as prescribed in 179 NAC 16-005.02 item 3.b.

[7] Samples must be preserved at the time of sampling with 50 mg ethylenediamine (EDA)/L of sample and must be analyzed within 28 days.

[48] Amperometric titration or spectrophotometry may be used for routine daily monitoring of chlorite at the entrance to the distribution system, as prescribed in 179 NAC 16-005.02 item 2.a.(1). Ion chromatography must be used for routine monthly monitoring of chlorite and additional monitoring of chlorite in the distribution system, as prescribed in 179 NAC 16-005.02 items 2.a.(2) and 2.b.

[9] The Standard Methods Online version that is approved is indicated by the last two digits in the method number which is the year of approval by the Standard Method Committee. Standard Methods Online are available at http://www.standardmethods.org.

[10] Standard Methods for the Examination of Water and Wastewater, 21st edition (2005). Available from American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

[11] EPA Method 557. "Determination of Haloacetic Acids, Bromate, and Dalapon in Drinking Water by Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry (IC-ESI-MS/MS)," September 2009. EPA 815-B-09-012. Available at http://epa.gov/safewater/methods/analyticalmethods_ogwdw.html.

[12] EPA Method 302.0. "Determination of Bromate in Drinking Water using Two-Dimensional Ion Chromatography with Suppressed Conductivity Detection," September 2009. EPA 815-B-09-014. Available at http://epa.gov/safewater/methods/analytical methods_ogwdw.html.

16-004.02B Analysis under 179 NAC 16 for disinfection byproducts must be conducted by the Department Public Health Environmental Laboratory (certified by EPA) or a laboratory that has entered into an agreement with the Department Laboratory except as specified under 179 NAC ~~16-004.02C~~20. To receive certification to conduct analyses for the DBP contaminants in 179 NAC ~~2-002.02F1~~2-002.04E, 179 NAC 16-008, 179 NAC 23 (upon its effective date) and 179 NAC 24 (upon its effective date), the laboratory must:

1. ~~carry out annual analyses of~~Analyze performance evaluation (PE) samples ~~approved by EPA or~~that are acceptable to the ~~state~~Department at least once during each consecutive 12 month period by each method for which the laboratory desires certification.
2. The laboratory must achieve quantitative results on the PE sample analyses that are within the following acceptance limits:

~~In these analyses of PE samples, the laboratory must achieve quantitative results within the acceptance limit on a minimum of 80% of the analytes included in each PE sample. The acceptance limit is defined as the 95% confidence interval calculated around the mean of the PE study data between a maximum and minimum acceptance limit of +/-50% and +/-15% of the study mean.~~

Disinfection Byproduct	Acceptance limits (percent of true value)	Comments
TTHM		Laboratory must meet all 4 individual THM acceptance limits in order to successfully pass a PE sample for TTHMs
Chloroform	+20	
Bromodichloromethane	+20	
Dibromochloromethane	+20	
Bromoform	+20	
HAA5		Laboratory must meet the acceptance limits for 4 out of 5 of the HAA5 compounds in order to successfully pass a PE sample for HAA5
Monochloroacetic Acid	+40	
Dichloroacetic Acid	+40	
Trichloroacetic Acid	+40	
Monobromoacetic Acid	+40	
Dibromoacetic Acid	+40	
Chlorite	+30	
Bromate	+30	

3. Report quantitative data for concentrations at least as low as the ones listed in the following table for all DBP samples analyzed for compliance

with 179 NAC 2-002.04E, 179 NAC 16-008, and 179 NAC 23 (upon its effective date) and 179 NAC 24 (upon its effective date).

Disinfection Byproduct	Minimum reporting level (mg/L) [1]	Comments
TTHM [2] Chloroform Bromodichloromethane Dibromochloromethane Bromoform	 0.0010 0.0010 0.0010 0.0010	
HAA5 [2] Monochloroacetic Acid Dichloroacetic Acid Trichloroacetic Acid Monobromoacetic Acid Dibromoacetic Acid	 0.0020 0.0010 0.0010 0.0010 0.0010	
Chlorite	0.020	Applicable to monitoring as prescribed in 179 NAC 16-005.02 items 2.a(2) and 2.b.
Bromate	0.0050 or 0.0010	Laboratories that use EPA Methods 317.0 Revision 2.0, 326.0 or 321.8 must meet a 0.0010 mg/L MRL for bromate.

[1] The calibration curve must encompass the regulatory minimum reporting level (MRL) concentration. Data may be reported for concentrations lower than the regulatory MRL as long as the precision and accuracy criteria are met by analyzing an MRL check standard at the lowest reporting limit chosen by the laboratory. The laboratory must verify the accuracy of the calibration curve at the MRL concentration by analyzing an MRL check standard with a concentration less than or equal to 110% of the MRL with each batch of samples. The measured concentration for the MRL check standard must be +50% of the expected value, if any field sample in the batch has a concentration less than 5 times the regulatory MRL. Method requirements to analyze higher concentration check standards and meet tighter acceptance criteria for them must be met in addition to the MRL check standard requirement.
[2] When adding the individual trihalomethane or haloacetic acid concentrations to calculate the TTHM or HAA5 concentrations, respectively, a zero is used for any analytical result that is less than the MRL concentration for that DBP, unless otherwise specified by the Department.

16-004.02C A Grade I, II, III, or IV ~~certified~~ licensed water operator or a person who has been trained to take the samples must measure daily chlorite samples at the entrance to the distribution system. If a ~~certified~~ licensed operator does not take the sample~~, Attachment~~, Attachment 3, which is incorporated herein by reference must be completed and sent to the Department.

16-004.03 Disinfectant Residuals

16-004.03A Systems must measure residual disinfectant concentrations for free chlorine, combined chlorine (chloramines), and chlorine dioxide by the methods listed in the following table or an equivalent method approved by EPA:

APPROVED METHODS FOR DISINFECTANT RESIDUAL COMPLIANCE MONITORING

Methodology	~~Standard~~	SM Online	ASTM	EPA	Residual Measured[1]

	~~Method~~SM (19th, 20th or 21st ed)	[2]	Method	method	Free ~~Chlorine~~Cl_2	Combined ~~Chlorine~~Cl_2	Total ~~Chlorine~~Cl_2	~~Chlorine Dioxide~~ClO_2
Amperometric Titration	4500-Cl D	4500-Cl D-00	D 1253-86, (96), 03; D 1253-08		X	X	X	
Low Level Amperometric Titration	4500-Cl E	4500-Cl E-00					X	
DPD Ferrous Titrimetric	4500-Cl F	4500-Cl F-00			X	X	X	
DPD Colorimetric	4500-Cl G	4500-Cl G-00			X	X	X	
On-line Chlorine Analyzer				334.0[3]	X		X	
Amperometric Sensor[4]					X		X	
Syringaldazine (FACTS)	4500-Cl H	4500-Cl H-00			X			
Iodometric Electrode	4500-Cl I	4500-Cl I-00					X	
DPD	4500-ClO_2 D							X
Amperometric Method II	4500-ClO_2 E	4500-Cl O_2 E-00						X
Lissamine Green Spectro-photometric				327.0 Rev 1.1				X

