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**NOTICE OF PROPOSED RULEMAKING**  
INCLUDING STATEMENT OF NEED & FISCAL IMPACT

CHAPTER 333  
OREGON HEALTH AUTHORITY  
PUBLIC HEALTH DIVISION

**FILED**

10/27/2022 9:27 PM  
ARCHIVES DIVISION  
SECRETARY OF STATE

FILING CAPTION: Lead service lines; arsenic treatment monitoring; backflow, cross connection and cyanotoxin updates; and miscellaneous clarifications

LAST DAY AND TIME TO OFFER COMMENT TO AGENCY: 11/30/2022 5:00 PM

*The Agency requests public comment on whether other options should be considered for achieving the rule's substantive goals while reducing negative economic impact of the rule on business.*

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Filed By:  
Public Health Division  
Rules Coordinator

HEARING(S)

*Auxiliary aids for persons with disabilities are available upon advance request. Notify the contact listed above.*

DATE: 11/17/2022

TIME: 2:00 PM

OFFICER: Staff

ADDRESS: Microsoft Teams - Video/teleconference call

Due to COVID-19 some public meetings are  
being held virtually

Portland, OR 97232

SPECIAL INSTRUCTIONS:

Due to COVID-19, some public meetings are being held remotely. To provide oral testimony during this hearing, please contact publichealth.rules@odhsoha.oregon.gov to register and receive the link for the Microsoft Teams video conference. Alternatively, you may dial 971-277-2343, Phone Conference ID 229 228 136# for audio only.

Accessibility Statement: For individuals with disabilities or individuals who speak a language other than English, OHA can provide free help. Some examples are: sign language and spoken language interpreters, real-time captioning, braille, large print, audio, and written materials in other languages. If you need help with these services, please contact the Public Health Division at 971-673-1222, 711 TTY or publichealth.rules@odhsoha.oregon.gov at least 48 hours before the meeting. All relay calls are accepted. To best ensure our ability to provide a modification please contact us if you are considering attending the meeting and require a modification. The earlier you make a request the more likely we can meet the need.

NEED FOR THE RULE(S)

The Oregon Health Authority (Authority), Public Health Division, Drinking Water Services section proposes to permanently amend Oregon Administrative Rules in chapter 333, division 61 to add lead service line inventory

requirements, specify monitoring frequency when treatment for arsenic contamination is used, update requirements for backflow and cross connection protection, reduce levels triggering increased cyanotoxin monitoring and process miscellaneous clarifications or improvements in rule text. These amendments are needed to maintain consistency with federal lead service line inventory requirements, to ensure proper operation after treatment for arsenic contamination is installed with more frequent monitoring, to better protect public health with lower levels triggering increased cyanotoxin monitoring, and to clarify or improve rule text.

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#### DOCUMENTS RELIED UPON, AND WHERE THEY ARE AVAILABLE

OAR chapter 333, division 61: <https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=1273>

ORS chapter 448: [https://www.oregonlegislature.gov/bills\\_laws/ors/ors448.html](https://www.oregonlegislature.gov/bills_laws/ors/ors448.html).

Code of Federal Regulations, Title 40, Part 141: <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-141?toc=1>

OAR chapter 333, division 061 and ORS chapter 448 are also available for inspection at the Oregon Health Authority, Drinking Water Services, 800 NE Oregon Street, Suite 640, Portland, OR 97232 or by calling 971-673-0405.

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#### STATEMENT IDENTIFYING HOW ADOPTION OF RULE(S) WILL AFFECT RACIAL EQUITY IN THIS STATE

Amendment of these rules is not expected to affect racial equity within Oregon because public water system classification is based strictly upon the population served by the water system, type of water source used for drinking water and possible contamination of the water supply. Additionally, these regulations are applied equally to water systems overseen by the Authority, regardless of the location of the water system within Oregon. Economic disparities may affect water system compliance, resulting in a reduced financial capacity for operations and maintenance at some water systems. The Authority attempts to address disparities through funding and assistance opportunities targeting water systems with reduced financial capacity.

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#### FISCAL AND ECONOMIC IMPACT:

Water suppliers will incur additional costs where water service line composition is unknown and staff are required to determine the material composition of the water lines. Water suppliers may incur additional costs at water systems where treatment for arsenic is operated if arsenic monitoring is not already assigned at an appropriate frequency. Water suppliers may incur additional costs if physical gaps are required where treatment is bypassed and for calibrating backflow testing equipment. Water suppliers will incur additional costs if cyanotoxin monitoring is triggered more frequently due to lower trigger levels.

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#### COST OF COMPLIANCE:

*(1) Identify any state agencies, units of local government, and members of the public likely to be economically affected by the rule(s). (2) Effect on Small Businesses: (a) Estimate the number and type of small businesses subject to the rule(s); (b) Describe the expected reporting, recordkeeping and administrative activities and cost required to comply with the rule(s); (c) Estimate the cost of professional services, equipment supplies, labor and increased administration required to comply with the rule(s).*

(1) The proposed rule amendments are not expected to impact regulatory officials and there is no anticipated cost of compliance impact on state agencies or units of local government. The proposed rule amendments have no direct cost to the public but there may be an indirect cost to the public if some water suppliers choose to raise rates due to the expense of lead service line inventory requirements or other rule amendments.

(2)(a) Some public water systems are operated by small businesses, including mobile home parks, recreational vehicle parks, private campgrounds, restaurants, tourist accommodations, stores, and other places of employment. Less than

1,000 public water systems are estimated to be operated by a small business.

