

WATERWORKS REGULATIONS

CHAPTER 590.

WATERWORKS REGULATIONS

Article 1.

Drinking Water Standards

12 VAC 5-590-370.Frequency.

The commissioner may exempt consecutive waterworks that obtain potable water from another water system for distribution from all monitoring requirements in this section except for bacteriological (subsection A) trihalomethanes (subdivision B 3), and lead and copper (subsection B 6). The required sampling frequencies are as follows:

Bacteriological.

A 1. The waterworks owner shall collect total coliform samples at sites which are representative of water throughout the distribution system according to a written sample siting report. The report shall be established or approved by the commissioner after investigation of the source, method of treatment and storage, and protection of the water concerned. The report must include, but is not limited to, the following:

A 1 a. The frequency of sampling distributed evenly throughout the month/quarter,

A 1 b. Distribution map showing the generalized location where specific sampling sites will be selected,

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A 1 c. Supporting statement explaining how specific individual sites are selected, how sampling will be rotated among the sites, how repeat samples will be collected and other information demonstrating that sampling will be conducted in a manner to comply with this chapter,

A 1 d. Adequate sampling points to provide sampling representative of all the conditions in the system,

A 1 e. For small systems (less than 3301 population), sample sites must also be identified by address and code number location,

A 1 f. Minimum of three sample locations for each sample required monthly so repeat sample locations are previously ascertained as being adequate in number and five customer service connections upstream and downstream. (See Appendix J for an example.)

A 1 g. The sampling point required to be repeat sampled shall not be eliminated from future collections based on a history of questionable water quality unless the sampling point is unacceptable as determined by the commissioner.

A 2. The minimum number of bacteriological samples for total coliform evaluation to be collected and analyzed monthly from the distribution system of a community or nontransient noncommunity waterworks shall be in accordance with Table 2.1. All

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noncommunity waterworks that use a surface water source or a groundwater source under the direct influence of surface water, and all large noncommunity (serving 1000 or more persons per day) waterworks, shall collect and submit samples monthly for analysis in accordance with Table 2.1. All other noncommunity waterworks shall submit samples for analysis each calendar quarter in accordance with Table 2.1.

A 3. The samples shall be taken at reasonably evenly spaced time intervals throughout the month or quarter.

If the results of a sanitary survey or other factors determine that some other frequency is more appropriate than that stated above, a modified sampling program report may be required. The altered frequency shall be confirmed or changed on the basis of subsequent surveys.

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Table 2.1

POPULATION SERVED	MINIMUM NUMBER
PER DAY	OF SAMPLES

(See 12 VAC 5-590-370 A 2)

25 to 1,000.....	1
1,001 to 2,500.....	2
2,501 to 3,300.....	3
3,301 to 4,100.....	4
4,101 to 4,900.....	5
4,901 to 5,800.....	6
5,801 to 6,700.....	7
6,701 to 7,600.....	8
7,601 to 8,500.....	9
8,501 to 12,900.....	10
12,901 to 17,200.....	15
17,201 to 21,500.....	20
21,501 to 25,000.....	25
25,001 to 33,000.....	30
33,001 to 41,000.....	40

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41,001 to 50,000.....50

50,001 to 59,000.....60

59,001 to 70,000.....70

70,001 to 83,000.....80

83,001 to 96,000.....90

96,001 to 130,000100

130,001 to 220,000120

220,001 to 320,000150

320,001 to 450,000180

450,001 to 600,000210

600,001 to 780,000240

780,001 to 970,000270

970,001 to 1,230,000300

1,230,001 to 1,520,000330

1,520,001 to 1,850,000360

1,850,001 to 2,270,000390

A 4. All bacteriological analyses shall be performed in accordance with 12 VAC 5-590-440 by the DCLS or by a laboratory certified by DCLS for drinking water samples.

B. Chemical. The location of sampling points, the chemicals measured, the frequency, and the timing of sampling within each compliance period shall be established or

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approved by the Commissioner. The Commissioner may increase required monitoring where necessary to detect variations within the waterworks. Analysis of field composite samples shall not be allowed. Samples for contaminants that may exhibit seasonal variations shall be collected during the period of the year when contamination is most likely to occur. Failure to comply with the sampling schedules in this section will require public notification pursuant to 12 VAC 5-590-540.

B 1. Inorganic chemical - Community and nontransient noncommunity waterworks owners shall conduct monitoring to determine compliance with the ~~PMCLs~~ MCLs in Table 2.2 in accordance with this section. All other noncommunity waterworks owners shall conduct monitoring to determine compliance with the nitrate and nitrite PMCLs in Table 2.2 (as appropriate) in accordance with this section. Monitoring shall be conducted as follows:

B 1 a. The owner of any groundwater source waterworks with 150 or more service connections shall take a minimum of one sample at each entry point to the distribution system which is representative of each source, after treatment, unless a change in conditions make another sampling point more representative of each source or treatment plant (hereafter called a sampling point) starting in the compliance period beginning January 1, 1993. The owner of any groundwater source waterworks with fewer than 150 service connections shall take a minimum of one sample at each sampling point for asbestos, barium, cadmium, chromium, fluoride, mercury, nitrate, nitrite, and selenium in the compliance period beginning January 1, 1993, and for antimony, beryllium, cyanide (as free cyanide), nickel, and thallium in the compliance period beginning January 1, 1996.

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B 1 b. The owner of any waterworks which uses a surface water source in whole or in part with 150 or more service connections shall take a minimum of one sample at each entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source, after treatment, unless a change in conditions make another sampling point more representative of each source or treatment plant (hereafter called a sampling point) beginning January 1, 1993. The owner of any waterworks which use a surface water source in whole or in part with fewer than 150 service connections shall take a minimum of one sample at each sampling point for asbestos, barium, cadmium, chromium, fluoride, mercury, nitrate, nitrite, and selenium beginning January 1, 1993, and for antimony, beryllium, cyanide (as free cyanide), nickel, and thallium beginning January 1, 1996.

B 1 c. If a waterworks draws water from more than one source and the sources are combined before distribution, the waterworks owner shall sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

B 1 d. The frequency of monitoring for asbestos shall be in accordance with subdivision B 1 d (1) of this section; the frequency of monitoring for barium, cadmium, chromium, fluoride, mercury, and selenium shall be in accordance with subdivision B 1 d (2) of this section; the frequency of monitoring for antimony, beryllium, cyanide (as free cyanide), nickel, and thallium shall be in accordance with subdivision B 1 d (3) of this section; the frequency of monitoring for nitrate shall be in accordance with subdivision B 1 d (4) of this section; the frequency of monitoring for nitrite shall be in accordance with subdivision B 1 d (5) of this section and; the

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frequency of monitoring for arsenic shall be in accordance with subdivision B 1 d (6) of this section.

B 1 d (1). The frequency of monitoring conducted to determine compliance with the PMCL for asbestos specified in Table 2.2 shall be conducted as follows:

B 1 d (1) (a). The owner of each community and nontransient noncommunity waterworks is required to monitor for asbestos during the first three-year compliance period of each nine-year compliance cycle beginning in the compliance period starting January 1, 1993.

B 1 d (1) (b). If the waterworks owner believes the waterworks is not vulnerable to either asbestos contamination in its source water or due to corrosion of asbestos-cement pipe, or both, the owner may apply to the Commissioner for a waiver of the monitoring requirement in subdivision B 1 d (1) (a) of this section. If the Commissioner grants the waiver, the waterworks owner is not required to monitor.

B 1 d (1) (c). The Commissioner may grant a waiver based on a consideration of the following factors:

B 1 d (1) (c) (i). Potential asbestos contamination of the water source, and

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B 1 d (1) (c) (ii). The use of asbestos-cement pipe for finished water distribution and the corrosive nature of the water.

B 1 d (1) (d). A waiver remains in effect until the completion of the three-year compliance period. Waterworks not receiving a waiver shall monitor in accordance with the provisions of subdivision B 1 d (1) (a) of this section

B 1 d (1) (e). The owner of a waterworks vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

B 1 d (1) (f). The owner of a waterworks vulnerable to asbestos contamination due solely to source water shall monitor sampling points in accordance with subdivision B 1 of this section.

B 1 d (1) (g). The owner of a waterworks vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

B 1 d (1) (h). The owner of a waterworks which exceeds the PMCL as determined in 12 VAC 5-590-410 2 of this chapter shall monitor quarterly beginning in the next quarter after the violation occurred.

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B 1 d (1) (i). The Commissioner may decrease the quarterly monitoring requirement to the frequency specified in subdivision B 1 d (1) (a) of this section provided the Commissioner has determined that the waterworks is reliably and consistently below the PMCL. In no case can the Commissioner make this determination unless the owner of a groundwater source waterworks takes a minimum of two quarterly samples or the owner of a waterworks which uses a surface water source in whole or in part takes a minimum of four quarterly samples.

B 1 d (1) (j). If monitoring data collected after January 1, 1990 are generally consistent with the requirements of subdivision B 1 d (1) of this section, then the Commissioner may allow waterworks owner to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

B 1 d (2). The frequency of monitoring conducted to determine compliance with the ~~PMCLs~~ MCLs in Table 2.2 for barium, cadmium, chromium, fluoride, mercury, and selenium shall be as follows:

B 1 d (2) (a). The owner of a groundwater source waterworks shall take one sample at each sampling point during each compliance period beginning in the compliance period starting January 1, 1993.

B 1 d (2) (b). The owner of a waterworks which uses a surface water source in whole or in part shall take one sample annually at each sampling point beginning January 1, 1993.

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B 1 d (2) (c). A waterworks owner may apply to the Commissioner for a waiver from the monitoring frequencies specified in subdivision B 1 d (2) (a) or B 1 d (2) (b) of this section.

B 1 d (2) (d). A condition of the waiver shall require that the waterworks owner shall take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

B 1 d (2) (e). The Commissioner may grant a waiver provided the owner of a waterworks which uses a surface water source in whole or in part has monitored annually for at least three years and groundwater waterworks have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since January 1, 1990.) The owner of any waterworks which uses a surface water source in whole or in part or a groundwater source waterworks shall demonstrate that all previous analytical results were less than the PMCL. Waterworks that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed.

B 1 d (2) (f). In determining the appropriate reduced monitoring frequency, the Commissioner shall consider:

B 1 d (2) (f) (i). Reported concentrations from all previous monitoring;

B 1 d (2) (f) (ii). The degree of variation in reported concentrations; and

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B 1 d (2) (f) (iii). Other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the waterworks configuration, changes in the waterworks operating procedures, or changes in stream flows or characteristics.

B 1 d (2) (g). A decision by the Commissioner to grant a waiver shall be made in writing and shall set forth the basis for the determination. The request for a waiver may be initiated by the Commissioner or upon an application by the waterworks owner. The owner shall specify the basis for the request. The Commissioner shall review and, where appropriate, revise the determination of the appropriate monitoring frequency when the waterworks owner submits new monitoring data or when other data relevant to the waterworks appropriate monitoring frequency become available.

B 1 d (2) (h). Owners of waterworks which exceed the PMCLs as calculated in 12 VAC 5-590-410 shall monitor quarterly beginning in the next quarter after the violation occurred.