[1] X indicates method is approved for measuring specified disinfectant residual. Free chlorine or total chlorine may be measured for demonstrating compliance with the chlorine MRDL and combined chlorine, or total chlorine may be measured for demonstrating compliance with the chloramine MRDL.
[2] The Standard Methods Online version that is approved is indicated by the last two digits in the method number which is the year of approval by the Standard Methods Committee. Standard Methods Online are available at http://www.standardmethods.org.
[3] EPA Method 334.0. "Determination of Residual Chlorine in Drinking Water Using an On-line Chlorine Analyzer," September 2009. EPA 815-B-09-013. Available at http://epa.gov/safewater/methods/analyticalmethods_ogwdw.html.
[4] ChloroSense. "Measurement of Free and Total Chlorine in Drinking Water by Palintest ChloroSense," August 2009. Available at http://www.nemi.gov or from Palintest Ltd, 21 Kenton Lands Road, PO Box 18395, Erlanger, KY 41018.

16-004.03B If approved by the Department, systems may also measure residual disinfectant concentrations for chlorine, chloramines, and chlorine dioxide by using DPD colorimetric test kits.

16-004.03C A Nebraska ~~certified~~ licensed Grade I, II, III, or IV operator or a person who has been trained to take the samples must measure residual disinfectant concentration. If the sample is not taken by a ~~certified~~ licensed operator, Attachment 3 to 179 NAC 16 must be completed and sent to the Department.

16-004.04 Additional Analytical Methods: Systems required to analyze parameters not included in 179 NAC 16-004.02 and 16-004.03 must use the following methods or an equivalent method approved by EPA. The Department Laboratory (certified by EPA) or a laboratory that has entered into an agreement with the Department Laboratory must analyze for the following parameters, except that pH may be analyzed by the Department Laboratory, or a laboratory that has entered into an agreement with the Department

Laboratory, or on-site by a Nebraska ~~certified~~ licensed Grade I, II, III, or IV operator or a person who has been trained on how to take the samples. If the sample is not taken by a ~~certified~~ licensed operator, Attachment 3 must be completed and sent to the Department.

1. Alkalinity: All methods allowed in 179 NAC 3-005.11A for measuring alkalinity.

2. Bromide: EPA Methods 300.0, ~~or EPA Method~~ 300.1, 317.0 Revision 2.0, 326.0 or ASTM D 6581-00.

3. Total Organic Carbon (TOC): Standard Method 5310 B or 5310 B-00 (High-Temperature Combustion Method) or Standard Method 5310 C or 5310 C-00 (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D or 5310 D-00 (Wet-Oxidation Method) or EPA Method 415.3 Revision 1.1 or Rev. 1.2, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water," August 2009. EPA/600/R-09/122. Available at http://www.epa.gov/nerlcwww/ordmeth.htm.. Inorganic carbon must be removed from the samples prior to analysis. TOC samples may not be filtered prior to analysis. TOC samples must ~~either be analyzed or must~~ be acidified at the time of sample collection to achieve pH less than or equal to 2~~.0 by~~with minimal addition of ~~phosphoric or sulfuric~~the acid specified in the method or by the instrument manufacturer. ~~as soon as practical after sampling, not to exceed 24 hours.~~ Acidified TOC samples must be analyzed within 28 days.

4. Specific Ultraviolet Absorbance (SUVA): SUVA is equal to the UV absorption at 254 nm (UV_{254}) (measured in m^{-1} divided by the dissolved organic carbon (DOC) concentration (measured as mg/L). In order to determine SUVA, it is necessary to separately measure UV_{254} and DOC. When determining SUVA, systems must use the methods stipulated in 179 NAC 16-004.04 item 4.a. to measure DOC and the method stipulated in 179 NAC 16-004.04 item 4.b. to measure UV_{254}. SUVA must be determined on water prior to the addition of disinfectants/oxidants by the system. DOC and UV_{254} samples used to determine a SUVA value must be taken at the same time and at the same location. SUVA may be calculated using DOC and UV_{254} data as found in EPA Method 415.3 Rev. 1.2, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water," August 2009. EPA/600/R-09/122. Available at http://www.epa.gov/nerlcwww/ordmeth.htm..

   a. Dissolved Organic Carbon (DOC): Standard Method 5310 B or 5310 B-00 (High-Temperature Combustion Method) or Standard Method 5310 C or 5310 C-00 (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D or 5310 D-00 (Wet-Oxidation Method) or EPA Method 415.3 Revision 1.1 or Rev. 1.2, Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water," August 2009. EPA/600/R-09/122. Available at http://www.epa.gov/nerlcwww/ordmeth.htm. ~~Prior to analysis,~~ DOC samples must be filtered through a 0.45 μm pore-

diameter filter as soon as practical after sampling, not to exceed 48 hours. ~~Water passed through the filter prior to filtration of the sample must serve as the filtered blank. This filtered blank must be analyzed using procedures identical to those used for analysis of the samples and must meet the following criteria: DOC < 0.5 mg/L. DOC samples must be filtered through the 0.45 µm pore-diameter filter prior to acidification.~~ After filtration, DOC samples must ~~either be analyzed or must~~ be acidified to achieve pH less than or equal to 2~~.0 by~~with minimal addition of ~~phosphoric or sulfuric~~the acid specified in the method or by the instrument manufacturer~~. as soon as practical after sampling, not to exceed 48 hours.~~ Acidified DOC samples must be analyzed within 28 days of sample collection. Inorganic carbon must be removed from the samples prior to analysis. Water passed through the filter prior to filtration of the sample must serve as the filtered blank. This filtered blank must be analyzed using procedures identical to those used for analysis of the samples and must meet the following criteria: DOC<0.5 mg/L.

b. Ultraviolet Absorption at 254 nm (UV_{254}): Standard Method 5910 B or 5910 B-00 (Ultraviolet Absorption Method) or EPA Method 415.3 Revision 1.1 or Rev. 1.2, Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water," August 2009. EPA/600/R-09/122. Available at http://www.epa.gov/nerlcwww/ordmeth.htm. UV absorption must be measured at 253.7 nm (may be rounded off to 254 nm). Prior to analysis, UV_{254} samples must be filtered through a 0.45 µm pore-diameter filter. The pH of UV_{254} samples may not be adjusted. Samples must be analyzed as soon as practical after sampling, not to exceed 48 hours.