(b) The proposed amendments will require some additional administrative activities when water system personnel inventory material composition of water service lines. Monitoring and reporting costs may increase by a small amount for water system where additional monitoring for arsenic or cyanotoxins are required.

(c) The proposed amendments may require additional equipment or supplies if air gaps are added when treatment is bypassed or backflow field test kits meet new standards. Additional labor or administrative costs are expected for personnel at water systems where water line inventory is required.

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DESCRIBE HOW SMALL BUSINESSES WERE INVOLVED IN THE DEVELOPMENT OF THESE RULE(S):

The Drinking Water Advisory Committee, which includes representatives for certified water system operators and privately-owned public water systems, has reviewed the proposed rules and related rulemaking documents, including this Statement of Need and Fiscal Impact form.

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WAS AN ADMINISTRATIVE RULE ADVISORY COMMITTEE CONSULTED? YES

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RULES PROPOSED:

333-061-0034, 333-061-0036, 333-061-0040, 333-061-0050, 333-061-0060, 333-061-0070, 333-061-0071, 333-061-0072, 333-061-0073, 333-061-0074, 333-061-0087, 333-061-0098, 333-061-0220, 333-061-0540, 333-061-0550, 333-061-0560

AMEND: 333-061-0034

RULE SUMMARY: Amend OAR 333-061-0034: The Treatment Requirements and Performance Standards for Corrosion Control rule was amended to clarify that corrosion control studies must be approved by the Authority prior to treatment installation.

CHANGES TO RULE:

333-061-0034

Treatment Requirements and Performance Standards for Corrosion Control ¶¶

(1) At community and NTNC water systems, when the action level for lead or copper is exceeded, water suppliers must take the following actions as approved by the Authority:¶¶

(a) Comply with the applicable corrosion control treatment requirements specified in sections (2) and (3) of this rule;¶¶

(b) Implement the applicable source water treatment requirements specified in section (4) of this rule;¶¶

(c) Implement the public education requirements specified in section (5) of this rule; and¶¶

(d) Monitor lead or copper in tap water, water quality parameters and lead and copper in source water according to 333-061-0036(10) and analyze the monitoring results according to OAR 333-061-0036(1).¶¶

(e) Failure to comply with the applicable requirements prescribed in this rule constitutes a violation of the rule.¶¶

(2) The corrosion control treatment requirements specified in section (3) of this rule must be completed based on the size of the water system as specified in this section.¶¶

(a) At water systems serving more than 50,000 people, water suppliers must maintain and operate Authority-specified optimal water quality control parameters as prescribed in subsection (3)(m) of this rule and monitor lead and copper in tap water according to OAR 333-061-0036(10)(a) through (e).¶¶

(b) At water systems serving 50,000 people or less, except at systems where the Authority considers optimized corrosion control treatment to be present according to paragraphs (2)(d)(A) through (C) of this rule, water suppliers must complete the applicable corrosion control steps identified in paragraphs (2)(b)(A) through (I) of this rule when sample results exceed the action level for lead or copper.¶¶

(A) Water suppliers must recommend optimal corrosion control treatment within six months after the end of the monitoring period when sample results exceed the action level.¶¶

(B) Water suppliers must perform corrosion control studies within 12 months after the end of the monitoring period when sample results exceed the action level, if required by the Authority.¶

(C) If the Authority requires corrosion control studies according to paragraph (2)(b)(B) of this rule, the water supplier must complete the studies within 18 months.¶

(D) The Authority shall designate optimal corrosion control treatment within six months after a water supplier completes corrosion control studies according to paragraph (2)(b)(C) of this rule.¶

(E) If the Authority does not require corrosion control studies according to paragraph (2)(b)(B) of this rule, the Authority shall designate optimal corrosion control treatment:¶

(i) Within 18 months for water systems serving 3,301 to 50,000 people; or¶

(ii) Within 24 months for water systems serving 3,300 people or less.¶

(F) Water suppliers must install optimal corrosion control treatment within 24 months after the Authority designates optimal corrosion control treatment.¶

(G) Water suppliers must complete follow-up monitoring according to OAR 333-061-0036(10)(d)(B) within 12 months after the deadline designated by the Authority to install optimal corrosion control treatment.¶

(H) The Authority shall designate optimal water quality control parameters within 6 months after a water supplier completes follow-up monitoring.¶

(I) Water suppliers must monitor according to OAR 333-061-0036(10)(f) and operate treatment such that the Authority-designated optimal water quality control parameters are met at all times.¶

(c) At any water system where the corrosion control steps specified in subsection (2)(b) of this rule are required because the action level for lead or copper was exceeded, the water supplier may cease completing the treatment steps if sample results subsequently collected according to OAR 333-061-0036(10)(d) are at or below the action levels for both lead and copper during each of two consecutive monitoring periods. If any such water system thereafter exceeds the lead or copper action level during any monitoring period, the water supplier (or the Authority if applicable) shall recommence completing the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety. The Authority may require a water supplier to repeat treatment steps previously completed if the Authority determines it is necessary to properly implement the treatment requirements specified in this rule. The Authority shall notify the water supplier in writing of such a determination and explain the basis for its decision.¶

(d) At any water system considered to have optimized corrosion control according to this subsection, water suppliers must operate and maintain existing corrosion control treatment and also comply with any requirements determined to be necessary by the Authority. The Authority considers optimized corrosion control treatment to be present at a water system and that the corrosion control treatment steps identified in this section are not required if at least one of the criteria identified in this subsection is met.¶