B 1 d (2) (h) (i). The Commissioner may decrease the quarterly monitoring requirement to the frequencies specified in subdivision B 1 d (2) (a), B 1 d (2) (b), or B 1 d (2) (c) of this section provided a determination has been made that the waterworks is reliably and consistently below the PMCL. In no case can the Commissioner make this determination unless the owner of a groundwater source waterworks takes a minimum of two quarterly samples or the owner of a waterworks which uses a surface water source in whole or in part takes a minimum of four quarterly samples.

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B 1 d (3). The frequency of monitoring conducted to determine compliance with the PMCLs in Table 2.2 for antimony, beryllium, cyanide (as free cyanide), nickel, and thallium shall be as follows:

B 1 d (3) (a). The owner of a groundwater source waterworks with 150 or more service connections shall take one sample at each sampling point during each compliance period beginning in the compliance period starting January 1, 1993. The owner of a groundwater source waterworks with fewer than 150 service connections shall take one sample at each sampling point during each compliance period beginning in the compliance period starting January 1, 1996.

B 1 d (3) (b). The owner of a waterworks which uses a surface water source in whole or in part with 150 or more service connections shall take one sample annually at each sampling point beginning January 1, 1993. The owner of a waterworks which uses a surface water source in whole or in part with fewer than 150 service connections shall take one sample annually at each sampling point beginning January 1, 1996.

B 1 d (3) (c). A waterworks owner may apply to the Commissioner for a waiver from the monitoring frequencies specified in subdivision B 1 d (3) (a) or B 1 d (3) (b) of this section.

B 1 d (3) (d). A condition of the waiver shall require that the waterworks owner shall take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

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B 1 d (3) (e). The Commissioner may grant a waiver provided the owner of a waterworks which uses a surface water source in whole or in part has monitored annually for at least three years and groundwater waterworks have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since January 1, 1990.) The owner of any waterworks which uses a surface water source in whole or in part or a groundwater source waterworks shall demonstrate that all previous analytical results were less than the PMCL. Waterworks that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed.

B 1 d (3) (f). In determining the appropriate reduced monitoring frequency, the Commissioner shall consider:

B 1 d (3) (f) (i). Reported concentrations from all previous monitoring;

B 1 d (3) (f) (ii). The degree of variation in reported concentrations; and

B 1 d (3) (f) (iii). Other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the waterworks configuration, changes in the waterworks operating procedures, or changes in stream flows or characteristics.

B 1 d (3) (g). A decision by the Commissioner to grant a waiver shall be made in writing and shall set forth the basis for the determination. The request for a waiver may be initiated by the

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Commissioner or upon an application by the waterworks owner. The owner shall specify the basis for the request. The Commissioner shall review and, where appropriate, revise the determination of the appropriate monitoring frequency when the waterworks owner submits new monitoring data or when other data relevant to the waterworks appropriate monitoring frequency become available.

B 1 d (3) (h). Owners of waterworks which exceed the PMCLs as calculated in 12 VAC 5-590-410 shall monitor quarterly beginning in the next quarter after the violation occurred.

B 1 d (3) (i). The Commissioner may decrease the quarterly monitoring requirement to the frequencies specified in subdivision B 1 d (3) (a), B 1 d (3) (b) or B 1 d (3) (c) of this section provided a determination has been made that the waterworks is reliably and consistently below the PMCL. In no case can the Commissioner make this determination unless the owner of a groundwater source waterworks takes a minimum of two quarterly samples or the owner of a waterworks which uses a surface water source in whole or in part takes a minimum of four quarterly samples.

B 1 d (4). All community, nontransient noncommunity and noncommunity waterworks owners shall monitor to determine compliance with the PMCL for nitrate in Table 2.2.

B 1 d (4) (a). Owners of community and nontransient noncommunity waterworks which use a groundwater source shall monitor annually beginning January 1, 1993.

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B 1 d (4) (b). Owners of community and nontransient noncommunity waterworks which use a surface water source in whole or in part shall monitor quarterly beginning January 1, 1993.

B 1 d (4) (c). For community and nontransient noncommunity waterworks which use groundwater, the repeat monitoring frequency shall be quarterly for at least one year following any one sample in which the concentration is ≥ 50 percent of the PMCL. The Commissioner may allow the owner of a waterworks, which uses groundwater, to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than the PMCL.

B 1 d (4) (d). For community and nontransient noncommunity waterworks, the Commissioner may allow the owner of a waterworks which uses a surface water source in whole or in part, to reduce the sampling frequency to annually if all analytical results from four consecutive quarters are <50 percent of the PMCL. Such waterworks shall return to quarterly monitoring if any one sample is ≥ 50 percent of the PMCL.

B 1 d (4) (e). The owners of all other noncommunity waterworks shall monitor annually beginning January 1, 1993.

B 1 d (4) (f). After the initial round of quarterly sampling is completed, the owner of each community and nontransient noncommunity waterworks which is monitoring annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

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B 1 d (5). All community, nontransient noncommunity and noncommunity waterworks owners shall monitor to determine compliance with the PMCL for nitrite in Table 2.2.

B 1 d (5) (a). All waterworks owners shall take one sample at each sampling point in the compliance period beginning January 1, 1993.

B 1 d (5) (b). After the initial sample, the owner of any waterworks where an analytical result for nitrite is <50 percent of the PMCL shall monitor at the frequency specified by the Commissioner.

B 1 d (5) (c). The repeat monitoring frequency for any waterworks owner shall be quarterly for at least one year following any one sample in which the concentration is ≥ 50 percent of the PMCL. The Commissioner may allow a waterworks owner to reduce the sampling frequency to annually after determining the analysis results are reliably and consistently less than the PMCL.

B 1 d (5) (d). Owners of waterworks which are monitoring annually shall take each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.

B 1 d (6). The frequency of monitoring conducted to determine compliance with the PMCLs in Table 2.2 for arsenic shall be as follows:

B 1 d (6) (a). The owner of each community waterworks which use a surface water source in whole or in part shall take one sample annually at each sampling point beginning June 1, 1978.

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B 1 d (6) (b). The owner of each community groundwater waterworks shall take one sample at each sampling point within a three year period starting June 1, 1979.

B 1 d (6) (c). Owners of waterworks which exceed the PMCL listed in Table 2.2 shall report to the Commissioner within 7 days and initiate three additional samples at the same sampling point within one month.

B 1 d (6) (d). For initial analyses required by subdivision B 1 d (6) (a) or B 1 d (6) (b) of this section, data for waterworks which use surface water source in whole or in part acquired within 1 year prior to the effective date for arsenic monitoring and data for groundwater waterworks acquired within 3 year prior to the effective date for arsenic monitoring may be substituted at the discretion of the Commissioner.

B 2. Organic Chemicals. Owners of all community and nontransient noncommunity waterworks shall sample for organic chemical in accordance with their water source. Where two or more sources are combined before distribution, the waterworks owner shall sample at the entry point for the combined sources during periods of normal operating conditions.

B 2 a. Owners of waterworks which use groundwater shall take a minimum of one sample at each entry point to the distribution system which is representative of each source, after treatment, (hereafter called a sampling point).

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B 2 b. Owners of waterworks which use a surface water source in whole or in part shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system, after treatment, (hereafter called a sampling point).

B 2 c. The owner of each community and nontransient noncommunity waterworks shall take four consecutive quarterly samples for each contaminant listed in Table 2.3 - VOC 2 through 21 and SOC during each compliance period, beginning in the compliance period starting January 1, 1993.

B 2 d. Reduced Monitoring.

B 2 d (1). VOC

B 2 d (1) (a). If the initial monitoring for contaminants listed in Table 2.3 - VOC 1 through 8 and the monitoring for the contaminants listed in Table 2.3 - VOC 9 through 21 as allowed in subdivision B 2 d (1) (c) of this subsection has been completed by December 31, 1992, and the waterworks did not detect any contaminant listed in Table 2.3 - VOC 1 through 21, then the owner of each groundwater waterworks and waterworks which use a surface water source in whole or in part shall take one sample annually beginning January 1, 1993.

B 2 d (1) (b). After a minimum of three years of annual sampling, the Commissioner may allow the owner of a groundwater waterworks with no previous detection of any contaminant listed in

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Table 2.3 - VOC 2 through 21 to take one sample during each compliance period.

B 2 d (1) (c). The Commissioner may allow the use of monitoring data collected after January 1, 1988 for purposes of initial monitoring compliance. If the data are generally consistent with the other requirements in this section, the Commissioner may use these data (i.e., a single sample rather than four quarterly samples) to satisfy the initial monitoring requirement of subdivision B 2 c of this section. Waterworks which use grandfathered samples and did not detect any contaminants listed in Table 2.3 - VOC, 2 through 21, shall begin monitoring annually in accordance with subdivision B 2 d (1) (a) of this section beginning January 1, 1993.

B 2 d (2). SOC

B 2 d (2) (a). Waterworks serving more than 3,300 persons which do not detect a contaminant listed in Table 2.3 - SOC in the initial compliance period, may reduce the sampling frequency to a minimum of two quarterly samples in one year during each repeat compliance period.

B 2 d (2) (b). Waterworks serving less than or equal to 3,300 persons which do not detect a contaminant listed in Table 2.3 - SOC in the initial compliance period may reduce the sampling frequency to a minimum of one sample during each repeat compliance period.

B 2 e. Waiver Application.

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B 2 e (1). For VOCs - The owner of any community and nontransient noncommunity groundwater waterworks which does not detect a contaminant listed in Table 2.3 - VOC may apply to the Commissioner for a waiver from the requirements of subdivisions B 2 d (1) (a) and B 2 d (1) (b) of this section after completing the initial monitoring. A waiver shall be effective for no more than six years (two compliance periods). The Commissioner may also issue waivers to small systems for the initial round of monitoring for 1,2,4-trichlorobenzene.

B 2 e (2). For SOCs - The owner of any community and nontransient noncommunity waterworks may apply to the Commissioner for a waiver from the requirement of subdivision B 2 c and B 2 d (2) of this section. The waterworks owner shall reapply for a waiver for each compliance period.

B 2 f. A Commissioner may grant a waiver after evaluating the following factor(s): Knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the source. If a determination by the Commissioner reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.

B 2 f (1). Previous analytical results.

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B 2 f (2). The proximity of the waterworks to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a waterworks or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non-point sources for SOCs include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, home and gardens, and other land application uses.

B 2 f (3). The environmental persistence and transport of the contaminants listed in Table 2.3 VOC and SOC.

B 2 f (4). How well the water source is protected against contamination, such as whether it is a waterworks which uses a surface water source in whole or in part or whether it is a groundwater source waterworks. Groundwater source waterworks shall consider factors such as depth of the well, the type of soil, wellhead protection, and well structure integrity. Waterworks which use surface water in whole or in part shall consider watershed protection.

B 2 f (5). Special factors.

B 2 f (5) (a). For VOCs - the number of persons served by the waterworks and the proximity of a smaller waterworks to a larger waterworks.

B 2 f (5) (b). For SOCs - elevated nitrate levels at the waterworks supply source.

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B 2 f (5) (c). For SOCs - use of PCBs in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps, transformers, etc.).

B 2 g. Condition for Waivers.