5. pH: All methods allowed in 179 NAC 3-005.11A for measuring pH.

6. Magnesium. All methods allowed in 179 NAC 3-005.11A for measuring magnesium.

16-005 MONITORING REQUIREMENTS

16-005.01 General Requirements

1. Systems must take all samples during normal operating conditions.

2. Systems may consider multiple wells drawing water from a single aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required, with Department approval.

3. Failure to monitor in accordance with the monitoring plan required under 179 NAC 16-005.06 is a monitoring violation.

4. Failure to monitor will be treated as a violation for the entire period covered by the annual average where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MCLs or MRDLs.

5. Systems may use only data collected under the provisions of 179 NAC 16 to qualify for reduced monitoring.

16-005.02 Monitoring Requirements for Disinfection Byproducts

1. Total Trihalomethanes (THMs) and HAA5

a. Routine Monitoring: Systems must monitor at the frequency indicated in the following table:

ROUTINE MONITORING FREQUENCY FOR TTHM AND HAA5

Type of System	Minimum Monitoring Frequency	Sample Location in the Distribution System
Public water system using surface water or ground water under the direct influence of surface water serving at least 10,000 ~~persons~~individuals	Four water samples per quarter per treatment plant	At least 25% of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of ~~persons~~ individuals served, different sources of water, and different treatment methods.[1]
Public water system using surface water or ground water under the direct influence of surface water serving from 500 to 9,999 ~~persons~~individuals	One water sample per quarter per treatment plant	Locations representing maximum residence time[1]
Public water system using surface water or ground water under the direct influence of surface water serving fewer than 500 ~~persons~~individuals	One sample per year per treatment plant during month of warmest water temperature	Locations representing maximum residence time.[1] If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, the system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the system meets criteria in 179 NAC 16-005.02 item 1.d.
System using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 ~~persons~~individuals	One water sample per quarter per treatment plant[2]	Locations representing maximum residence time[1]

System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 ~~persons~~individuals	One sample per year per treatment plant[2] during month of warmest water temperature	Locations representing maximum residence time.[1] If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, the system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the system meets criteria in 179 NAC 16-005.02 item 1.d.

[1] If a system elects to sample more frequently than the minimum required, at least 25% of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

[2] Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with Department approval.

b. Systems may reduce monitoring, except as otherwise provided, in accordance with the following table:

REDUCED MONITORING FREQUENCY FOR TTHM AND HAA5

If You Are a . . .	**You May Reduce Monitoring If You Have Monitored At Least One Year and Your . . .**	**To This Level**
Public water system using surface water or ground water under the direct influence of surface water serving at least 10,000 ~~persons~~ individuals which has a source water annual average TOC level, before any treatment, ≤ 4.0 mg/L	TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L	One sample per treatment plant per quarter at distribution system location reflecting maximum residence time
Public water system using surface water or ground water under the direct influence of surface water serving from 500 to 9,999 ~~persons~~ individuals which has a source water annual average TOC level, before any treatment, ≤4.0 mg/L	TTHM annual average ≤0.040 mg/L and HAA5 annual average ≤0.030 mg/L	One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature. NOTE: Any public water system using surface water or ground water under the direct influence of surface water serving fewer than 500 ~~persons~~ individuals may not reduce its monitoring to less than one sample per treatment plant per year

System using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 ~~persons~~individuals	TTHM annual average ≤0.040 mg/L and HAA5 annual average ≤0.030 mg/L	One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature
System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 ~~persons~~individuals	TTHM annual average ≤0.040 mg/L and HAA5 annual average ≤0.030 mg/L for two consecutive years OR TTHM annual average ≤0.020 mg/L and HAA5 annual average ≤0.015 mg/L for one year	One sample per treatment plant per three year monitoring cycle at distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning on January 1 following quarter in which system qualifies for reduced monitoring

c. Monitoring Requirements for Source Water TOC: In order to qualify for reduced monitoring for TTHMs and HAA5s under 179 NAC 16-005.02 item 1.b., systems using surface water and ground water under the direct influence of surface water not monitoring under 179 NAC 16-005.04 must take monthly TOC samples every 30 days at a location prior to any treatment. In addition to meeting other criteria for reduced monitoring in 179 NAC 16-005.02 item 1.b., the source water TOC running annual average must be <4.0 mg/L (based on the most recent four quarters of monitoring) on a continuing basis at each treatment plant to reduce or remain on reduced monitoring for TTHMs and HAA5s. Once qualified for reduced monitoring for TTHMs and HAA5s under 179 NAC 16-005.02 item 1.b., a system may reduce source water TOC monitoring to quarterly TOC samples taken every 90 days at a location prior to any treatment.

~~c~~d. Systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for systems which must monitor quarterly) or the result of the sample (for systems which must monitor no more frequently than annually) is no more than 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively. Systems that do not meet these levels must resume monitoring at the frequency identified in 179 NAC 16-005.02 item 1.a. (minimum monitoring frequency column) in the quarter immediately following the monitoring period in which the system exceeds 0.060 mg/L ~~and~~ or 0.045 mg/L for TTHMs and HAA5, respectively. For systems using only ground water not under the direct influence of surface water and serving fewer than 10,000 ~~persons~~individuals, if either the TTHM annual average is >0.080 mg/L or the HAA5 annual average is >0.060 mg/L, the system must go to the increased monitoring identified in 179 NAC 16-005.02 item 1.a. (sample location column) in the quarter

immediately following the monitoring period in which the system exceeds 0.080 mg/L or 0.060 mg/L for TTHMs or HAA5, respectively.

~~d~~e. Systems on increased monitoring may return to routine monitoring if, after at least one year of monitoring their TTHM annual average is ≤0.060 mg/L and their HAA5 annual average is ≤0.045 mg/L.

~~e~~f. The Department may return a system to routine monitoring at the Department's discretion.

2. Chlorite: Community and non-transient non-community water systems using chlorine dioxide, for disinfection or oxidation, must conduct monitoring for chlorite.

a. Routine Monitoring

(1) Daily Monitoring: Systems must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the chlorite MCL, the system must take additional samples in the distribution system the following day at the locations required by 179 NAC 16-005.02 item 2.b., in addition to the sample required at the entrance to the distribution system.

(2) Monthly Monitoring: Systems must take a three-sample set each month in the distribution system. The system must take one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling must be conducted in the same manner (as three-sample sets, at the specified locations). The system may use the results of additional monitoring conducted under 179 NAC 16-005.02 item 2.b. to meet the requirement for monitoring in this paragraph.

b. Additional Monitoring: On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the system is required to take three chlorite distribution system samples at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

c. Reduced monitoring

(1) Chlorite monitoring at the entrance to the distribution system required by 179 NAC 16-005.02 item 2.a.(1) may not be reduced.