(A) At water systems serving 50,000 people or less, sample results are consistently at or below the lead and copper action levels and no more than one round of samples has exceeded the action level at the water system.¶

(B) At any water system where the water supplier demonstrated to the Authority's satisfaction that it conducted activities equivalent to the corrosion control steps identified in paragraphs (2)(b)(A) through (H) of this rule. If the Authority makes this determination, it shall provide the water supplier written notice explaining the basis for the decision and specifying the water quality control parameters representing optimal corrosion control according to subsection (3)(l) of this rule. At water systems considered to have optimized corrosion control treatment according to this paragraph, water suppliers must operate the treatment in compliance with the Authority-designated optimal water quality control parameters according to subsection (3)(m) of this rule and monitor for lead and copper and water quality parameters according to OAR 333-061-0036(10)(d) and OAR 333-061-0036(10)(f), respectively. Water suppliers must provide the Authority with the following information to allow a determination according to this paragraph:¶

(i) The results of all samples collected for each of the water quality parameters identified in subsection (3)(d) of this rule;¶

(ii) A report explaining the test methods used by the water supplier to evaluate the corrosion control treatments listed in subsection (3)(c) of this rule, the results of all tests conducted, and the basis for the water supplier's selection of optimal corrosion control treatment;¶

(iii) A report explaining how corrosion control was installed and how it is maintained to ensure minimal lead and copper concentrations at consumers' taps; and¶

(iv) The results of tap water samples collected according to OAR 333-061-0036(10)(d)(B) at least once every six months for one year after corrosion control treatment was installed.¶

(C) At any water system where the results of tap water monitoring and source water monitoring conducted according to OAR 333-061-0036(10)(d) and (g), respectively demonstrate for two consecutive six-month monitoring periods that the difference between lead concentrations in the 90th percentile tap water sample result calculated according to OAR 333-061-0030(1)(c)(A) and the highest source water concentration is less than 0.005 mg/l.¶

(i) At water systems where the highest concentration of lead in source water is below the method detection limit, lead in the 90th percentile tap water sample result must be less than or equal to the practical quantitation level in two consecutive six month monitoring periods;¶

(ii) Water suppliers must monitor for lead and copper no less frequently than once every three years according to OAR 333-061-0036(10)(d)(D) if the Authority considers a water system to have optimized corrosion control treatment present.¶

(iii) At any water system considered to have optimized corrosion control treatment, water suppliers must notify the Authority in writing of any upcoming, long-term change in treatment (for example, changing disinfectants or corrosion control chemicals) or if a new water source will be utilized. The Authority must review and approve the changes at the water system before they are implemented by the water supplier. At any such water system, the Authority may require additional monitoring or other actions it deems appropriate to ensure minimal levels of corrosion in the water distribution system;¶

(iv) If sample results collected according to OAR 333-061-0036(10)(d) exceed the action level for lead or copper for two consecutive six month rounds at any water system where optimized corrosion control treatment is considered to be present, the water supplier must complete the corrosion control steps specified in subsection (2)(b) of this rule according to the deadlines prescribed therein.¶

(3) Water suppliers must complete the corrosion control treatment requirements described in this section as required by section (2) of this rule.¶

(a) At water systems serving 50,000 people or less and where the action level for lead or copper was exceeded, water suppliers must recommend installation of one or more of the corrosion control treatment methods listed in subsection (3)(c) of this rule that constitute optimal corrosion control for the water system in question, based upon monitoring results for lead and copper and water quality parameters. The Authority may require the water supplier to conduct additional water quality parameter monitoring according to OAR 333-061-0036(10)(f) to facilitate Authority review of the water supplier's recommendation.¶

(b) Water suppliers performing corrosion control studies must evaluate the effectiveness of each treatment method identified in this subsection and, if appropriate, combinations of the treatment methods to identify optimal corrosion control treatment for a system. Studies must be submitted to and approved by the Authority according to OAR 333-061-0060 prior to installation of treatment. Water suppliers must evaluate each of the corrosion control treatment methods using either pipe rig/loop tests, metal coupon tests, partial-system tests, or analyses based on documented analogous treatments at other water systems of similar size and with similar water chemistry and distribution system configuration. Treatment methods include:¶

(A) Alkalinity and pH adjustment;¶

(B) Calcium hardness adjustment; and¶

(C) The addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.¶

(c) Water suppliers must measure the following water quality parameters in any tests before, during or after evaluating the corrosion control treatment methods listed in subsection (3)(b) of this rule:¶

(A) Lead;¶

(B) Copper;¶

(C) pH;¶

(D) Alkalinity;¶

(E) Calcium;¶

(F) Conductivity;¶

(G) Orthophosphate (when an inhibitor containing a phosphate compound is used);¶

(H) Silicate (when an inhibitor containing a silicate compound is used); and¶

(I) Water temperature.¶

(d) Any additional chemical treatment methods considered by a water supplier must be evaluated by conducting appropriate studies and analyses approved by the Authority that are equivalent in scope to the studies and analyses required in this section.¶

(e) Water suppliers must identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least one of the following:¶

(A) Data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used at another water system with comparable water quality characteristics; or¶

(B) Data and documentation demonstrating that the water supplier previously attempted to evaluate a particular corrosion control treatment and found that the treatment is ineffective or adversely affects other water quality treatment processes.¶

(f) Water suppliers must evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.¶