B 2 g (1). As a condition of the VOC waiver the owner of a groundwater waterworks shall take one sample at each sampling point during the time the waiver is effective (i.e., one sample during two compliance periods or six years) and update its vulnerability assessment considering the factors listed in paragraph f of this section. Based on this vulnerability assessment the Commissioner shall reconfirm that the waterworks owner is non-vulnerable. If the Commissioner does not make this reconfirmation within three years of the initial determination, then the waiver is invalidated and the waterworks is required to sample annually as specified in subdivision B 2 f of this section.

B 2 g (2). The owner of any community and nontransient noncommunity waterworks which use surface water in whole or in part which does not detect a contaminant listed in Table 2.3 - VOC may apply to the Commissioner for a waiver from the requirements of subdivision B 2 d (1) (a) of this section after completing the initial monitoring. Waterworks meeting this criteria shall be determined by the Commissioner to be nonvulnerable based on a vulnerability assessment during each compliance period. Each waterworks receiving a waiver shall sample at the frequency specified by the Commissioner (if any).

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- B 2 g (3). There are no conditions to SOC waivers.
- B 2 h. If a contaminant listed in Table 2.3 - VOC 2 through 21 or SOC 1 through 33 is detected then (NOTE: detection occurs when a contaminant level exceeds the current detection limit as defined by EPA.)
- B 2 h (1). Each waterworks owner shall monitor quarterly at each sampling point which resulted in a detection.
- B 2 h (2). The Commissioner may decrease the quarterly monitoring requirement specified in subdivision B 2 h (1) of this section provided it has determined that the waterworks is reliably and consistently below the PMCL. In no case shall the Commissioner make this determination unless a groundwater waterworks takes a minimum of two quarterly samples and a waterworks which use surface water in whole or in part takes a minimum of four quarterly samples.
- B 2 h (3). If the Commissioner determines that the waterworks is reliably and consistently below the PMCL, the Commissioner may allow the waterworks to monitor annually. Waterworks which monitor annually shall monitor during the quarter(s) which previously yielded the highest analytical result.

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B 2 h (4). Waterworks which have three consecutive annual samples with no detection of a contaminant may apply to the Commissioner for a waiver for VOC as specified in subdivision B 2 e (1) and/or to SOC as specified in subdivision B 2 e (2) of this section.

B 2 h (5). Subsequent monitoring due to contaminant detection.

B 2 h (5) (a). Groundwater waterworks which have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each sampling point at which one or more of the two-carbon organic compounds was detected. If the results of the first analysis do not detect vinyl chloride, the Commissioner may reduce the quarterly monitoring frequency of vinyl chloride monitoring to one sample during each compliance period. Waterworks which use surface water in whole or in part are required to monitor for vinyl chloride as specified by the Commissioner.

B 2 h (5) (b). If monitoring results in detection of one or more of certain related contaminants (heptachlor and heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.

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B 2 i. Waterworks which violate the requirements of Table 2.3 for VOCs or SOCs, as determined by 12 VAC 5-590-410 3, shall monitor quarterly. After a minimum of four consecutive quarterly samples which show the waterworks is in compliance as specified in 12 VAC 5-590-410 3 and the Commissioner determines that the waterworks is reliably and consistently below the PMCL, the waterworks may monitor at the frequency and time specified in subdivision B 2 h (3) of this section.

B 3. Trihalomethanes. Samples for TTHM analyses shall be collected quarterly from all community and nontransient noncommunity waterworks which disinfect and serve 10,000 or more individuals. At least four samples for each treatment plant used by the waterworks must be collected using the following criteria: at least 25 percent of the samples shall be taken at locations within the distribution system reflecting the maximum residence time of the water in the system. The remaining 75 percent shall be taken at representative locations in the distribution system, taking into account the number of persons served, different sources of water and different treatment methods employed. Sample locations shall be approved by the Commissioner.

B 3 a. Community and nontransient noncommunity waterworks utilizing surface water in whole or in part, may, upon written request, have the monitoring frequency reduced by the commissioner to a minimum of one sample per quarter taken at a point of maximum residence time of the water in the distribution system. The commissioner must make a written determination that data from at least one year of monitoring and local conditions indicate that TTHM concentrations will be consistently below the PMCL.

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If at any time in the reduced monitoring program the results from any analysis exceed the PMCL for TTHMs and such results are confirmed by at least one check sample taken promptly after such results are received, or if the waterworks makes any significant change to its source of water or treatment program, the waterworks shall immediately begin monitoring in accordance with subdivision B 3 of this section. Routine monitoring must continue for at least one year before a reduced monitoring frequency can be implemented again.

B 3 b. Community and nontransient noncommunity waterworks utilizing groundwaters only, may, upon written request, have the monitoring frequency reduced to a minimum of one sample per year for TTHM. This sample shall be collected at a point in the distribution system reflecting the maximum residence time of the water. The commissioner must make a written determination that the data indicates the system has a TTHM concentration of less than the PMCL and local conditions indicate that TTHM concentrations will be consistently below the PMCL.

If at any time in the reduced monitoring program the results from any TTHM exceed or equal the PMCL and such results are confirmed by at least one check sample taken promptly after such results are received, the waterworks shall immediately begin monitoring in accordance with subdivision B 3 of this section. Routine monitoring must continue for at least one year before a reduced monitoring frequency can be implemented again.

If any significant change occurs in the raw water or if the waterworks treatment process is altered, an additional sample for TTHM shall be analyzed immediately to

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determine whether the waterworks must comply with the monitoring requirements of subdivision B 3 of this section. The sample shall be collected at a point in the distribution system reflecting the maximum residence time of the water.

B 3 c. Nothing shall prevent the Commissioner from requiring additional samples for TTHM or MTP analysis when conditions warrant.

B 3 d. Nothing shall prevent the TTHM regulations from being applicable to waterworks serving less than 10,000 individuals when in the determination of the Commissioner, public health will be better served.

B 3 e. With prior approval of the Commissioner, waterworks which utilize multiple wells from a common aquifer may consider these multiple sources as one treatment plant for determining the minimum number of samples to be collected for TTHM analysis.

B 3 f. All samples for TTHM or MTP taken within an established frequency shall be collected within a 24-hour period.

B 3 g. The results of all analyses per quarter shall be arithmetically averaged and reported to the Commissioner within 30 days of the owners receipt of the results (when samples are not analyzed by the State). All samples collected shall be used in the computation of the average unless the results are invalidated for technical reasons.

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B 3 h. Analysis shall be conducted in accordance with 12 VAC 5-590-440.

B 3 i. Before any modification to a waterworks is undertaken for the purposes of complying with this Section, approval must be obtained in accordance with 12 VAC 5-590-200. In addition, the following information, as a minimum, may be required from the owner:

B 3 i (1). An evaluation of the waterworks for sanitary defects and an evaluation of the source water for biological quality.

B 3 i (2). Evaluation of existing treatment practices and indication of how proposed improvements will minimize disinfectant demand and optimize finished water quality;

B 3 i (3). Provision of results of a baseline water quality survey. Parameters monitored should include coliform, fecal coliform, fecal streptococci, heterotrophic plate counts at 20°C and 35°C, phosphate, ammonia nitrogen and TOC. Virus studies may be necessary as determined by the Commissioner.

B 3 i (4). Performance of additional monitoring to assure continued maintenance of optimal biological quality in the finished water;

B 3 i (5). Consideration of a plan to maintain an active disinfectant residual throughout the distribution system at all times during and after proposed modifications.

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B 4. All community and nontransient noncommunity waterworks shall sample for the unregulated contaminants (UCs) listed in Table 2.5 and Table 2.7 as follows:

B 4 a. Table 2.6 - Group A

B 4 a (1). Owners of waterworks which use a surface water source in whole or in part shall sample at the entry points to the distribution system which is representative of each source, after treatment, (hereafter called a sampling point). The minimum number of samples is one year of consecutive quarterly samples per sampling point beginning in accordance with Table 2.8.

B 4 a (2). Owners of waterworks which use groundwater shall sample at points of entry to the distribution system which is representative of each source (hereafter called a sampling point). The minimum number of samples is one sample per sampling point beginning in accordance with Table 2.8.

B 4 a (3). The Commissioner may require a confirmation sample for positive or negative results.

B 4 a (4). Waterworks serving less than 150 connections may inform the Commissioner, in writing, that their waterworks is available for sampling instead of performing the required sampling.

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B 4 a (5). All waterworks required to sample under this section shall repeat the sampling at least every five years.

B 4 b. Table 2.6 – Group B and Table 2.7

B 4 b (1). The owner of each community and nontransient noncommunity waterworks owner shall take four consecutive quarterly samples at the entry points to the distribution system which is representative of each source (hereafter called a sampling point) for each contaminant listed in Table 2.6 Group B and report the results to the Commissioner. Monitoring shall be completed by December 31, 1995.

B 4 b (2). The owner of each community and nontransient noncommunity waterworks shall take one sample at each sampling point for each contaminant listed in Table 2.7 of this section and report the results to the Commissioner. Monitoring shall be completed by December 31, 1995.

B 4 b (3). The owner of each community and nontransient noncommunity waterworks may apply to the Commissioner for a waiver from the monitoring requirements of subdivision B 4 b (1) and B 4 b (2) of this section for the contaminants listed in Table 2.6 Group B and Table 2.7.

B 4 b (4). The Commissioner may grant a waiver for the requirement of subdivision B 4 b (1) of this section based on the criteria specified in subdivision B 2 f of this section. The

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Commissioner may grant a waiver from the requirement of subdivision B 4 b (2) of this section if previous analytical results indicate contamination would not occur, provided this data was collected after January 1, 1990.

B 4 b (5). If the waterworks utilizes more than one source and the sources are combined before distribution, the waterworks shall sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

B 4 b (6). The Commissioner may require a confirmation sample for positive or negative results.

B 4 b (7). Instead of performing the monitoring required by this section, the owner of a community waterworks or nontransient noncommunity waterworks serving fewer than 150 service connections may send a letter to the Commissioner stating that the waterworks is available for sampling. This letter shall be sent to the Commissioner by January 1, 1994. The waterworks shall not send such samples to the Commissioner, unless requested to do so by the Commissioner.

B 4 b (8). All waterworks required to sample under this section shall repeat the sampling at least every five years.

B 5. Reserved.

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B 6. Lead and Copper - The owners of all Community and Nontransient Noncommunity Waterworks shall monitor for lead and copper in tap water (subdivision B 6 a), water quality (corrosion) parameters in the distribution system and at entry points (subdivision B 6 a), and lead and copper in water supplies (subdivision B 6 a). The monitoring requirements contained in this section are summarized in Appendix M.

B 6 a. Monitoring requirements for lead and copper in tap water.

B 6 a (1). Sample site location

B 6 a (1) (a). By the applicable date for commencement of monitoring under subdivision B 6 a (4) (a), each waterworks owner shall complete a materials evaluation of the distribution system in order to identify a pool of targeted sampling sites that meets the requirements of this section, and which is sufficiently large to ensure that the owner can collect the number of lead and copper tap samples required in subdivision B 6 a (3). All sites from which first draw samples are collected shall be selected from this pool of targeted sampling sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.