(2) Chlorite monitoring in the distribution system required by 179 NAC 16-005.02 item 2.a.(2) may be reduced to one three-sample set

per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under 179 NAC 16-005.02 item 2.a.(2) has exceeded the chlorite MCL and the system has not been required to conduct monitoring under 179 NAC 16-005.02 item 2.b. The system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken quarterly in the distribution system under 179 NAC 16-005.02 item 2.a.(2) exceeds the chlorite MCL or the system is required to conduct monitoring under 179 NAC 16-005.02 item 2.b., at which time the system must revert to routine monitoring.

3. Bromate

a. Routine Monitoring: Community and non-transient non-community systems using ozone, for disinfection or oxidation, must take one sample per month for each treatment plant in the system using ozone. Systems must take samples monthly at the entrance to the distribution system while the ozonation system is operating under normal conditions.

b. Reduced Monitoring~~:~~

(1) ~~Until March 31, 2009, Systems required to analyze for bromate may reduce monitoring from monthly to once per quarterguarterly, if the system's demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly bromide measurements for one year. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/L based upon representative monthly measurements. If the running annual average source water bromide concentration is >0.05 mg/L, the system must resume routine monitoring required by 179 NAC 16-005.02 item 3.a .~~

A system required to analyze for bromate may reduce monitoring from monthly to quarterly, if the system's running annual average bromate concentration is <0.0025 mg/L based on monthly bromate measurements under 179 NAC 16-005.02 item 3.a. for the most recent four quarters, with samples analyzed using Method 317.0 Revision 2.0, 326.0 321.8, 301.0 or 557. If a system has qualified for reduced bromate monitoring under 179 NAC 16-005.02 item 3.b.(1), that system may remain on reduced monitoring as long as the running annual average of quarterly bromate samples <0.0025 mg/L based on samples analyzed using Method 317.0 Revision 2.0, 326.0, 321.8, 301.0 or 557. If the running annual average bromate concentration is >0.0025 mg/L, the system must resume routine monitoring required by 179 NAC 16-005.02 item 3.a.

16-005.03 Monitoring Requirements for Disinfectant Residuals

1. Chlorine and Chloramines

a. Routine Monitoring: Community and non-transient non-community water systems that use chlorine or chloramines must measure the residual disinfectant level in the distribution system at the same point in the distribution system and at the same time as total coliforms (routine, repeat, and additionals, but not specials) are sampled. Public water systems using surface water or ground water under the direct influence of surface water may use the results of residual disinfectant concentration sampling conducted under 179 NAC 13-007.02F1 for unfiltered systems or 179 NAC 13-007.03C for systems which filter, in lieu of taking separate samples.

b. Reduced Monitoring: Monitoring may not be reduced.

2. Chlorine Dioxide

a. Routine Monitoring: Community, non-transient non-community, and transient non-community water systems that use chlorine dioxide for disinfection or oxidation must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, the system must take samples in the distribution system the following day at the locations required by 179 NAC 16-005.03 item 2.b. in addition to the sample required at the entrance to the distribution system.

b. Additional Monitoring: On each day following a routine sample monitoring result that exceeds the MRDL, the system is required to take three chlorine dioxide distribution system samples. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the system must take three samples as close to the first customer as possible, at intervals of at least six hours. If chlorine is used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), the system must take one sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

c. Reduced Monitoring: Chlorine dioxide monitoring may not be reduced.

16-005.04 Monitoring Requirements for Disinfection Byproduct Precursors (DBPP)

1. Routine Monitoring: Public water systems using surface water or ground water under the direct influence of surface water which use conventional filtration treatment as defined in 179 NAC 13-002 must monitor each treatment plant for TOC no later than the point of combined filter effluent turbidity monitoring and representative of the treated water. All systems required to monitor under this paragraph must also monitor for TOC in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as paired samples. At the same time as the source water sample is taken, all systems must monitor for alkalinity in the source water prior to any treatment. Systems must take one paired sample and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and influent water quality.

2. Reduced Monitoring: Public water systems using surface water or ground water under the direct influence of surface water with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year, may reduce monitoring for both TOC and alkalinity to one paired sample and one source water alkalinity sample per plant per quarter. The system must revert to routine monitoring in the month following the quarter when the annual average treated water TOC $\geq$2.0 mg/L.

16-005.05 Bromide: Systems required to analyze for bromate may reduce bromate monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly measurements for one year. The system must continue bromide monitoring to remain on reduced bromate monitoring.

16-005.06 Monitoring Plans: Each system required to monitor under 179 NAC 16 must develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the Department and the general public no later than 30 days following the applicable compliance dates specified in 179 NAC 16-001.01. All public water systems using surface water or ground water under the direct influence of surface water serving more than 3300 people must submit a copy of the monitoring plan to the Department no later than the date of the first report required under 179 NAC 16-007. The Department may also require the plan to be submitted by any other system. After review, the Department may require changes in any plan elements. The plan must include at least the following elements.

1. Specific locations and schedules for collecting samples for any parameters included in 179 NAC 16.

2. How the system will calculate compliance with MCLs, MRDLs, and treatment techniques.

3. If approved for monitoring as a consecutive system, or if providing water to a consecutive system, under the provisions of 179 NAC 3-010, the sampling plan must reflect the entire distribution system.

16-006 COMPLIANCE REQUIREMENTS

16-006.01 General Requirements

1. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system fails to monitor for TTHMs, HAA5, or bromate, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.

2. All samples taken and analyzed under the provisions of 179 NAC 16 must be included in determining compliance, even if that number is greater than the minimum required.

3. If, during the first year of monitoring under 179 NAC 16-005, any individual quarter's average will cause the running annual average of that system to exceed the MCL for total trihalomethanes, haloacetic acids (five), or bromate; or the MRDL for chlorine or chloramines, the system is out of compliance at the end of that quarter.