- (g) Water suppliers must recommend to the Authority in writing the treatment option that corrosion control studies indicate constitutes optimal corrosion control treatment for a water system on the basis of an analysis of the data generated during each evaluation. The water supplier must provide a rationale for its recommendation along with all supporting documentation specified in subsections (3)(b) through (f) of this rule.¶
- (h) The Authority shall either approve the corrosion control treatment option recommended by the water supplier or designate a different corrosion control treatment method listed in subsection (3)(b) of this rule after considering available information, including where applicable, studies performed according to subsection (3)(b) through (f) of this rule and a water supplier's recommended alternative. When designating optimal treatment, the Authority shall consider the effects that additional corrosion control treatment will have on water quality parameters and on other water quality treatment processes.¶
- (i) Water suppliers must provide additional information upon request if necessary for the Authority's review. The Authority shall notify water suppliers in writing of decisions about optimal corrosion control treatment and explain the basis for any determination.¶
- (j) Water suppliers must properly install and operate the optimal corrosion control treatment designated by the Authority according to subsection (3)(h) of this rule throughout a water distribution system.¶
- (k) The Authority shall evaluate the results of all lead and copper tap samples and water quality parameter samples reported by water suppliers and determine whether the water supplier properly installed and operated the optimal corrosion control treatment designated by the Authority. The Authority shall designate values for the optimal water quality control parameters after reviewing the results of tap water and water quality parameter monitoring from both before and after the water supplier installs optimal corrosion control treatment. The Authority may also designate values for additional water quality control parameters if determined necessary to reflect optimal corrosion control for a water system. The Authority shall notify the water supplier in writing of these determinations and explain the basis for its decisions. The optimal water quality control parameters designated by the Authority shall include:¶
- (A) A minimum value or a range of values for pH measured at each entry point to the distribution system;¶
- (B) A minimum pH value, measured in all tap samples. Such value shall be 7.0, unless the Authority determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the system to optimize corrosion control;¶
- (C) If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that the Authority determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system;¶
- (D) If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples; and¶
- (E) If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples.¶
- (l) At all water systems where optimal corrosion control was installed, water suppliers must continue to operate and maintain the corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the Authority according to subsection (3)(k) of this rule for all samples collected according to OAR 333-061-0036(10)(f). Compliance shall be determined every six months as specified in OAR 333-061-0036(10)(f)(H). A water system is out of compliance for a six-month period if any Authority-designated water quality parameter is not met on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a sampling location is below the minimum value or outside the range designated by the Authority. Daily values are calculated as follows:¶
- (A) On days when more than one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the average of all results collected during the day regardless of whether they are collected through continuous monitoring, grab sampling or a combination of both;¶
- (B) On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the result of that measurement; and¶
- (C) On days when no measurement is collected for the water quality parameter at the sampling location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample site.¶
- (m) The Authority may, upon its own initiative or in response to a water supplier or other interested party, modify its determination of the optimal corrosion control treatment designated according to subsection (3)(h) of this rule or of the optimal water quality control parameters designated according to subsection (3)(k) of this rule. A request for modification from a water supplier or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The Authority may modify its determination where it concludes that such change is necessary to ensure that a water supplier continues to optimize corrosion control treatment. A revised determination shall be made in writing, set forth the new treatment requirements, explain

the basis for the Authority's decision, and provide an implementation schedule for completing the treatment modifications.¶

(4) Source water treatment requirements.¶

(a) Water suppliers must complete the applicable source water monitoring and treatment requirements specified in subsection (4)(b) of this rule and in OAR 333-061-0036(10)(g) by the deadlines identified in this subsection.¶

(A) At water systems where the lead or copper action level was exceeded, water suppliers must complete lead and copper source water monitoring as prescribed by OAR 333-061-0036(10)(g) and make a treatment recommendation to the Authority as prescribed by paragraph (4)(b)(A) of this rule no later than 180 days after the end of the monitoring period during which the lead or copper action level was exceeded.¶

(B) The Authority shall make a determination regarding source water treatment as prescribed in paragraph (4)(b)(B) of this rule within six months after submission of monitoring results collected according to paragraph (4)(a)(A) of this rule.¶

(C) If the Authority requires installation of source water treatment, the water supplier must install the treatment as prescribed in paragraph (4)(b)(C) of this rule within 24 months after completing the requirements prescribed in paragraph (4)(a)(B) of this rule.¶

(D) Water suppliers must complete follow-up tap water and source water monitoring as prescribed by OAR 333-061-0036(10)(d) and (g) within 12 months after the deadline prescribed by paragraph (4)(a)(C) of this rule.¶

(E) The Authority shall review the water supplier's installation and operation of source water treatment and specify maximum permissible source water levels as prescribed by paragraph (4)(b)(D) of this rule within 6 months after a water supplier completes the requirements prescribed by paragraph (4)(a)(D) of this rule.¶

(F) Water suppliers must operate in compliance with the Authority-specified maximum permissible lead and copper source water levels as prescribed in paragraph (4)(b)(D) of this rule and continue source water monitoring as prescribed in OAR 333-061-0036(10)(g).¶

(b) Source water treatment evaluation and installation.¶

(A) At any water system where the lead or copper action level was exceeded, water suppliers must recommend in writing to the Authority the installation and operation of one of the source water treatment methods listed in paragraph (4)(b)(B) of this rule. A water supplier may recommend that treatment is not necessary based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at users' taps.¶