B 6 a (1) (b). A waterworks owner shall use the information on lead, copper, and galvanized steel that the owner is required to collect when conducting a materials evaluation (reference Appendix B Corrosion). When this evaluation is insufficient to locate the requisite number of lead and copper

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sampling sites that meet the targeting criteria of this section, the owner shall review the sources of information listed below in order to identify a sufficient number of sampling sites. In addition, the owner shall seek to collect such information where possible in the course of its normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities):

B 6 a (1) (b) (i). All plumbing codes, permits, and records in the files of the building department(s) which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system;

B 6 a (1) (b) (ii). All inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and

B 6 a (1) (b) (iii). All existing water quality information, which includes the results of all prior analyses of the waterworks or individual structures connected to the waterworks, indicating locations that may be particularly susceptible to high lead or copper concentrations.

B 6 a (1) (c). The sampling sites selected for a community waterworks' sampling pool ("tier 1 sampling sites") shall consist of single family structures that:

B 6 a (1) (c) (i). Contain copper pipes with lead solder installed between January 1983 and April 1986 or contain lead pipes; and/or

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B 6 a (1) (c) (ii). Are served by a lead service line.

NOTE: When multiple-family residences comprise at least 20 percent of the structures served by a waterworks, the waterworks may include these types of structures in its sampling pool.

B 6 a (1) (d). The owner of any community waterworks with insufficient tier 1 sampling sites shall complete the sampling pool with "tier 2 sampling sites", consisting of buildings, including multiple-family residences that:

B 6 a (1) (d) (i). Contain copper pipes with lead solder installed between January 1983 and April 1986 or contain lead pipes; and/or

B 6 a (1) (d) (ii). Are served by a lead service line.

B 6 a (1) (e). The owner of any community waterworks with insufficient tier 1 and tier 2 sampling sites shall complete the sampling pool with "tier 3 sampling sites", consisting of single family structures that contain copper pipes with lead solder installed before 1983.

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B 6 a (1) (f). The sampling sites selected for a nontransient noncommunity waterworks ("tier 1 sampling sites") shall consist of buildings that:

B 6 a (1) (f) (i). Contain copper pipes with lead solder installed between January 1983 and April 1986 or contain lead pipes; and/or

B 6 a (1) (f) (ii). Are served by a lead service line.

B 6 a (1) (g). The owner of a nontransient noncommunity waterworks with insufficient tier 1 sites that meet the targeting criteria in subdivision B 6 a (1) (f) of this section shall complete the sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983.

B 6 a (1) (h). All waterworks owner shall notify the appropriate field office of the Division in writing when the pool of sampling sites has been identified and indicate that a sufficient number of tier 1 sites were included in the pool to comply with the required number of sampling sites specified under subsection B 6 a (3).

B 6 a (1) (h) (i). The owner of any waterworks whose sampling pool does not consist exclusively of tier 1 sites shall demonstrate in a letter submitted to the field office under 12 VAC 5-590-530 D 1 b, why a review of the information listed in subdivision B 6 a (1) (b) of this section was inadequate to locate a sufficient number of tier 1 sites.

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B 6 a (1) (h) (ii). The owner of any community waterworks which includes tier 3 sampling sites in its sampling pool shall demonstrate in such a letter why it was unable to locate a sufficient number of tier 1 and tier 2 sampling sites.

B 6 a (1) (i). The owner of any waterworks whose distribution system contains lead service lines shall draw 50 percent of the samples the owner collects during each monitoring period from sites that contain lead pipes, or copper pipes with lead solder, and 50 percent of the samples the owner collects from sites served by a lead service line. Any owner who cannot identify a sufficient number of sampling sites served by a lead service line shall demonstrate in a letter submitted to the field office under 12 VAC 5-590-530 D 1 d why the owner was unable to locate a sufficient number of such sites. The owner of such a waterworks shall collect first draw tap samples from all of the sites identified as being served by such lines.

B 6 a (2). Sample collection methods

B 6 a (2) (a). All tap samples for lead and copper, with the exception of lead service line samples collected under 12 VAC 5-590-420 E 3, shall be first draw samples.

B 6 a (2) (b). Each first-draw tap sample for lead and copper shall be one liter in volume and have stood motionless in the plumbing system of each sampling site for at least six hours. First draw samples from residential housing shall be collected from the cold-water kitchen tap or bathroom sink tap. First-draw samples from a non-residential building shall be collected at an

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interior tap from which water is typically drawn for consumption. First draw samples may be collected by the waterworks owner or the owner may allow residents to collect first draw samples after instructing the residents of the sampling procedures. To avoid problems of residents handling nitric acid, acidification of first draw samples may be done up to 14 days after the sample is collected. If the sample is not acidified immediately after collection, then the sample must stand in the original container for at least 28 hours after acidification. If an owner allows residents to perform sampling, the owner may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

B 6 a (2) (c). Each lead service line sample collected pursuant to 12 VAC 5-590-420 E 3 for the purpose of avoiding replacement shall be one liter in volume and have stood motionless in the lead service line for at least six hours. Lead service line samples shall be collected in one of the following three ways:

B 6 a (2) (c) (i). At the tap after flushing the volume of water between the tap and the lead service line. The volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;

B 6 a (2) (c) (ii). Tapping directly into the lead service line; or

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B 6 a (2) (c) (iii). If the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.

B 6 a (2) (d). A waterworks owner shall collect each first draw tap sample from the same sampling site from which the owner collected a previous sample. If, for any reason, the owner cannot gain entry to a sampling site in order to collect a follow-up tap sample, the owner may collect the follow-up tap sample from another sampling site in the sampling pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.

B 6 a (3). Number of samples - Waterworks owners shall collect at least one sample during each monitoring period specified in subdivision B 6 a (4) of this section from the number of sites listed in the first column below ("standard monitoring"). The owner of a waterworks conducting reduced monitoring under subdivision B 6 a (4) (d) of the section may collect one sample from the number of sites specified in the second column below during each monitoring period specified in subdivision B 6 a (4) (d) of this section.

System Size (# People Served)	# of sites (Standard Monitoring)	# of sites (Reduced Monitoring)
>100,000	100	50
10,001-100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
≤ 100	5	5

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B 6 a (4). Timing of monitoring

B 6 a (4) (a). Initial tap sampling. The first six-month monitoring period for small, medium-size and large waterworks shall begin on the following dates:

System Size (# People Served)	First six-month Monitoring Period Begins On
Large >50,000	January 1, 1992
Medium 3,301 to 50,000	July 1, 1992
Small ≤ 3,300	July 1, 1993

B 6 a (4) (a) (i). All large waterworks shall monitor during two consecutive six-month periods.

B 6 a (4) (a) (ii). All small and medium-size waterworks shall monitor during each six-month monitoring period until the waterworks exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under 12 VAC 5-590-420 C, in which case the owner shall continue monitoring in accordance with 12 VAC 5-590-370 B 6 a (4) (d), or the waterworks meets the lead and copper action levels during two consecutive six-month monitoring periods, in which case the owner may reduce monitoring in accordance with .

B 6 a (4) (b). Monitoring after installation of corrosion control and water supply (source water) treatment

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B 6 a (4) (b) (i). The owner of any large waterworks which installs optimal corrosion control treatment pursuant to 12 VAC 5-590-420 C shall monitor during two consecutive six-month monitoring periods by the date specified in 12 VAC 5-590-420 C 2 d (5).

B 6 a (4) (b) (ii). The owner of any small or medium-size waterworks which installs optimal corrosion control treatment pursuant to 12 VAC 5-590-420 C 2 e (5) shall monitor during two consecutive six-month monitoring periods by the date specified in 12 VAC 5-590-420 C 2 e (6).

B 6 a (4) (b) (iii). The owner of any waterworks which installs source water treatment pursuant to 12 VAC 5-590-420 D 1 c shall monitor during two consecutive six-month monitoring periods by the date specified in 12 VAC 5-590-420 D 1 d.

B 6 a (4) (c). Monitoring after the Commissioner specifies water quality parameter values for optimal corrosion control - After the Commissioner specifies the values for water quality control parameters under 12 VAC 5-590-420 C 1 f, the waterworks owner shall monitor during each subsequent six-month monitoring period, with the first monitoring period to begin on the date the Commissioner specifies the optimal values under 12 VAC 5-590-420 C 1 f.

B 6 a (4) (d). Reduced monitoring

B 6 a (4) (d) (i). The owner of a small or medium-size waterworks that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the

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number of samples in accordance with subdivision B 6 a, and reduce the frequency of sampling to once per year.

B 6 a (4) (d) (ii). The owner of any waterworks that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Commissioner under subdivision 12 VAC 5-590-420 C 1 f during each of two consecutive six-month monitoring periods may request that the Commissioner allow the waterworks to reduce the frequency of monitoring to once per year and to reduce the number of lead and copper samples in accordance with subdivision B 6 a (3). The Commissioner shall review the information submitted by the waterworks and shall make a decision in writing, setting forth the basis for its determination. The Commissioner shall review, and where appropriate, revise its determination when the owner submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

B 6 a (4) (d) (iii). The owner of a small or medium-size waterworks that meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. Any waterworks that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Commissioner under 12 VAC 5-590-420 C 1 f during three consecutive years of monitoring may request that the Commissioner allow the waterworks to reduce the frequency of monitoring from annually to once every three years. The Commissioner shall review the information submitted by the owner and shall make a decision in writing, setting

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forth the basis for its determination. The Commissioner shall review, and where appropriate, revise its determination when the owner submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

B 6 a (4) (d) (iv). The owner of a waterworks that reduces the number and frequency of sampling shall collect these samples from sites included in the pool of targeted sampling sites identified in subdivision B 6 a (1) of this section. Waterworks sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August or September.

B 6 a (4) (d) (v). The owner of a small or medium-size waterworks subject to reduced monitoring that exceeds the lead or copper action level shall resume sampling in accordance with subdivision B 6 a (4) (c) of this section and collect the number of samples specified for standard monitoring under subdivision B 6 a (3) of this section. Such waterworks owner shall also conduct water quality parameter monitoring in accordance with subdivision B 6 b (2), B 6 b (3), or B 6 b (4) of this section (as appropriate) during the monitoring period in which the action level is exceeded. Any waterworks subject to reduced monitoring frequency that fails to operate within the range of values for the water quality control parameters specified by the Commissioner under subdivision 12 VAC 5-590-420 C 1 f shall resume tap water sampling in accordance with subdivision B 6 a (4) (c) of this section and collect the number of samples specified for standard monitoring under subdivision B 6 a (3) of this section.

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B 6 a (5). Additional monitoring by waterworks owner - The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the waterworks owner and the Commissioner in making any determinations (i.e., calculating the 90th percentile lead or copper level) under this subpart.

B 6 b. Monitoring requirements for water quality parameters. The owners of all large waterworks, and all small and medium-size waterworks that exceed the lead or copper action level shall monitor water quality parameters in addition to lead and copper in accordance with this section. The requirements of this section are in summarized Appendix M.

B 6 b (1). General Requirements

B 6 b (1) (a). Sample collection methods

B 6 b (1) (a) (i). Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the waterworks, and seasonal variability. Tap sampling under this section is not required to be conducted at taps targeted for lead and copper sampling under subdivision B 6 a (1) of this section. Waterworks owners may find it convenient to conduct tap sampling for water quality parameters at sites approved for coliform sampling.