16-006.02 Disinfection Byproducts

1. TTHMs and HAA5

   a. For systems monitoring quarterly, compliance with MCLs in 179 NAC 2-002.~~02E~~ 04E must be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the system as prescribed by 179 NAC 16-005.02 item 1. If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to 179 NAC 4, in addition to reporting to the Department pursuant to 179 NAC 16-007. If a PWS fails to complete four consecutive quarters' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

   b. For systems monitoring less frequently than quarterly, systems demonstrate MCL compliance if the average of samples taken that year under the provisions of 179 NAC 16-005.02 item 1 does not exceed the MCLs in 179 NAC 2-002.~~02E~~04E. If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant and such system is not in violation of the MCL until it has completed one year of quarterly monitoring, unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the system is in

violation at the end of that quarter. Systems required to increase monitoring frequency to quarterly monitoring must calculate compliance by including the sample which triggered the increased monitoring plus the following three quarters of monitoring.

c. If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public, pursuant to 179 NAC 4, in addition to reporting to the Department pursuant to 179 NAC 16-007.

d. If a PWS fails to complete four consecutive quarters of monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

2. Bromate: Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system takes more than one sample, the average of all samples taken during the month) collected by the system as prescribed by 179 NAC 16-005.02 item 3. If the average of samples covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to 179 NAC 4, in addition to reporting to the Department pursuant to 179 NAC 16-007. If a PWS fails to complete 12 consecutive months' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

3. Chlorite: Compliance must be based on an arithmetic average of each three sample set taken in the distribution system as prescribed by 179 NAC 16-005.02 item 2.a.(2) and 16-005.02 item 2.b. If the arithmetic average of any three sample set exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to 179 NAC 4, in addition to reporting to the Department pursuant to 179 NAC 16-007.

16-006.03 Disinfectant Residuals

1. Chlorine and Chloramines

a. Compliance (with the MRDL) must be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under 179 NAC 16-005.03 item 1. If the average covering any consecutive four-quarter period exceeds the MRDL, the system is in violation of the MRDL and must notify the public pursuant to 179 NAC 4, in addition to reporting to the Department pursuant to 179 NAC 16-007.

b. In cases where systems switch between the use of chlorine and chloramines for residual disinfection during the year, compliance (with the MRDL) must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance.

Reports submitted pursuant to 179 NAC 16-007 must clearly indicate which residual disinfectant was analyzed for each sample.

c. Compliance with the minimum detectable residual is based on the requirements of Attachment 2 to 179 NAC 16.

2. Chlorine Dioxide

a. Acute Violations: Compliance must be based on consecutive daily samples collected by the system under 179 NAC 16-005.03 item 2. If any daily sample taken at the entrance to the distribution system exceeds the MRDL, and on the following day one (or more) of the three samples taken in the distribution system exceed the MRDL, the system is in violation of the MRDL and must take immediate corrective action to lower the level of chlorine dioxide below the MRDL and must notify the public pursuant to the procedures for acute health risks in 179 NAC 4 in addition to reporting to the Department pursuant to 179 NAC 16-007. Failure to take samples in the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system will also be considered an MRDL violation and the system must notify the public of the violation in accordance with the provisions for acute violations under 179 NAC 4 in addition to reporting to the Department pursuant to 179 NAC 16-007.

b. Nonacute Violations: Compliance must be based on consecutive daily samples collected by the system under 179 NAC 16-005.03 item 2. If any two consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL, the system is in violation of the MRDL and must take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and will notify the public pursuant to the procedures for nonacute health risks in 179 NAC 4 in addition to reporting to the Department pursuant to 179 NAC 16-007. Failure to monitor at the entrance to the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system is also an MRDL violation and the system must notify the public of the violation in accordance with the provisions for nonacute violations under 179 NAC 4 in addition to reporting to the Department pursuant to 179 NAC 16-007.

16-006.04 Disinfection Byproduct Precursors (DBPP): Compliance must be determined as specified by 179 NAC 16-008.03. Systems may begin monitoring to determine whether Step 1 TOC removals can be met 12 months prior to the compliance date for the system. This monitoring is not required and failure to monitor during this period is not a violation. However, any system that does not monitor during this period, and then determines in the first 12 months after the compliance date that it is not able to meet the Step 1 requirements in 179 NAC 16-008.02B and must therefore apply for alternate minimum TOC removal (Step 2) requirements, is not eligible for retroactive approval of alternate minimum TOC removal (Step 2) requirements as allowed pursuant to 179 NAC 16-

008.02C and is in violation. Systems may apply for alternate minimum TOC removal (Step 2) requirements any time after the compliance date. For systems required to meet Step 1 TOC removals, if the value calculated under 179 NAC 16-008.03A item 4 is less than 1.00, the system is in violation of the treatment technique requirements and must notify the public pursuant to 179 NAC 4, in addition to reporting to the Department pursuant to 179 NAC 16-007.

16-007 REPORTING AND RECORDKEEPING REQUIREMENTS

16-007.01 Systems required to sample quarterly or more frequently must report to the Department within 10 days after the end of each monitoring period in which samples were collected. Systems required to sample less frequently than quarterly must report to the Department within 10 days after the end of each monitoring period in which samples were collected.

16-007.02 Disinfection Byproducts: Systems must report the information specified in the following table:

If You Are a . . .	**You Must Report . . .**[1]
System monitoring for TTHMs and HAA5 under the requirements of 179 NAC 16-005.02 on a quarterly or more frequent basis.	(1) The number of samples taken during the last quarter. (2) The location, date, and result of each sample taken during the last quarter. (3) The arithmetic average of all samples taken in the last quarter. (4) The annual arithmetic average of the quarterly arithmetic averages of this section for the last four quarters. (5) Whether, based on 179 NAC 16-006.02 item 1, the MCL was violated.
System monitoring for TTHMs and HAA5 under the requirements of 179 NAC 16-005.02 less frequently than quarterly (but at least annually).	(1) The number of samples taken during the last year. (2) The location, date, and result of each sample taken during the last monitoring period. (3) The arithmetic average of all samples taken over the last year. (4) Whether, based on 179 NAC 16-006.02 item 1, the MCL was violated.
System monitoring for TTHMs and HAA5 under the requirements of 179 NAC 16-005.02 less frequently than annually.	(1) The location, date, and result of each sample taken. (2) Whether, based on 179 NAC 16-006.02 item 1, the MCL was violated.
System monitoring for chlorite under the requirements of 179 NAC 16-005.02.	(1) The number of entry point samples taken each month for the last 3 months. (2) The location, date, and result of each sample (both entry point and distribution system) taken during the last quarter. (3) For each month in the reporting period, the arithmetic average of all samples taken in each three sample set taken in the distribution system.

	(4) Whether, based on 179 NAC 16-006.02 item 3, the MCL was violated, in which month, and how many times it was violated each month.
System monitoring for bromate under the requirements of 179 NAC 16-005.02.	(1) The number of samples taken during the last quarter. (2) The location, date, and result of each sample taken during the last quarter. (3) The arithmetic average of the monthly arithmetic averages of all samples taken in the last year. (4) Whether, based on 179 NAC 16-006.02 item 2, the MCL was violated.

[1] The Department may choose to perform calculations and determine whether the MCL was exceeded, in lieu of having the system report that information.