(B) The Authority shall evaluate the results of all source water samples submitted for a water system to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to users' taps. If the Authority determines that treatment is necessary, the Authority shall either require installation and operation of the source water treatment recommended by the water supplier or require the installation and operation of another source water treatment method from among the following: ion exchange, reverse osmosis, lime softening or coagulation/filtration. If the Authority requests additional information to aid in its review, the water supplier must provide the information by the date specified by the Authority in its request. The Authority shall notify the water supplier in writing of its determination and set forth the basis for its decision.¶

(C) Each water supplier must properly install and operate the source water treatment designated by the Authority according to paragraph (4)(b)(B) of this rule.¶

(D) The Authority shall review the source water samples collected both before and after the installation of source water treatment and determine whether the water supplier properly installed and operated the source water treatment designated by the Authority. The Authority shall designate the maximum permissible lead and copper concentrations for finished water entering the distribution system based upon its review. Such concentrations shall reflect the contaminant removal capability of the treatment properly operated and maintained. The Authority shall notify the water supplier in writing and explain the basis for its decision.¶

(E) Water suppliers must maintain lead and copper below the maximum permissible concentrations designated by the Authority at each sampling point monitored according to OAR 333-061-0036(10)(g). Water suppliers violate this rule if the concentration of lead or copper at any sampling point is greater than the maximum permissible concentration designated by the Authority.¶

(F) The Authority may, upon its own initiative or in response to a water supplier or other interested party, modify its determination of the source water treatment designated according to paragraph (4)(b)(B) of this rule or of the maximum permissible lead and copper concentrations for finished water entering the distribution system designated according to paragraph (4)(b)(D) of this rule. A request for modification from a water supplier or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The Authority may modify its determination where it concludes that such change is necessary to ensure that a water supplier continues to minimize lead and copper concentrations in source water. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the Authority's decision, and provide an implementation schedule for completing the treatment modifications.¶

(5) Water suppliers must deliver a consumer notice of lead tap water monitoring results to persons served by the water system at sites that are tested, as specified in subsection (5)(e) of this rule. At water systems where the lead

action level is exceeded, water suppliers must sample the tap water of any customer who requests the sampling according to subsection (5)(d) of this rule. At water systems where the lead action level is exceeded based on tap water samples collected according to OAR 333-061-0036(10)(d), water suppliers must deliver the public education materials described in subsections (5)(a) and (b) of this rule according to the requirements prescribed by subsection (5)(c) of this rule.¶

(a) For community and NTNC water system, water suppliers must include the elements identified in paragraphs (5)(a)(A) through (F) of this rule and in the same order they are listed in all printed materials distributed through a lead public education program. Paragraphs (5)(a)(A), (B) and (F) of this rule must be included in the materials exactly as written except for the text in braces for which the water supplier must include system-specific information. Any additional information presented by a water supplier shall be consistent with the information below and be in plain language that can be understood by the general public. Water suppliers must submit all written public education materials to the Authority prior to delivery to water users.¶

(A) IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. Personnel at {INSERT NAME OF WATER SYSTEM} found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.¶

(B) HEALTH EFFECTS OF LEAD: Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of the body. The greatest risk of lead exposure is to infants, young children and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.¶

(C) SOURCES OF LEAD.¶

(i) Explain what lead is.¶

(ii) Explain the possible sources of lead in drinking water and how lead enters drinking water. Include information on home/building plumbing materials and service lines that contain lead.¶

(iii) Discuss other important sources of lead exposure in addition to drinking water (for example, paint).¶

(D) STEPS THE CONSUMER CAN TAKE TO REDUCE THEIR EXPOSURE TO LEAD IN DRINKING WATER.¶

(i) Encourage running the water to flush out the lead.¶

(ii) Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula.¶

(iii) Explain that boiling water does not reduce lead levels.¶

(iv) Discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.¶

(v) Suggest that parents have their child's blood tested for lead.¶

(E) Explain why there are elevated levels of lead in the system's drinking water (if known) and what will be done to reduce the lead levels in homes/buildings in this area.¶

(F) For more information, call us at {INSERT YOUR NUMBER}, {(if applicable include the following) or visit our web site at {INSERT YOUR WEB SITE HERE}}. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's web site at <http://www.epa.gov/lead> or contact your health care provider.¶

(b) For community water systems, water suppliers must also:¶

(A) Tell consumers how to get their water tested; and¶

(B) Discuss lead in plumbing components and the difference between low lead and lead free.¶

(c) Delivery of public education materials.¶

(A) For public water systems serving a large proportion of non-English speaking consumers as determined by the Authority, the public education materials must include information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the public education materials or to request assistance in the appropriate language.¶

(B) At community water systems where the lead action level was exceeded in tap water samples collected according to OAR 333-061-0036(10)(d), water suppliers must conduct the public education tasks specified in this section within 60 days after the end of the monitoring period in which the exceedance occurred unless the water supplier is already conducting public education tasks according to this rule. Water suppliers must:¶

(i) Deliver printed materials meeting the content requirements of subsections (5)(a) and (5)(b) of this rule to all bill paying customers.¶

(ii) Deliver education materials that meet the requirements of subsections (5)(a) and (5)(b) of this rule to local public health agencies even if they are not located within the water system's service area for customers who are



most at risk, including an informational notice that encourages distribution to all the organization's potentially affected clients. The water supplier must contact the local public health agencies directly by phone or in person. The local public health agencies may provide a list of additional community based organizations serving target populations, which may include organizations outside the service area of the water system. If such lists are provided, water suppliers must deliver education materials that meet the content requirements of subsections (5)(a) and (5)(b) of this rule to all organizations on the provided lists.¶