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B 6 b (1) (a) (ii). Samples collected at the entry point(s) to the distribution system shall be from locations representative of each source after treatment. If a waterworks draws water from more than one source and the sources are combined before distribution, the waterworks owner must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

B 6 b (1) (b). Number of samples

B 6 b (1) (b) (i). Waterworks owners shall collect two tap samples for applicable water quality parameters during each monitoring period specified under subdivision B 6 b (2) through B 6 b (5) of this section from the following number of sites.

System Size (# People Served)	# of Sites For Water Quality Parameters
>100,000	25
10,001-100,000	10
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
≤ 100	1

B 6 b (1) (b) (ii). Waterworks owners shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each monitoring period specified in subdivision B 6 b (2) of this section. During each monitoring period specified in

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subdivision B 6 b (3) through B 6 b (5), waterworks owners shall collect one sample for each applicable water quality parameter at each entry point to the distribution system .

B 6 b (2). Initial Sampling - The owners of all large waterworks shall measure the applicable water quality parameters as specified below at taps and at each entry point to the distribution system during each six-month monitoring period specified in subdivision B 6 a (4) (a) of this section. The owners of all small and medium-size waterworks shall measure the applicable water quality parameters at the locations specified below during each six-month monitoring period specified in subdivision B 6 a (4) (a) of this section during which the waterworks exceeds the lead or copper action level.

B 6 b (2) (a). At taps:

B 6 b (2) (a) (i). pH;

B 6 b (2) (a) (ii). alkalinity;

B 6 b (2) (a) (iii). orthophosphate, when an inhibitor containing a phosphate compound is used;

B 6 b (2) (a) (iv). silica, when an inhibitor containing a silicate compound is used;

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B 6 b (2) (a) (v). calcium;

B 6 b (2) (a) (vi). conductivity; and

B 6 b (2) (a) (vii). water temperature.

B 6 b (2) (b). At each entry point to the distribution system: all of the applicable parameters listed in subdivision B 6 b (2) (a) of this section.

B 6 b (3). Monitoring after installation of corrosion control - The owner of any large waterworks which installs optimal corrosion control treatment pursuant to 12 VAC 5-590-420 C 2 d (4) shall measure the water quality parameters at the locations and frequencies specified below during each six-month monitoring period specified in subdivision B 6 a (4) (b) (i) of this section. The owner of any small or medium-size waterworks which installs optimal corrosion control treatment shall conduct such monitoring during each six-month monitoring period specified in subdivision B 6 a (4) (b) (ii) of this section in which the waterworks exceeds the lead or copper action level.

B 6 b (3) (a). At taps, two samples for:

B 6 b (3) (a) (i). pH;

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B 6 b (3) (a) (ii). alkalinity;

B 6 b (3) (a) (iii). orthophosphate, when an inhibitor containing a phosphate compound is used;

B 6 b (3) (a) (iv). silica, when an inhibitor containing a silicate compound is used;

B 6 b (3) (a) (v). calcium, when calcium carbonate stabilization is used as part of corrosion control.

B 6 b (3) (b). At each entry point to the distribution system, one sample every two weeks (bi-weekly) for:

B 6 b (3) (b) (i). pH;

B 6 b (3) (b) (ii). when alkalinity is adjusted as part of optimal corrosion control, a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and

B 6 b (3) (b) (iii). when a corrosion inhibitor is used as part of optimal corrosion control, a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate or silica (whichever is applicable).

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B 6 b (4). Monitoring after the Commissioner specifies water quality parameter values for optimal corrosion control - After the Commissioner specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under 12 VAC 5-590-420 C 1 f, the owners of all large waterworks shall measure the applicable water quality parameters in accordance with subdivision B 6 b(3) of this section during each monitoring period specified in subdivision B 6 a (4) (c) of this section. The owner of any small or medium-size waterworks shall conduct such monitoring during each monitoring period specified in subdivision B 6 a (4) (c) of this section in which the waterworks exceeds the lead or copper action level. The owner may take a confirmation sample for any water quality parameter value no later than 3 days after the first sample. If a confirmation sample is taken, the result must be averaged with the first sampling result and the average must be used for any compliance determinations under 12 VAC 5-590-420 C 1 g. The Commissioner has discretion to delete results of obvious sampling errors from this calculation.

B 6 b (5). Reduced monitoring

B 6 b (5) (a). The owner of any waterworks that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six-month monitoring periods under subdivision B 6 b (4) of this section shall continue monitoring at the entry point(s) to the distribution system as specified in subdivision B 6 b (3) (b) of this section. The owner of such waterworks may collect two tap samples for applicable water quality parameters from the following reduced number of sites during each six-month monitoring period.

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Reduced # of Sites (# People Served)	System Size for Water Quality Parameters
>100,000	10
10,001-100,000	7
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
≤ 100	1

B 6 b (5) (b). The owner of any waterworks that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Commissioner under subdivision 12 VAC 5-590-420 C 1 f during three consecutive years of monitoring may reduce the frequency with which the owner collects the number of tap samples for applicable water quality parameters specified in this subdivision B 6 b (5) (a) of this section from every six months to annually.

B 6 b (5) (c). The owner of a waterworks that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.

B 6 b (5) (d). The owner of any waterworks subject to reduced monitoring frequency that fails to operate within the range of values for the water quality parameters specified by the Commissioner under 12 VAC 5-590-420 C 1 f shall resume tap water sampling in accordance with the number and frequency requirements in subdivision B 6 b (4) of this section.

B 6 b (6). Additional monitoring by waterworks owners - The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered

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by the waterworks owner and the Commissioner in making any determinations under this section or 12 VAC 5-590-420 C 1.

B 6 c. Monitoring requirements for lead and copper in water supplies (source water)

B 6 c (1). Sample location, collection methods, and number of samples

B 6 c (1) (a). The owner of a waterworks that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with subdivision B 6 of this section shall collect lead and copper water supply samples in accordance with the requirements regarding sample location, number of samples, and collection methods specified in subsection B 1 (inorganic chemical sampling). The timing of sampling for lead and copper in water supplies shall be in accordance with subdivision B 6 c (2) and B 6 c (3) of this section.

B 6 c (1) (b). Where the results of sampling indicate an exceedance of maximum permissible water supply levels established under 12 VAC 5-590-420 D 4, the Commissioner may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point. If the Commissioner required confirmation sample is taken for lead or copper, then the results of the initial and confirmation sample shall be averaged in determining compliance with the Commissioner-specified maximum permissible levels. Any sample value below the detection limit shall be considered to be zero. Any value above the detection limit but below the PQL shall either be considered as the measured value or be

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considered one-half the PQL. The PQL for Lead is equal to 0.005 mg/l and the PQL for Copper is equal to 0.050 mg/l.

B 6 c (2). Monitoring frequency after waterworks exceeds tap action level - The owner of any waterworks which exceeds the lead or copper action level at the tap shall collect one water supply sample from each entry point to the distribution system within six months after the exceedance.

B 6 c (3). Monitoring frequency after installation of water supply treatment - The owner of any waterworks which installs water supply treatment pursuant to 12 VAC 5-590-420 D 1 b shall collect an additional water supply sample from each entry point to the distribution system during two consecutive six-month monitoring periods by the deadline specified in 12 VAC 5-590-420 D 1 d.

B 6 c (4). Monitoring frequency after the Commissioner specifies maximum permissible water supply lead and copper levels or determines that water supply treatment is not needed

B 6 c (4) (a). A waterworks owner shall monitor at the frequency specified below in cases where the Commissioner specifies maximum permissible water supply lead and copper levels under 12 VAC 5-590-420 D 4 or determines that the owner is not required to install water supply treatment under 12 VAC 5-590-420 D 2 b.

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B 6 c (4) (a) (i). The owner of a waterworks using only groundwater shall collect samples once during the three-year compliance period in effect when the applicable Commissioner determination under subdivision B 6 b (4) of this section is made. Owners of such waterworks shall collect samples once during each subsequent compliance period.

B 6 c (4) (a) (ii). The owner of a waterworks using surface water (or a combination of surface and groundwater) shall collect samples once during each year, the first annual monitoring period to begin on the date on which the applicable Commissioner determination is made under subdivision B 6 c (4) (a) of this section.

B 6 c (4) (b). A waterworks owner is not required to conduct water supply sampling for lead and/or copper if the waterworks meets the action level for the specific contaminant in tap water samples during the entire water supply sampling period applicable to the waterworks under subdivision B 6 c (4) (a) (i) or B 6 c (4) (a) (ii) of this section.

B 6 c (5). Reduced monitoring frequency

B 6 c (5) (a). The owner of a waterworks using only groundwater which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and/or copper concentrations specified by the Commissioner in 12 VAC 5-590-420 D 4 during at least three consecutive compliance periods under subdivision B 6 c (4) of this

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section may reduce the monitoring frequency for lead and/or copper to once during each nine-year compliance cycle.

B 6 c (5) (b). The owner of a waterworks using surface water (or a combination of surface and ground waters) which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the Commissioner in 12 VAC 5-590-420 D 4 for at least three consecutive years may reduce the monitoring frequency in 12 VAC 5-590-370 B 6 c (4) (a) to once during each nine-year compliance cycle.

B 6 c (5) (c). A waterworks that uses a new water supply is not eligible for reduced monitoring for lead and/or copper until concentrations in samples collected from the new supply during three consecutive monitoring periods are below the maximum permissible lead and copper concentrations specified by the Commissioner in 12 VAC 5-590-420 D 1 e.

B 7. The owner of a waterworks that uses a surface water source or a groundwater source under the direct influence of surface water and provides filtration treatment must monitor in accordance with this section beginning June 29, 1993, or when filtration is installed, whichever is later.

B 7 a. Turbidity measurements as required by 12 VAC 5-590-410 6 shall be performed on representative samples of the filtered water every four hours (or more frequently) that the

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waterworks serves water to the public. A waterworks owner may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the Commissioner. For any waterworks using slow sand filtration or filtration treatment other than conventional treatment, direct filtration, or diatomaceous earth filtration, the Commissioner may reduce the sampling frequency to once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance. For waterworks serving 500 or fewer persons, the Commissioner may reduce the turbidity sampling frequency to once per day, regardless of the type of filtration treatment used, if the Commissioner determines that less frequent monitoring is sufficient to indicate effective filtration performance.

B 7 b. The residual disinfectant concentration of the water entering the distribution system shall be monitored continuously, and the lowest value shall be recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment, and owners of waterworks serving 3,300 or fewer persons may take grab samples in lieu of continuous monitoring on an ongoing basis at the frequencies each day prescribed below:

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Waterworks size by population Samples/Day*(1)

500 or less	1
501 to 1,000	2
1,000 to 2,500	3
2,501 to 3,300	4

*(1) The day's samples cannot be taken at the same time. The sampling intervals are subject to Commissioner's review and approval.

If at any time the residual disinfectant concentration falls below 0.2 mg/L in a waterworks using grab sampling in lieu of continuous monitoring, the waterworks owner shall take a grab sample every four hours until the residual disinfectant concentration is equal to or greater than 0.2 mg/L.