16-007.03 Disinfectants: Systems must report the information specified in the following table:

If You Are a . . .	**You Must Report . . .**[1]
System monitoring for chlorine or chloramines under the requirements of 179 NAC 16-005.03.	(1) The number of samples taken during each month of the last quarter. (2) The monthly arithmetic average of all samples taken in each month for the last 12 months. (3) The arithmetic average of all monthly averages for the last 12 months. (4) Whether, based on 179 NAC 16-006.03 item 1, the MRDL was violated.
System monitoring for chlorine dioxide under the requirements of 179 NAC 16-005.03.	(1) The dates, results, and locations of samples taken during the last quarter. (2) Whether, based on 179 NAC 16-006.03 item 2, the MRDL was violated. (3) Whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or nonacute.

[1] The Department may choose to perform calculations and determine whether the MRDL was exceeded, in lieu of having the system report that information.

16-007.04 Disinfection Byproduct Precursors and Enhanced Coagulation or Enhanced Softening: Systems must report the information specified in the following table:

If You Are a . . .	**You Must Report . . .**[1]
System monitoring monthly or quarterly for TOC under the requirements of 179 NAC 16-005.04 and required to meet the enhanced coagulation or enhanced softening requirements in 179 NAC 16-008.02B or 16-008.02C.	(1) The number of paired (source water and treated water) samples taken during the last quarter. (2) The location, date, and results of each paired sample and associated alkalinity taken during the last quarter. (3) For each month in the reporting period that paired samples were taken, the arithmetic average of the

	percent reduction of TOC for each paired sample and the required TOC percent removal. (4) Calculations for determining compliance with the TOC percent removal requirements, as provided in 179 NAC 16-008.03A. (5) Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in 179 NAC 16-008.02 for the last four quarters.
System monitoring monthly or quarterly for TOC under the requirements of 179 NAC 16-005.04 and meeting one or more of the alternative compliance criteria in 179 NAC 16-008.01B or 16-008.01C.	(1) The alternative compliance criterion that the system is using. (2) The number of paired samples taken during the last quarter. (3) The location, date, and result of each paired sample and associated alkalinity taken during the last quarter. (4) The running annual arithmetic average based on monthly averages (or quarterly samples) of source water TOC for systems meeting a criterion in 179 NAC 16-008.01B, item 1 or 3, or of treated water TOC for systems meeting the criterion in 179 NAC 16-008.01B, item 2. (5) The running annual arithmetic average based on monthly averages (or quarterly samples) of source water SUVA for systems meeting the criterion in 179 NAC 16-008.01B, item 5, or of treated water SUVA for systems meeting the criterion in 179 NAC 16-008.01B, item 6. (6) The running annual average of source water alkalinity for systems meeting the criterion in 179 NAC 16-008.01B, item 3 and of treated water alkalinity for systems meeting the criterion in 179 NAC 16-008.01B, item 1. (7) The running annual average for both TTHMs and HAA5 for systems meeting the criterion in 179 NAC 16-008.01B, item 3 or 4. (8) The running annual average of the amount of magnesium hardness removal (as $CaCO_3$, in mg/L) for systems meeting the criterion in 179 NAC 16-008.01B, item 2. (9) Whether the system is in compliance with the particular alternative compliance criterion in 179 NAC 16-008.01B or 16-008.01C.

[1]The Department may choose to perform calculations and determine whether the treatment technique was met, in lieu of having the system report that information.

16-008 TREATMENT TECHNIQUE FOR CONTROL OF DISINFECTION BYPRODUCT (DBP) PRECURSORS

16-008.01 Applicability

16-008.01A Public water systems using surface water or ground water under the direct influence of surface water using conventional filtration treatment must operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in 179 NAC 16-008.02 unless the system meets at least one of the alternative compliance criteria listed in 179 NAC 16-008.01B or 16-008.01C.

16.008.01B Alternative Compliance Criteria for Enhanced Coagulation and Enhanced Softening Systems: Public water systems using surface water or ground water under the direct influence of surface water using conventional filtration treatment may use the alternative compliance criteria in 179 NAC 16-008.01B items 1 through 6 to comply with this section in lieu of complying with 179 NAC 16-008.02. Systems must still comply with monitoring requirements in 179 NAC 16-005.04.

1. The system's source water TOC level, measured according to 179 NAC 16-004.04 item 3, is less than 2.0 mg/L, calculated quarterly as a running annual average.

2. The system's treated water TOC level, measured according to 179 NAC 16-004.04 item 3, is less than 2.0 mg/L, calculated quarterly as a running annual average.

3. The system's source water TOC level, measured according to 179 NAC 16-004.04 item 3, is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity, measured according to 179 NAC 16-004.04 item 1, is greater than 60 mg/L (as $CaCO_3$), calculated quarterly as a running annual average; and either the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively; or prior to the effective date for compliance in 179 NAC 16-001.01, the system has made a clear and irrevocable financial commitment not later than the effective date for compliance in 179 NAC 16-001.01 to use of technologies that will limit the levels of TTHMs and HAA5 to no more than 0.040 mg/L and 0.030 mg/L, respectively. Systems must submit evidence of a clear and irrevocable financial commitment, in addition to a schedule containing milestones and periodic progress reports for installation and operation of appropriate technologies, to the Department for approval not later than the effective date for compliance in 179 NAC 16-001.01. These technologies must be installed and operating not later than June 30, 2005. Failure to install and operate these technologies by the date in the approved schedule will constitute a violation of these regulations.

4. The TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

5. The system's source water SUVA, prior to any treatment and measured monthly according to 179 NAC 16-004.04 item 4 is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

6. The system's finished water SUVA, measured monthly according to 179 NAC 16-004.04 item 4 is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

16.008.01C Additional Alternative Compliance Criteria for Softening Systems: Systems practicing enhanced softening that cannot achieve the TOC removals required by 179 NAC 16-008.02B may use the alternative compliance criteria in 179 NAC 16-008.01C items 1 and 2 in lieu of complying with 179 NAC 16-008.02. Systems must still comply with the monitoring requirements in 179 NAC 16-005.04.

1. Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as $CaCO_3$), measured monthly according to 179 NAC 16-004.04 item 1 and calculated quarterly as a running annual average.

2. Softening that results in removing at least 10 mg/L of magnesium hardness (as $CaCO_3$), measured monthly according to 179 NAC 16-004.04 item 6 and calculated quarterly as an annual running average.

16-008.02 Enhanced Coagulation and Enhanced Softening Performance Requirements

16-008.02A Systems must achieve the percent reduction of TOC specified in 179 NAC 16-008.02B between the source water and the combined filter effluent, unless the Department approves a system's request for alternate minimum TOC removal (Step 2) requirements under 179 NAC 16-008.02C.