(iii) Delivering education materials that meet the requirements of subsections (5)(a) and (5)(b) of this rule to public and private schools or school boards; Women, Infants and children (WIC), and Head Start programs; public and private hospitals and medical clinics; Pediatricians; family planning clinics; and local welfare agencies located within the water system's service area for customers who are most at risk, including an informational notice that encourages distribution to all of the organization's potentially affected clients.¶

(iv) Make a good faith effort to locate licensed childcare centers; public and private preschools; and Obstetricians-Gynecologists and Midwives within the service area and deliver materials that meet the requirements of subsections (5)(a) and (5)(b) of this rule to them, including an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of these organizations from the local public health agencies, even if the agencies are not located within the water system's service area.¶

(v) No less often than quarterly, provide information on or in each water bill as long as samples at the water system exceed the action level for lead. The message on the water bill must include the following statement exactly as written except for the text in braces for which the water system must include system-specific information: {INSERT NAME OF WATER SYSTEM} found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information please call {INSERT NAME OF WATER SYSTEM}, {(if applicable include the following) or visit our web site at {INSERT YOUR WEB SITE HERE}}. The message or delivery mechanisms can be modified in consultation with the Authority; specifically the Authority may allow a separate mailing of public education materials to customers if the water system cannot place the information on water bills.¶

(vi) Post material meeting the requirements of subsection (5)(a) and (5)(b) of this rule on the water system's web site if the system serves a population greater than 100,000.¶

(vii) Submit a press release to newspaper, television and radio stations.¶

(viii) Implement at least three of the following activities: public service announcements; paid advertisements; public area information displays; emails to customers; public meetings; household deliveries, targeted individual customer contact; direct material distribution to all multi-family homes and institutions or other methods approved by the Authority. The educational content and selection of these activities must be determined in consultation with the Authority.¶

(ix) For the purposes of paragraph (5)(c)(B) of this rule, at water systems where monitoring is annually or less frequent, the end of the monitoring period is considered to be September 30 of the calendar year in which monitoring occurs, or, if the Authority has established an alternate monitoring period, the last day of that period.¶

(C) As long as sample results exceed the action level at community water systems, water suppliers must repeat the activities in subsection (5)(c) of this rule as follows:¶

(i) Repeat the tasks contained in (5)(c)(B)(i),(ii),(iii),(iv) and (viii) of this rule every 12 months;¶

(ii) Repeat tasks contained in (5)(c)(B)(v) of this rule with each billing cycle;¶

(iii) At water systems serving more than 100,000 people, post and retain material on a publicly accessible web site pursuant to (5)(c)(B)(vi) of this rule;¶

(iv) Repeat the task in (5)(c)(B)(vii) of this rule twice every 12 months on a schedule agreed upon with the Authority. The Authority can allow activities in (5)(c)(B) of this rule to extend beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis, however, this extension must be approved in writing by the Authority in advance of the 60-day deadline.¶

(D) At NTNC water systems, water suppliers must deliver the public education materials specified by (5)(a) of this rule within 60 days after the end of the monitoring period in which samples exceeded the action level unless the water supplier is already conducting public education tasks according to this rule. Water suppliers must:¶

(i) Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system; and¶

(ii) Distribute informational pamphlets or brochures about lead in drinking water to each person served by the water system. The Authority may allow the water supplier to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.¶

(iii) For the purposes of paragraph (5)(c)(B) of this rule, at water systems where monitoring is annually or less frequent, the end of the monitoring period is considered to be September 30 of the calendar year in which monitoring occurs, or, if the Authority has established an alternate monitoring period, the last day of that period.¶

(E) Repeat the tasks contained in (5)(c)(D) at least once during each calendar year in which sample results exceed

the action level. The Authority can allow activities to extend beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis, however, this extension must be approved in writing by the Authority in advance of the 60-day deadline.¶¶

(F) Water suppliers may discontinue delivery of public education materials if sample results collected according to OAR 333-061-0036(10)(d) have met the lead action level during the most recent six-month monitoring period. Water suppliers must recommence public education if samples subsequently exceed the lead action level during any monitoring period.¶¶

(G) The water supplier for a community water system may request in writing to use only the text specified in (5)(a) of this rule in lieu of the text in (5)(a) and (5)(b) of this rule and to perform the tasks listed in (5)(c)(D) and (E) in lieu of the tasks in (5)(c)(B) and (C) of this rule if:¶¶

(i) The water system is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices: and¶¶

(ii) The water system provides water as part of the cost of services provided and does not separately charge for water consumption.¶¶

(H) At community water systems serving 3,300 people or less, water suppliers may limit certain aspects of their public education programs as follows:¶¶

(i) Implement at least one of the activities listed in (5)(c)(B)(viii); and¶¶

(ii) Limit the distribution of the public education materials specified in (5)(c)(B)(ii), (iii) and (iv) of this rule to facilities and organizations most likely to be visited regularly by pregnant women and children.¶¶

(iii) The Authority may waive the requirements of (5)(c)(B)(vii) of this rule as long as the water supplier distributes notices to every household served by the water system.¶¶

(d) For water systems where the lead action level is exceeded on the basis of tap samples collected according to OAR 333-061-0036(10)(d), water suppliers shall offer to sample the tap water of any customer who requests it but the water supplier is not required to pay for collecting or analyzing the sample, nor is the water supplier required to collect and analyze the sample itself.¶¶

(e) Notification of results.¶¶

(A) Water suppliers must provide a notice of the individual tap results from lead tap water monitoring carried out according to OAR 333-061-0036(10)(d) to the persons served by the water system at the specific sampling site from which a sample was collected (for example, the occupants of the residence where the tap was tested).¶¶

(B) Water suppliers must provide the consumer notice as soon as practical, but no later than 30 days after learning of the tap monitoring results.¶¶

(C) The consumer notice must include the results of lead tap water monitoring for the tap that was tested, an explanation of the health effects of lead, list steps consumers can take to reduce exposure to lead in drinking water and contact information for the water utility. The notice must also provide the maximum contaminant level goal and the action level for lead and the definitions for these two terms.¶¶

(D) The Consumer notice must be provided to persons served at the tap that was tested, either by mail or by another method approved by the Authority. For example, upon approval by the Authority, at a NTNC water system, the water supplier could post the results on a bulletin board in the facility to allow users to review the information. Water supplier must provide the notice to customer at every sample tap tested, including consumers who do not receive water bills.