B 7 b (1). The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in 12 VAC 5-590-370 A, except that the Commissioner may allow a waterworks owner which uses both a surface water source or a groundwater source under direct influence of surface water, and a groundwater source to take disinfectant residual samples at points other than the total coliform sampling points if the Commissioner determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in 12 VAC 5-590-420 B may be measured in lieu of residual disinfectant concentration.

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B 7 b (2). If the Commissioner determines, based on site-specific considerations, that a waterworks has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions and that the waterworks is providing adequate disinfection in the distribution system, the requirements of subdivision B 7 b (1) of this section do not apply to that waterworks.

B 7 c. The following information on the samples taken in the distribution system in conjunction with total coliform monitoring pursuant to 12 VAC 5-590-420 B shall be reported monthly to the Commissioner by the waterworks owner:

B 7 c (1). Number of instances where the residual disinfectant concentration is measured;

B 7 c (2). Number of instances where the residual disinfectant concentration is not measured but HPC is measured;

B 7 c (3). Number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;

B 7 c (4). Number of instances where no residual disinfectant concentration is detected and where the HPC is greater than 500/mL;

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B 7 c (5). Number of instances where the residual disinfectant concentration is not measured and HPC is greater than 500/mL.

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B 7 c (6). For the current and previous month the waterworks serves water to the public, the value of "V" in percent in the following formula:

$$V = \left[\frac{(c + d + e)}{(a + b)} \right] * 100$$

where

a = the value in subdivision B 7 c (1) of this section,

b = the value in subdivision B 7 c (2) of this section,

c = the value in subdivision B 7 c (3) of this section,

d = the value in subdivision B 7 c (4) of this section,

e = the value in subdivision B 7 c (5) of this section,

B 7 c (7). If the Commissioner determines, based on site-specific considerations, that a waterworks owner has no means for having a sample transported and analyzed for HPC by a certified laboratory within the requisite time and temperature conditions and that the waterworks is providing adequate disinfection in the distribution system, the requirements of subdivision B 7 c (1) of this section do not apply.

B 7 d. A waterworks owner need not report the data listed in 12 VAC 5-590-530 C 2 a if all data listed in 12 VAC 5-590-530 C 2 a through 12 VAC 5-590-530 C 2 c remain on file at the waterworks and the Commissioner determines that the waterworks owner has submitted all the

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information required by 12 VAC 5-590-530 C 2 a through 12 VAC 5-590-530 C 2 c for at least 12 months.

B 8. Waterworks owners may be required by the Commissioner to collect additional samples to provide quality control for any treatment processes that are employed.

C. Physical. All samples for turbidity analysis shall be taken at a representative entry point or points to the water distribution system unless otherwise specified. Turbidity samples shall be analyzed, at least once per day at all waterworks that use surface water sources or groundwater sources under the direct influence of surface water.

D. Radiological. The frequency of radiological sampling shall be accordance with 12 VAC 5-590-400.

I certify that this regulation is full, true, and correctly dated.

E. Anne Peterson, M.D., M.P.H.
State Health Commissioner
Virginia Department of Health

Date: _____

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12 VAC 5-590-545. Consumer Confidence ReportsA. Purpose and applicability.

1. Each community waterworks owner shall deliver to his customers an annual report that contains information on the quality of the water delivered by the waterworks and characterizes the risks, if any, from exposure to contaminants detected in the drinking water.

2. For the purpose of this section, customers are defined as billing units or service connections to which water is delivered by a community waterworks.

3. For the purpose of this section, a contaminant is detected when the laboratory reports the contaminant level as a measured level and not as non-detected (ND) or less than (<) a certain level. The laboratory's analytical and reporting procedures shall have been in accordance with 12 VAC 5-590-440; laboratory certification requirements of the Commonwealth of Virginia, Department of General Services, Division of Consolidated Laboratory Services; and consistent with current U. S. Environmental Protection Agency regulations found at 40 CFR Part 141.

B. Effective dates.

1. Each existing community waterworks owner shall deliver his report by July 1 annually.

2. The owner of a new community waterworks shall deliver his first report by July 1 of

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the year after its first full calendar year in operation and annually thereafter.

3. The owner of a community waterworks that sells water to a consecutive waterworks shall deliver the applicable information necessary to comply with the requirements contained in this section to the consecutive waterworks.

a. by April 1 annually, or

b. on a date mutually agreed upon by the seller and the purchaser and specifically included in a contract between the parties.

C. Content.

1. Each community waterworks owner shall provide his customers an annual report that contains the information specified in this section.

2. Information on the source of the water delivered:

a. Each report shall identify the source(s) of the water delivered by the community waterworks by providing information on:

1. The type of the water: e.g., surface water, ground water; and

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2. The commonly used name (if any) and location of the body (or bodies) of water.

b. Where a source water assessment has been completed, the report shall

1. notify consumers of the availability of the assessment,

2. describe the means to obtain the assessment, and

3. include a brief summary of the waterworks' susceptibility to potential sources of contamination.

c. The waterworks owner should highlight in the report significant sources of contamination in the source water area if such information is readily available.

3. For the purpose of compliance with this section, each report shall include the following definitions:

a. Maximum Contaminant Level Goal or MCLG: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

b. Maximum Contaminant Level or MCL: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best

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available treatment technology.

c. A report for a community water system operating under a variance or an exemption issued by the Commissioner under 12 VAC 5-590-140 and 12 VAC 5-590-150 shall include the following definition: Variances and Exemptions: State or EPA permission not to meet an MCL or a treatment technique under certain conditions.

d. A report that contains data on contaminants that EPA regulates using any of the following terms shall include the applicable definitions:

1. Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

2. Action Level: The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

3. Maximum residual disinfectant level goal or MRDLG: The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

4. Maximum residual disinfectant level or MRDL: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

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C4. Information on detected contaminants.

a. This section specifies the requirements for information to be included in each report for the following contaminants:

1. Contaminants subject to a PMCL, action level, maximum residual disinfectant level, or treatment technique as specified in 12 VAC 5-590-370;

2. Unregulated contaminants subject to monitoring as specified in 12 VAC 5-590-370; and

3. Disinfection by-products or microbial contaminants, except Cryptosporidium, for which monitoring is required by Information Collection Rule [40 CFR Chapter 1, Sections 141.142 and 141.143 (7-1-97 Edition)], except as provided under paragraph C5a of this section, and which are detected in the finished water.

b. The data relating to these contaminants shall be displayed in one table or in several adjacent tables. Any additional monitoring results that a community waterworks owner chooses to include in the report shall be displayed separately.

c. The data shall be derived from data collected to comply with EPA and State monitoring and analytical requirements during the calendar year preceding the year the report is

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due, except that:

1. Where a waterworks owner is allowed to monitor for contaminants specified in paragraph D1a. of this section less often than once a year, the table(s) shall include the date and results of the most recent sampling, and the report shall include a brief statement indicating that the data presented in the report are from the most recent testing done in accordance with the regulations. No data older than 5 years need be included.

2. Results of monitoring in compliance with the Information Collection Rule [40 CFR Chapter 1, Sections 141.142 and 141.143 (7-1-97 Edition)] need only be included for 5 years from the date of last sample or until any of the detected contaminants becomes regulated and subject to routine monitoring requirements, whichever comes first.

d. For detected contaminants subject to a PMCL, action level, or treatment technique as specified in 12 VAC 5-590-370 and listed in Tables 2.1, 2.2 (Primary Maximum Contaminant Levels only), 2.3, 2.4 (Primary Maximum Contaminant Levels only), and 2.5, the table(s) must contain:

1. The PMCL for that contaminant expressed as a number equal to or greater than 1.0 as provided in Appendix O, with an exception for beta/photon emitters. When the detected level of beta/photon emitters has been reported in the units of pCi/L and does not exceed 50 pCi/L, the report may list the PMCL as 50 pCi/L. In this case, the waterworks owner shall include in the report the following footnote: The PMCL for beta particles is 4 mrem/year. EPA considers 50

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pCi/L to be the level of concern for beta particles.

2. The MCLG for that contaminant expressed in the same units as the PMCL as provided in Appendix O;

3. If there is no PMCL for a detected contaminant, the table must indicate that there is a treatment technique, or specify the action level, applicable to that contaminant, and the report shall include the definitions for treatment technique and/or action level, as appropriate, specified in paragraph C3d of this section;

4. For contaminants subject to a PMCL, except turbidity and total coliforms: The highest contaminant level used to determine compliance and the range of detected levels, as follows:

a. When compliance with the PMCL is determined annually or less frequently: The highest detected level at any sampling point and the range of detected levels expressed in the same units as the PMCL.

b. When compliance with the PMCL is determined by calculating a running annual average of all samples taken at a sampling point: The highest average of any of the sampling points and the range of all sampling points expressed in the same units as the PMCL.

c. When compliance with the PMCL is determined on a system-wide basis by calculating a running annual average of all samples at all sampling points: The average and range of

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detection expressed in the same units as the PMCL.

5. For turbidity: The highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in 12 VAC 5-590-420 for the filtration technology being used. The report should include an explanation of the reasons for measuring turbidity;

6. For lead and copper: The 90th percentile value of the most recent round of sampling and the number of sampling sites exceeding the action level;

7. For total coliform:

a. The highest monthly number of positive samples for waterworks collecting fewer than 40 samples per month;

b. The highest monthly percentage of positive samples for systems collecting at least 40 samples per month;

8. For fecal coliform: The total number of positive samples;

9. The likely source(s) of detected contaminants. Specific information regarding contaminants may be available in sanitary surveys and source water assessments, and should be used when available to the waterworks owner. If the waterworks owner lacks specific

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information on the likely source, the report shall include one or more of the typical sources for that contaminant listed in Appendix O which are most applicable to the system.

e. If a community waterworks owner distributes water to his customers from multiple hydraulically independent distribution systems that are fed by different raw water sources:

1. The table shall contain a separate column for each service area and the report shall identify each separate distribution system; or

2. Waterworks owner shall produce a separate report tailored to include data for each service area.

f. The table(s) shall clearly identify any data indicating violations of PMCLs, MRDLs, or treatment techniques and the report shall contain a clear and readily understandable explanation of the violation including:

1. The length of the violation;

2. The potential adverse health effects using the relevant language of Appendix O; and

3. Actions taken by the waterworks owner to address the violation.

g. For detected unregulated contaminants subject to monitoring as specified in 12 VAC 5-

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590-370 and listed in Tables 2.6 and 2.7, for which monitoring is required, the table(s) shall contain the average and range at which the contaminant was detected. The report may include a brief explanation of the reasons for monitoring for unregulated contaminants.

5. Information on Cryptosporidium, radon, and other contaminants:

a. If the waterworks has performed any monitoring for Cryptosporidium, including monitoring performed to satisfy the requirements of the Informational Collection Rule [40 CFR Chapter 1, Section 141.143 (7-1-97 Edition)], which indicates that Cryptosporidium may be present in the source water or the finished water, the report shall include:

1. A summary of the results of the monitoring; and

2. An explanation of the significance of the results.

b. If the waterworks has performed any monitoring for radon which indicates that radon may be present in the finished water, the report shall include:

1. The results of the monitoring; and

2. An explanation of the significance of the results.

c. If the waterworks owner has performed additional monitoring which indicates the

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presence of other contaminants in the finished water, the report should include any results, which may indicate a health concern, as determined by the Commissioner. Detects above a proposed MCL or health advisory level may indicate possible health concerns. For such contaminants, the report should include:

1. The results of the monitoring; and

2. An explanation of the significance of the results noting the existence of a health advisory or a proposed regulation.

6. Compliance with other regulations.

a. In addition to the requirements of paragraph C4f of this section the report shall note any violation that occurred during the year covered by the report of a requirement listed below.