16-008.02B Required Step 1 TOC reductions, indicated in the following table, are based upon specified source water parameters measured in accordance with 179 NAC 16-004.04. Systems practicing softening are required to meet the Step 1 TOC reductions in the far-right column (Source water alkalinity >120 mg/L) for the specified source water TOC:

STEP 1 REQUIRED REMOVAL OF TOC BY ENHANCED COAGULATION AND ENHANCED SOFTENING FOR PUBLIC WATER SYSTEMS USING SURFACE WATER OR GROUND WATER UNDER THE DIRECT INFLUENCE OF SURFACE WATER USING CONVENTIONAL TREATMENT[1,2]

Source-Water TOC, Mg/L	Source-Water Alkalinity, Mg/L as $CaCO_3$ (in Percentages)		
	0-60	**>60-120**	**>120[3]**
>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

[1] Systems meeting at least one of the conditions in 179 NAC 16-008.01B, items 1 to 6, are not required to operate with enhanced coagulation.
[2] Softening systems meeting one of the alternative compliance criteria in 179 NAC 16-008.01C are not required to operate with enhanced softening.
[3] Systems practicing softening must meet the TOC removal requirements in this column.

16-008.02C Public water systems using surface water or ground water under the direct influence of surface water as a source and having conventional treatment systems that cannot achieve the Step 1 TOC removals required by 179 NAC 16-008.02B due to water quality parameters or operational constraints must apply to the Department, within three months of failure to achieve the TOC removals required by 179 NAC 16-008.02B, for approval of alternative minimum TOC (Step 2) removal requirements submitted by the system. If the Department approves the alternative minimum TOC removal (Step 2) requirements, the Department may make those requirements retroactive for the purposes of determining compliance. Until the Department approves the alternate minimum TOC removal (Step 2) requirements, the system must meet the Step 1 TOC removals contained in 179 NAC 16-008.02B.

16-008.02D Alternate Minimum TOC Removal (Step 2) Requirements: Applications made to the Department by enhanced coagulation systems for approval of alternative minimum TOC removal (Step 2) requirements under 179 NAC 16-008.02C must include, at a minimum, results of bench- or pilot-scale testing conducted under 179 NAC 16-008.02D1. The submitted bench- or pilot-scale testing must be used to determine the alternate enhanced coagulation level.

16-008.02D1 Alternate enhanced coagulation level is defined as coagulation at a coagulant dose and pH as determined by the method described in 179 NAC 16-008.02D1 through 16-008.02D5 such that an incremental addition of 10 mg/L of alum (or equivalent amount of ferric salt) results in a TOC removal of $\leq$0.3 mg/L. The percent removal of TOC at this point on the "TOC removal versus coagulant dose" curve is then defined as the minimum TOC removal required for the system. Once approved by the Department, this minimum requirement supersedes the minimum TOC removal required by the table in 179 NAC 16-008.02B. This requirement will be effective until such time as the Department approves a new value based on the results of a new bench- and pilot-scale test. Failure to achieve Department-set alternative minimum TOC removal levels is a violation of these regulations.

16-008.02D2 Bench- or pilot-scale testing of enhanced coagulation must be conducted by using representative water samples and adding 10 mg/L increments of alum (or equivalent amounts of ferric salt) until the pH is reduced to a level less than or equal to the enhanced coagulation Step 2 target pH shown in the following table:

ENHANCED COAGULATION STEP 2 TARGET pH

Alkalinity (mg/L as $CaCO_3$)	**Target pH**
0-60	5.5

>60-120	6.3
>120-240	7.0
>240	7.5

16-008.02D3 For waters with alkalinities of less than 60 mg/L for which addition of small amounts of alum or equivalent addition of iron coagulant drives the pH below 5.5 before significant TOC removal occurs, the system must add necessary chemicals to maintain the pH between 5.3 and 5.7 in samples until the TOC removal of 0.3 mg/L per 10 mg/L alum added (or equivalent addition of iron coagulant) is reached.

16-008.02D4 The system may operate at any coagulant dose or pH necessary to achieve the minimum TOC percent removal approved under 179 NAC 16-008.02C.

16-008.02D5 If the TOC removal is consistently less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose at all dosages of alum (or equivalent addition of iron coagulant), the water is deemed to contain TOC not amenable to enhanced coagulation. The system may then apply to the Department for a waiver of enhanced coagulation requirements.

16-008.03 Compliance Calculations

16-008.03A Public water systems using surface water or ground water under the direct influence of surface water other than those identified in 179 NAC 16-008.01B or 16-008.01C must comply with requirements contained in 179 NAC 16-008.02B or 16-008.02C. Systems must calculate compliance quarterly, beginning after the system 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 either the table in 179 NAC 16-008.02B or from 179 NAC 16-008.02C).

3. Divide the value in 179 NAC 16-008.03A item 1 by the value in by 179 NAC 16-008.03A item 2.

4. Add together the results of 179 NAC 16-008.03A item 3 for the last 12 months and divide by 12.

5. If the value calculated in 179 NAC 16-008.03A, item 4 is less than 1.00, the system is not in compliance with the TOC percent removal requirements.

16-008.03B Systems may use the provisions in 179 NAC 16-008.03B items 1 through 5 in lieu of the calculations in 179 NAC 16-008.03A items 1 through 5 to determine compliance with TOC percent removal requirements.

1. In any month that the system's treated or source water TOC level, measured according to 179 NAC 16-004.04 item 3 is less than 2.0 mg/L, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 179 NAC 16-008.03A item 3) when calculating compliance under the provisions of 179 NAC 16-008.03A.

2. In any month that a system practicing softening removes at least 10 mg/L of magnesium hardness (as $CaCO_3$), the system may assign a monthly value of 1.0 (in lieu of the value calculated in 179 NAC 16-008.03A item 3) when calculating compliance under the provisions of 179 NAC 16-008.03A.

3. In any month that the system's source water SUVA, prior to any treatment and measured according to 179 NAC 16-004.04 item 4 is $\leq$2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 179 NAC 16-008.03A item 3) when calculating compliance under the provisions of 179 NAC 16-008.03A.

4. In any month that the system's finished water SUVA, measured according to 179 NAC 16-004.04 item 4 is $\leq$2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 179 NAC 16-008.03A item 3) when calculating compliance under the provisions of 179 NAC 16-008.03A.

5. In any month that a system practicing enhanced softening lowers alkalinity below 60 mg/L (as $CaCO_3$), the system may assign a monthly value of 1.0 (in lieu of the value calculated in 179 NAC 16-008.03A item 3) when calculating compliance under the provisions of 179 NAC 16-008.03A.