Statutory/Other Authority: ORS 448.131

Statutes/Other Implemented: 448.131, 448.150, 448.273

AMEND: 333-061-0036

RULE SUMMARY: Amend OAR 333-061-0036: The Sampling and Analytical Requirements rule was amended to specify increased monitoring when treatment to remove arsenic is approved by the Authority; include lead service line inventory requirements, specify the 95% standard for properly treated water must be met within the calendar month when ultraviolet light (UV) is used to treat surface water; and identify monitoring parameters when UV treatment is used for 4-log disinfection of groundwater.

CHANGES TO RULE:

333-061-0036

### Sampling and Analytical Requirements ¶¶

#### (1) General:¶¶

(a) Samples required by these rules must be analyzed using EPA approved methods set forth in 40 CFR 141 by a laboratory accredited according to OAR chapter 333, division 064 and the Oregon Environmental Laboratory Accreditation Program (ORELAP). The laboratory must be certified to analyze drinking water samples using the specific method for the contaminant being analyzed.¶¶

(A) The Authority will only accept sample results that have been handled and documented according to ORELAP standards, except as prescribed by subsection (1)(i) of this rule.¶¶

(B) Samples required by these rules must be collected after the water has been allowed to flow from the sample tap for a sufficient length of time to assure that the collected sample is representative of water in the distribution system or from the water source as applicable, except samples for lead or copper in tap water which must be collected as prescribed by subsection (10)(b) of this rule.¶¶

(b) Accredited laboratories are considered either a primary or subcontracted laboratory as specified by paragraphs (1)(b)(A) and (B) of this rule.¶¶

(A) A primary laboratory is the first accredited laboratory that receives a compliance sample for analysis, and is responsible for chain of custody documentation (if applicable), performing the analytical method on a compliance sample (if applicable), final report review, and submission of results to the water system and the Authority as specified in OAR 333-061-0040(1)(b)(B). Primary laboratories must hold primary or secondary ORELAP accreditation.¶¶

(B) A subcontracted laboratory is an accredited laboratory that performs the analytical method on a compliance sample, and is responsible for sample analysis and result reporting to the primary laboratory as specified in OAR 333-061-0040(1)(b)(B). Subcontracted laboratories must hold ORELAP primary or secondary accreditation for the appropriate method(s).¶¶

#### (c) Alternate Analytical Methods:¶¶

(A) With the written permission of the Authority, and concurred in by the Administrator of the U.S. EPA, an alternate analytical method may be employed on the condition that it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with any MCL; and¶¶

(B) The use of the alternate analytical method shall not decrease the frequency of sampling required by these rules.¶¶

#### (d) Monitoring at purchasing water systems:¶¶

(A) When a public water system obtains its water, in whole or in part, from one or more public water systems, the monitoring requirements imposed by these rules on the purchasing water system may be modified by the Authority to the extent that the system supplying the water is in compliance with its source monitoring requirements. When a public water system supplies water to one or more other public water systems, the Authority may modify monitoring requirements imposed by this rule to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes.¶¶

(B) Any modified monitoring shall be conducted pursuant to a schedule specified by the Authority and concurred in by the Administrator of the US Environmental Protection Agency.¶¶

(e) Water suppliers shall monitor each water source individually for contaminants listed in OAR 333-061-0030, except for coliform bacteria, HAA5s, TTHMs and corrosion by-products, at the entry point to the distribution system except as described below. Any such modified monitoring shall be conducted pursuant to a schedule prescribed by the Authority.¶¶

(A) At water systems drawing water from more than one source and where sources are combined before distribution, water suppliers may be allowed to sample at an entry point to the distribution system during normal operating conditions, where justified, taking into account operational considerations, geologic and hydrologic conditions, and other factors.¶¶

(B) If a water system draws water from multiple ground water sources which are not combined before

distribution, the water supplier may be allowed to sample at a representative source or sources, where justified, taking into account geologic and hydrogeologic conditions, land uses, well construction, and other factors.¶

(f) Compliance with MCLs shall be based on each sampling point as described in this section. If any point is determined to be out of compliance, the system shall be deemed out of compliance. If an entirely separated portion of a water system is out of compliance, then only that portion of the system shall be deemed out of compliance.¶

(g) The Authority may require additional sampling and analysis for the contaminants included in OAR 333-061-0030 when necessary to determine whether an unreasonable risk to health exists. The Authority may also require sampling and analysis for additional contaminants not included in OAR 333-061-0030 when necessary for public health protection.¶

(h) Water suppliers and their appointed representatives shall collect water samples from representative locations in the water system as prescribed in this rule and shall employ proper sampling procedures and techniques. Samples submitted to laboratories for analysis shall be clearly identified and shall include the name of the water system, public water system identification number, sampling date, and time, sample location identifying the sample tap and the name of the person collecting the sample.¶