1. Monitoring and reporting of compliance data;

2. Filtration and disinfection prescribed by 12 VAC 5-590-420. For waterworks owners who have failed to install adequate filtration or disinfection equipment or processes, or have had a failure of such equipment or processes which constitutes a violation, the report shall include the following language as part of the explanation of potential adverse health effects: Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated

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headaches.

3. Lead and copper control requirements prescribed by 12 VAC 5-590-370. For waterworks owners who fail to take one or more of the prescribed actions, the report shall include the applicable language of Appendix O for lead, copper, or both.

4. Treatment techniques for Acrylamide and Epichlorohydrin prescribed by 12 VAC 5-590-420 G. For waterworks owners who violate the requirements of that section, the report shall include the relevant language from Appendix O.

5. Recordkeeping of compliance data.

6. Special monitoring requirements for unregulated contaminants prescribed by 12 VAC 5-590-370 B4 and for sodium.

7. Violation of the terms of a variance, an exemption, or an administrative or judicial order.

b. The report shall contain:

1. a clear and readily understandable explanation of the violation;

2. any potential adverse health effects; and

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3. the steps the waterworks owner has taken to correct the violation.

7. Variances and Exemptions. If a system is operating under the terms of a variance or an exemption issued by the Commissioner under 12 VAC 5-590-140 and 12 VAC 5-590-150, the report shall contain:

a. An explanation of the reasons for the variance or exemption;

b. The date on which the variance or exemption was issued;

c. A brief status report on the steps the waterworks owner is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and

d. A notice of any opportunity for public input in the review, or renewal, of the variance or exemption.

8. Additional information:

a. The report shall contain a brief explanation regarding contaminants, which may reasonably be expected to be found in drinking water including bottled water. This explanation shall include the exact language of paragraphs C8a(1) through C8a(3) of this section or the

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waterworks owner shall use his own comparable language following approval by the

Commissioner. The report also shall include the exact language of paragraph C8a(4) of this section.

1. The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

2. Contaminants that may be present in source water include: (A) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. (B) Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming. (C) Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses. (D) Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems. (E) Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

3. In order to ensure that tap water is safe to drink, EPA prescribes regulations that limit

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the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

4. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

b. The report shall include the telephone number of the waterworks owner, operator, or designee of the community waterworks as a source of additional information concerning the report.

c. In communities with a large proportion of non-English speaking residents, as determined by the Commissioner, the report shall contain information in the appropriate language(s) regarding the importance of the report or contain a telephone number or address where such residents may contact the system to obtain a translated copy of the report or assistance in the appropriate language.

d. The report shall include the following information about opportunities for public participation in decisions that may affect the quality of the water. The waterworks owner should consider including additional relevant information.

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1. The time and place of regularly scheduled board meetings of the governing body which has authority over the waterworks.

2. If regularly scheduled board meetings are not held, the name and telephone number of a waterworks representative who has operational or managerial authority over the waterworks.

- e. The waterworks owner may include such additional information as he deems necessary for public education consistent with, and not detracting from, the purpose of the report.

D. Additional health information.

1. All reports shall prominently display the following language: Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

2. A waterworks owner who detects arsenic at levels above 25 ug/l, but below the PMCL:

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a. Shall include in its report the following informational statement about arsenic: EPA is reviewing the drinking water standard for arsenic because of special concerns that it may not be stringent enough. Arsenic is a naturally occurring mineral known to cause cancer in humans at high concentrations.

b. In lieu of the statement required in D2a of this section the waterworks owner may include his own educational statement, after receiving approval from the Commissioner.

3. A waterworks owner who detects nitrate at levels above 5 mg/l, but below the PMCL:

a. Shall include in its report the following informational statement about the impacts of nitrate on children: Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider.

b. In lieu of the statement required in D3a of this section the waterworks owner may include his own educational statement, after receiving approval from the Commissioner.

4. A waterworks owner who detects lead above the action level in more than 5%, and up to and including 10%, of homes sampled:

a. Shall include the following informational statement about the special impact of lead on

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children: Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).

b. In lieu of the statement required in D4a of this section the waterworks owner may include his own educational statement, after receiving approval from the Commissioner.

5. Community waterworks owners that detect TTHM above 0.080 mg/l, but below the PMCL, as an annual average shall include health effects language prescribed by paragraph 73 of Appendix O.

E. Report delivery and recordkeeping.

1. Each community waterworks owner shall mail or otherwise directly deliver one copy of the report to each customer.

2. The waterworks owner shall make a good faith effort that shall be tailored to the consumers who are served by the system but are not bill-paying customers, such as renters and workers. This good faith effort shall include at least one and preferably two or more of the following methods appropriate to the particular waterworks.

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- a. Posting the reports on the Internet;
 - b. Mailing to postal patrons in metropolitan areas;
 - c. Advertising the availability of the report in the news media;
 - d. Publication in a local newspaper;
 - e. Posting in public places such as libraries, community centers, and public buildings;
 - f. Delivery of multiple copies for distribution by single-biller customers such as apartment buildings or large private employers;
 - g. Delivery to community organizations.
 - h. Other methods as approved by the Commissioner.
3. No later than July 1 of each year the waterworks owner shall deliver a copy of the report to the appropriate Virginia Department of Health, Environmental Engineering Field Office, followed within 3 months by a certification that the report has been distributed to customers and that the information in the report is correct and consistent with the compliance monitoring data previously submitted to the Commissioner.

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4. No later than July 1 of each year the waterworks owner shall deliver the report to any other agency or clearinghouse specified by the Commissioner.

5. Each community waterworks owner shall make the report available to the public upon request.

6. The owner of each community waterworks serving 100,000 or more persons shall post the current year's report to a publicly accessible site on the Internet.

7. Each community waterworks owner shall retain copies of the report for no less than 3 years.

I certify that this regulation is full, true, and correctly dated.

E. Anne Peterson, M.D., M.P.H.
State Health Commissioner
Virginia Department of Health

Date: _____

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APPENDIX O – REGULATED CONTAMINANTS FOR CONSUMER CONFIDENCE REPORTS

Key

AL=Action Level

NTU=Nephelometric Turbidity Units

ppb=parts per billion, or micrograms per liter (µg/l)

MCL=Maximum Contaminant Level

pCi/l=picocuries per liter (a measure of radioactivity)

ppt=parts per trillion, or nanograms per liter

MCLG=Maximum Contaminant Level Goal

ppm=parts per million, or milligrams per liter (mg/l)

ppq=parts per quadrillion, or picograms per liter

MFL=million fibers per liter

TT=Treatment Technique

mrem/year=millirems per year (a measure of radiation absorbed by the body)

Microbiological Contaminants						
Contaminant (units)	traditional MCL in mg/l	to convert for CCR, multiply by	MCL in CCR units	MCLG	Major Sources in Drinking Water	
(1) Total Coliform Bacteria	MCL: (systems that collect 40 or more samples per month) 5% of monthly samples are positive; (systems that collect fewer than 40 samples per month) 1 positive monthly sample			0	Naturally present in the environment	Coliforms are bacteria used as an indicator of water quality. Coliforms were used as a warning of
(2) Fecal coliform and <i>E. coli</i>	MCL: a routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or <i>E. coli</i> positive			0	Human and animal fecal waste	Fecal coliforms are a type of bacteria that can cause illness. Microbes in these cramps, nausea, and special health risk severely-compromised
(3) Turbidity	TT	=	TT	n/a	Soil runoff	Turbidity has no disinfection and may indicate the presence of organisms including symptoms such as
Radioactive Contaminants						
(4) Beta/photon emitters (mrem/yr)	4 mrem/yr	=	4	0	Decay of natural and man-made deposits	Certain minerals known as photon containing beta at years may have a
(5) Alpha emitters (pCi/l)	15 pCi/l	=	15	0	Erosion of natural deposits	Certain minerals known as alpha radiating alpha emitters in increased risk of
(6) Combined radium (pCi/l)	5 pCi/L	=	5	0	Erosion of natural deposits	Some people who of the MCL over cancer.
Inorganic Contaminants						
Contaminant (units)	traditional MCL in mg/l	to convert for CCR, multiply by	MCL in CCR units	MCLG	Major Sources in Drinking Water	
(7) Antimony (ppb)	.006	1000	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	Some people who the MCL over mg cholesterol and de

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(8) Arsenic (ppb)	.05	1000	50	n/a	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes	Some people who over many years of exposure to arsenic can develop circulatory system disease
(9) Asbestos (MFL)	7 MFL	-	7	7	Decay of asbestos cement water mains; Erosion of natural deposits	Some people who exceed the MCL over many years could develop benign intestinal disease
(10) Barium (ppm)	2	-	2	2	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	Some people who exceed the MCL over many years could develop kidney disease
(11) Beryllium (ppb)	.004	1000	4	4	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries	Some people who exceed the MCL over many years could develop lung disease
(12) Cadmium (ppb)	.005	1000	5	5	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints	Some people who exceed the MCL over many years could develop kidney disease
(13) Chromium (ppb)	.1	1000	100	100	Discharge from steel and pulp mills; Erosion of natural deposits	Some people who exceed the MCL over many years could develop lung disease
(14) Copper (ppm)	AL=1.3	-	AL=1.3	1.3	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives	Copper is an essential nutrient. However, excessive amounts of copper in the water can cause stomach pain, nausea, and vomiting. Long-term exposure to high levels of copper in the water can lead to liver disease. People who drink water with high levels of copper for many years could develop liver disease. Disease should be avoided.
(15) Cyanide (ppb)	.2	1000	200	200	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories	Some people who exceed the MCL over many years could develop thyroid disease with their thyroid gland
Contaminant (units)	traditional MCL in mg/l	to convert for CCR, multiply by	MCL in CCR units	MCLG	Major Sources in Drinking Water	
(16) Fluoride (ppm)	4	-	4	4	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories	Some people who exceed the MCL over many years could develop bone disease of the bones. Fluoride can cause mottling of teeth in children under 6 years old. Mottling is staining and/or pitting of the teeth before they erupt
(17) Lead (ppb)	AL=.015	1000	AL=15	0	Corrosion of household plumbing systems; Erosion of natural deposits	Infants and children under 6 years of age are most vulnerable to lead. Action level could lead to developmental delays, learning disabilities, and kidney problems
(18) Mercury [inorganic] (ppb)	.002	1000	2	2	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland	Some people who exceed the MCL over many years could develop kidney disease
(19) Nitrate (ppm)	10	-	10	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits	Infants below the age of 6 months are most vulnerable to nitrate. In excess of the MCL, nitrate can cause methemoglobinemia, a condition that reduces the ability of the blood to carry oxygen. Symptoms include cyanosis (bluish tint to the skin), lethargy, and difficulty breathing