16-008.03C Public water systems using surface water or ground water under the direct influence of surface water using conventional treatment may also comply with the requirements of this section by meeting the criteria in 179 NAC 16-008.01B or 16-008.01C.

16-008.04 Treatment Technique Requirements for DBP Precursors: The Department identifies the following as treatment techniques to control the level of disinfection byproduct precursors in drinking water treatment and distribution systems: For public water systems using surface water or ground water under the direct influence of surface water using conventional treatment, enhanced coagulation or enhanced softening.

179 NAC 16 Attachment 1

I. TIME REQUIREMENTS TO DETERMINE NEED FOR TESTING UNDER DISINFECTANT/DISINFECTION BYPRODUCTS RULE

A. Time Periods – Public water systems using only groundwater sources that use chlorine, chloramines, chlorine dioxide, or ozone as any part of the treatment or system maintenance process are required to test for disinfection byproducts (DBPs) under the requirements of the Disinfectants/Disinfection Byproducts Rule unless levels of Total Organic Carbon (TOC) for all sources are $\leq$ 2 mg/L and the use of chlorine or chloramines is limited to usage for a period not longer than 30 consecutive days; or 45 total cumulative days for each calendar year.

B. Groundwater systems using chlorination for maintenance purposes as defined in I.A. above, or in response to a specific event in the distribution system are exempt from the disinfectant residual requirements set in Attachment 2 to 179 NAC 16.

C. Reporting – Public water systems using only groundwater that are adding chlorine or chloramines for maintenance purposes, or in response to a specific event in the distribution system, must submit a report for each month in which chlorine or chloramines are used. The report must contain the daily total flows, source of chlorine, percent of available chlorine, the pounds or gallons of solution added for each day, and an explanation of why the chemical was used. The report must be submitted within 10 days of the end of the month in which chlorine or chloramines were used.

D. Day of Disinfection Definition – Any portion of a 24 hour period, from 12:00 a.m. to 11:59 p.m., that chlorine or chloramines are added to the system's water is considered a day of disinfection. The total number of days of disinfection will be determined from the time the maintenance practice begins until the practice has ceased.

E. Regardless of the duration for which chlorine or chloramines are used, the Maximum Residual Disinfectant Level must not exceed 4.0 mg/L except as allowed in 179 NAC 16-003.05.

179 NAC 16 Attachment 2

Minimum Detectable Residuals

A. The following requirements establish the minimum allowable disinfectant residuals for each type of system.

1. For systems that are utilizing surface water sources, or sources determined to be groundwater under the direct influence of surface water, one of the following options must be implemented to meet the minimum residual requirements.

   a. 0.2 ppm residual for free chlorine or 0.5 ppm for total chlorine or
   b. 0.1 ppm residual for free chlorine or 0.25 ppm for total chlorine provided the requirements in Section C items 1-5 of this attachment are met or
   c. HPC of <500 cfu/ml.

2. All groundwater systems serving water to the public that contains chlorine or chloramines as a chemical disinfectant or oxidant on a continuous basis must use one of the following criteria for minimum residuals.

   a. 0.1 ppm residual for free chlorine or
   b. 0.05 ppm for free chlorine if qualifying criteria in section C items 3-5 of this attachment are met or
   c. HPC of <500 cfu/ml.

B. If a system is required to disinfect under an Administrative Order (AO), the requirements listed in the AO will supersede any requirements for minimum residuals established in this attachment.

C. In order for a system to maintain the lower minimum residual requirement for free or total chlorine (referred to in A, items 1.b. and 2.b.), the following criteria must be met:

1. Any public water system using surface water or ground water under the direct influence of surface water must meet or exceed all CT inactivation requirements in 179 NAC 13., Tables 13.1 to 13.8 at all times through the treatment process in order to utilize the lower requirements of A, item 1.b.

2. Any public water system using surface water, or ground water determined to be under the direct influence of surface water, must maintain effluent turbidity levels of less than or equal to 0.3 NTU in 95% of all readings, and at no time exceed 1 NTU. A system may submit a study to the Department showing that turbidity values in excess of the specified turbidity limits are a direct result of the treatment process and do not represent a threat to public health. The Department will review the study to determine the nature of the high turbidity levels and if they pose a threat to public health.

3. The system must demonstrate that the field test method being used can consistently, reliably, and precisely measure residuals less than or equal to the specified limit being used.

4. The system must document that the manufacturer's recommendations for calibration or standardization are being done according to manufacturer's specifications and frequency, and make this information available for review during sanitary surveys.

5. The system must demonstrate that there is no interference with the testing method, or document that interference has been corrected for. This can be done by any one of the following methods:

   a. Demonstration through historical source water data (a minimum of 12 months of data, or at least four quarterly samples for non-transient non-community systems) that no interference listed under the manufacturer's instructions is present in the system.

   b. Sampling for applicable interferences once each day that a residual disinfectant compliance sample(s) is taken to obtain a correction factor to be added to all residual compliance samples taken that day.

   c. Using an EPA approved method that provides a correction for interference as part of the procedure, and documenting all corrections.

   d. Adjusting all results based on stable historical data and adding the maximum interference obtained, with the Department's approval.

D. Disinfectant residuals must be at or above the required minimum residual limits in at least 95% of all distribution residuals taken for the month. If the system fails to meet the 95% requirement for two consecutive months, or for $\geq$ 50% of the previous 12 consecutive months, the system will be deemed to be in violation of prescribed treatment techniques and will be issued a Treatment Technique violation.

179 NAC 16 ATTACHMENT 3

Sampling Training For Individuals Other Than ~~Certified~~ Licensed Operators

PWS System or Community Name: _____

Name of person taking samples: _____

Parameter(s) sampled routinely by the above person:

_____

Trainer and Title: _____

Training material used: _____

Handouts given to the above person:

_____

I certify that on _____ I personally provided the necessary sampling
(Date)

training to assure quality data and approve the above person as qualified to perform the

above sampling tasks.

X_____
(Signature of Trainer) (~~Certification~~ License Number)

I certify that I did receive said training and I understand how to properly sample the above parameters.

X_____
(Signature of Approved Sampling Person)

When the above-named trained person no longer takes the samples the person has been trained to take, I will inform the Nebraska Department of Health and Human Services ~~Regulation and Licensure~~Division of Public Health, Field Services Program Manager at (402) 471-0521 within seven days. Acknowledged by System Owner or Operator in Charge:

X_____Date: _____
(Signature)
(Keep a copy for your records and submit original within seven days to ~~NHHS R&L~~DHHS, Division of Public Health~~,~~, Public Water Program at P. O. Box ~~95007~~95026, Lincoln, NE 68509-~~5007~~5026)