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(20) Nitrite (ppm)	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits</u>	<u>Infants below the MCL are at risk of methemoglobinemia, which can be fatal. Symptoms include cyanosis, fatigue, and shortness of breath.</u>
(21) Selenium (ppb)	<u>.05</u>	<u>1000</u>	<u>50</u>	<u>50</u>	<u>Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines</u>	<u>Selenium is an essential nutrient, but excessive intake can cause hair loss, brittle nails, and neurological problems with the nervous system.</u>
(22) Thallium (ppb)	<u>.002</u>	<u>1000</u>	<u>2</u>	<u>0.5</u>	<u>Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories</u>	<u>Some people who consume MCL over many years may experience neurological problems, such as numbness, weakness, and blood, or problems with the nervous system.</u>

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Synthetic Organic Contaminants including Pesticides and Herbicides						
Contaminant (units)	traditional MCL in mg/l	to convert for CCR, multiply by	MCL in CCR units	MCLG	Major Sources in Drinking Water	
(23) 2,4-D (ppb)	.07	1000	70	70	Runoff from herbicides used on row crops	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live
(24) 2,4,5-TP [Silvex] (ppb)	.05	1000	50	50	Residue of banned herbicide	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live
(25) Acrylamide	TT	-	TT	0	Added to water during sewage/wastewater treatment	Some people who in excess of the MCL over a long period of time, live with kidney damage to their kidneys, live
(26) Alachlor (ppb)	.002	1000	2	0	Runoff from herbicide used on row crops	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live
(27) Atrazine (ppb)	.003	1000	3	3	Runoff from herbicide used on row crops	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live
(28) Benzo(a)pyrene[PAH] (ppt)	.0002	1,000,000	200	0	Leaching from linings of water storage tanks and distribution lines	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live
(29) Carbofuran (ppb)	.04	1000	40	40	Leaching of soil fumigant used on rice and alfalfa	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live
(30) Chlordane (ppb)	.002	1000	2	0	Residue of banned termiticide	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live
(31) Dalapon (ppb)	.2	1000	200	200	Runoff from herbicide used on rights of way	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live
(32) Di(2-ethylhexyl) adipate (ppb)	.4	1000	400	400	Discharge from chemical factories	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live

(33) Di(2-ethylhexyl) phthalate (ppb)	.006	1000	6	0	Discharge from rubber and chemical factories	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live
(34) Dibromochloropropane (ppt)	.0002	1,000,000	200	0	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live
(35) Dinoseb (ppb)	.007	1000	7	7	Runoff from herbicide used on soybeans and vegetables	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live
(36) Diquat (ppb)	.02	1000	20	20	Runoff from herbicide use	Some people who in excess of the MCL over many years, live with kidney damage to their kidneys, live

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(37) Dioxin [2,3,7,8-TCDD] (ppq)	.00000003	1,000,000,000	30	0	Emissions from waste incineration and other combustion; Discharge from chemical factories	Some people who over many years, have an increased
(38) Endothall (ppb)	.1	1000	100	100	Runoff from herbicide use	Some people who MCL over many or intestines.
(39) Endrin (ppb)	.002	1000	2	2	Runoff of banned insecticide	Some people who over many years
(40) Epichlorohydrin	TT	-	TT	0	Discharge from industrial chemical factories; An impurity of some water treatment chemicals	Some people who over a long period may have an incre
(41) Ethylene dibromide (ppt)	.00005	1,000,000	50	0	Discharge from petroleum refineries	Some people who of the MCL over liver, stomach, re increased risk of s
(42) Glyphosate (ppb)	.7	1000	700	700	Runoff from herbicide use	Some people who MCL over many reproductive diffi
(43) Heptachlor (ppt)	.0004	1,000,000	400	0	Residue of banned pesticide	Some people who MCL over many increased risk of s
Contaminant (units)	traditional MCL in mg/l	to convert for CCR, multiply by	MCL in CCR units	MCLG	Major Sources in Drinking Water	
(44) Heptachlor epoxide (ppt)	.0002	1,000,000	200	0	Breakdown of heptachlor	Some people who of the MCL over have an increased
(45) Hexachlorobenzene (ppb)	.001	1000	1	0	Discharge from metal refineries and agricultural chemical factories	Some people who of the MCL over or kidneys or adv risk of getting car
(46) Hexachlorocyclopentadiene (ppb)	.05	1000	50	50	Discharge from chemical factories	Some people who well in excess of with their stomac
(47) Lindane (ppt)	.0002	1,000,000	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens	Some people who over many years
(48) Methoxychlor (ppb)	.04	1000	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock	Some people who MCL over many
(49) Oxamyl [Vydate] (ppb)	.2	1000	200	200	Runoff/leaching from insecticide used on apples, potatoes and tomatoes	Some people who the MCL over ma effects.
(50) PCBs [Polychlorinated biphenyls] (ppt)	.0005	1,000,000	500	0	Runoff from landfills; Discharge of waste chemicals	Some people who over many years their thymus gland system difficultie
(51) Pentachlorophenol (ppb)	.001	1000	1	0	Discharge from wood preserving factories	Some people who of the MCL over or kidneys, and n

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(52) Picloram (ppb)	.5	1000	500	500	Herbicide runoff	Some people who MCL over many
(53) Simazine (ppb)	.004	1000	4	4	Herbicide runoff	Some people who MCL over many
(54) Toxaphene (ppb)	.003	1000	3	0	Runoff/leaching from insecticide used on cotton and cattle	Some people who MCL over many kidneys, or liver
Volatile Organic Contaminants						
Contaminant (units)	traditional MCL in mg/l	to convert for CCR, multiply by	MCL in CCR units	MCLG	Major Sources in Drinking Water	
(55) Benzene (ppb)	.005	1000	5	0	Discharge from factories; Leaching from gas storage tanks and landfills	Some people who MCL over many platelets, and may
(56) Carbon tetrachloride (ppb)	.005	1000	5	0	Discharge from chemical plants and other industrial activities	Some people who of the MCL over and may have an
(57) Chloramines (ppm)	MRDL = 4	-	MRDL = 4	MRDLG = 4	Water additive used to control microbes	Some people who the MRDL could Some people who the MRDL could
(58) Chlorine (ppm)	MRDL = 4	-	MRDL = 4	MRDLG = 4	Water additive used to control microbes	Some people who MRDL could exp people who drink MRDL could exp
(59) Chlorite (ppm)	1	-	1	0.8	By-product of drinking water chlorination	Some infants and in excess of the M effects may occur containing chlorit experience anemi
(60) Chlorine dioxide (ppb)	MRDL = .8	1000	MRDL = 800	MRDLG = 800	Water additive used to control microbes	Some infants and dioxide in excess effects. Similar e drink water conta people may exper
(62) o-Dichlorobenzene (ppb)	.6	1000	600	600	Discharge from industrial chemical factories	Some people who excess of the MC their liver, kidney
(63) p-Dichlorobenzene (ppb)	.075	1000	75	75	Discharge from industrial chemical factories	Some people who of the MCL over liver, kidneys, or
(64) 1,2-Dichloroethane (ppb)	.005	1000	5	0	Discharge from industrial chemical factories	Some people who of the MCL over cancer.
Contaminant (units)	traditional MCL in mg/l	to convert for CCR, multiply by	MCL in CCR units	MCLG	Major Sources in Drinking Water	
(65) 1,1-Dichloroethylene (ppb)	.007	1000	7	7	Discharge from industrial chemical factories	Some people who excess of the MC their liver.

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(66) <u>cis-1,2-Dichloroethylene (ppb)</u>	<u>.07</u>	<u>1000</u>	<u>70</u>	<u>70</u>	<u>Discharge from industrial chemical factories</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer.</u>
(67) <u>trans-1,2-Dichloroethylene (ppb)</u>	<u>.1</u>	<u>1000</u>	<u>100</u>	<u>100</u>	<u>Discharge from industrial chemical factories</u>	<u>Some people who are well in excess of the MCL over many years and may have an increased risk of cancer.</u>
(68) <u>Dichloromethane (ppb)</u>	<u>.005</u>	<u>1000</u>	<u>5</u>	<u>0</u>	<u>Discharge from pharmaceutical and chemical factories</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer.</u>
(69) <u>1,2-Dichloropropane (ppb)</u>	<u>.005</u>	<u>1000</u>	<u>5</u>	<u>0</u>	<u>Discharge from industrial chemical factories</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer.</u>
(70) <u>Ethylbenzene (ppb)</u>	<u>.7</u>	<u>1000</u>	<u>700</u>	<u>700</u>	<u>Discharge from petroleum refineries</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer or kidneys.</u>
(71) <u>Styrene (ppb)</u>	<u>.1</u>	<u>1000</u>	<u>100</u>	<u>100</u>	<u>Discharge from rubber and plastic factories; Leaching from landfills</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer, kidneys, or circulatory system.</u>
(72) <u>Tetrachloroethylene (ppb)</u>	<u>.005</u>	<u>1000</u>	<u>5</u>	<u>0</u>	<u>Discharge from factories and dry cleaners</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer.</u>
(73) <u>1,2,4-Trichlorobenzene (ppb)</u>	<u>.07</u>	<u>1000</u>	<u>70</u>	<u>70</u>	<u>Discharge from textile-finishing factories</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer, adrenal glands, and kidneys.</u>
(74) <u>1,1,1-Trichloroethane (ppb)</u>	<u>.2</u>	<u>1000</u>	<u>200</u>	<u>200</u>	<u>Discharge from metal degreasing sites and other factories</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer, their liver, nervous system, and kidneys.</u>
(75) <u>1,1,2-Trichloroethane (ppb)</u>	<u>.005</u>	<u>1000</u>	<u>5</u>	<u>3</u>	<u>Discharge from industrial chemical factories</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer, liver, kidneys, or nervous system.</u>
<u>Contaminant (units)</u>	<u>traditional MCL in mg/l</u>	<u>to convert for CCR, multiply by</u>	<u>MCL in CCR units</u>	<u>MCLG</u>	<u>Major Sources in Drinking Water</u>	
(76) <u>Trichloroethylene (ppb)</u>	<u>.005</u>	<u>1000</u>	<u>5</u>	<u>0</u>	<u>Discharge from metal degreasing sites and other factories</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer.</u>
(77) <u>TTHMs [Total trihalomethanes] (ppb)</u>	<u>.10</u>	<u>1000</u>	<u>100</u>	<u>n/a</u>	<u>By-product of drinking water chlorination</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer, kidneys, or central nervous system.</u>
(78) <u>Toluene (ppm)</u>	<u>1</u>	<u>-</u>	<u>1</u>	<u>1</u>	<u>Discharge from petroleum factories</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer, kidneys, or liver.</u>
(79) <u>Vinyl Chloride (ppb)</u>	<u>.002</u>	<u>1000</u>	<u>2</u>	<u>0</u>	<u>Leaching from PVC piping; Discharge from plastic factories</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer.</u>
(80) <u>Xylenes (ppm)</u>	<u>10</u>	<u>-</u>	<u>10</u>	<u>10</u>	<u>Discharge from petroleum factories; Discharge from chemical factories</u>	<u>Some people who are in excess of the MCL over many years and may have an increased risk of cancer.</u>

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I certify that this regulation is full, true, and correctly dated.

E. Anne Peterson, M.D., M.P.H.
State Health Commissioner
Virginia Department of Health

Date: _____