(i) Measurements for turbidity, disinfectant residual, temperature, alkalinity, calcium, conductivity, chlorite, bromide, TOC, SUVA, dissolved organic carbon, UV254, orthophosphate, silica and pH may be performed on site using approved methods by individuals trained in sampling and testing techniques. Daily chlorite samples measured at the entrance to the distribution system must be performed by a party approved by the Authority.¶

(j) Nothing in these rules precludes the Authority or any of its duly authorized representatives from collecting samples and from using the results of such samples to determine compliance with applicable requirements of these rules.¶

(k) Wellfield Determination.¶

(A) At water systems possessing two or more wells that separately supply water to the distribution system, the Authority may consider those wells as a wellfield source for monitoring purposes provided the requirements of this rule are met. The Authority will determine whether the wellfield designation is appropriate based on information in a water system's source water assessment report.¶

(B) To be classified as a wellfield, wells must meet the following criteria:¶

(i) The wells must be within 2,500 feet of one another or as determined in a state approved hydrogeological study to minimize inter-well interference drawdowns. For wells located in a low-impact land use area, this criterion may be waived at the discretion of the Authority.¶

(ii) The wells must produce water from the same aquifer. This criterion is determined using source water assessment results, based on well reports, maps and other hydrogeological information.¶

(C) To be considered for wellfield designation, water suppliers must submit the following to the Authority:¶

(i) A schematic drawing showing all sources, entry points and relevant sample taps;¶

(ii) A map and description of the land use activities within the respective WHPAs (using the inventory section of the Source Water Assessment Report); and¶

(iii) A description of the pumping patterns.¶

(D) If a water system's wells are considered to comprise a wellfield, the susceptibility analysis conducted during the source water assessment is utilized to determine the sampling point(s). Table 14 summarizes the alternatives.¶

(E) To determine the most susceptible well, the area within the two-year TOT is considered. The Authority will consider the potential contaminant source inventory determined during the source water assessment, the aquifer sensitivity as defined in OAR 333-061-0050, pumping patterns and other pertinent hydrogeological information.¶

(F) The Authority may still designate more than one entry point within the wellfield as a sampling point if well construction or land use practices warrant. For a large area containing numerous wells, sub-wellfields may be identified, each with its own sample site designation.¶

(2) Inorganic chemicals.¶

(a) Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cyanide, Fluoride, Mercury, Nickel, Selenium and Thallium.¶

(A) Sampling at water systems for regulated inorganic chemicals shall be conducted as follows:¶

(i) At community and NTNC water systems using surface water or GWUDI sources solely or in combination with groundwater sources, water suppliers must monitor at each point in the distribution system representative of each source after treatment or at entry points to the distribution system after any application of treatment. Initial monitoring must be conducted annually at each sampling point. Samples must be collected at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.¶

(ii) At community and NTNC water systems using groundwater sources, water suppliers must monitor at each point in the distribution system representative of each source after treatment or at entry points to the distribution system representative of each source after any application of treatment. Monitoring must be

conducted once every three years at each sampling point. Samples must be collected at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.¶

(iii) At new TNC and state regulated water systems or existing TNC and state regulated water systems with new sources, water suppliers must monitor once for arsenic. Samples must be collected at the entry points to the distribution system representative of each source after any application of treatment.¶

(iv) If a system draws water from more than one source and the sources are combined before distribution, samples must be collected at an entry point to the distribution system during periods of normal operating conditions when water is representative of all the sources being used.¶

~~(v) At water systems with two or more wells that have been determined to constitute a wellfield as specified in subsection~~ Monitoring after the installation of arsenic treatment.¶

(I) At water systems where centralized treatment is approved to reduce concentrations of arsenic, water suppliers must monitor for arsenic at least once every calendar quarter according to paragraph (42)(ka)(B) of this rule, the Auth. Monitoring may approve monitoring at those entry point(s) determined to represent water quality throughout the wellfield.¶

(B) The Authority may allow compositing of samples from a maximum of 5 sampling points, provide reduced to one sample per year after monitoring results are below the MCL for arsenic for at least four consecutive calendar quarters. Monitoring may not be reduced to less frequently than once per year.¶

(II) At water systems where point-of-use (POU) treatment is approved to reduce concentrations of arsenic, water suppliers must monitor for arsenic once at every device, immediately after installation, followed by monitoring at one-third of the POU devices every calendar quarter, such that monitoring is conducted that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples is to be every POU device at least once within three calendar quarters. If both the initial and quarterly monitoring results for every POU device are below the MCL for arsenic, monitoring may be reduced to at least one sample collected at one-third of the POU devices every year. Water suppliers must monitor every POU device at least once in the laboratory. Composite samples must be analyzed every three years. If monitoring at any POU device exceeds the MCL for arsenic, the water supplier must monitor at every POU device within 1490 days of collection. If the concentration in the composite sample is equal to or greater than one-fifth of the MCL of any inorganic chemical list, Monitoring must be increased to once every calendar quarter for at least one year at any POU device where the MCL was exceeded.¶

(vi) At water systems with two or more wells that have been determined to constitute a wellfield as specified in subsection (21)(k) of this rule, then a follow-up sample must be taken for the contaminants which exceeded one-fifth of the MCL within 14 days at each sampling point included in the composite. If d Authority may approve monitoring at those entry point(s) determined to represent water quality throughout the wellfield.¶

(B) At water systems where samples exceed a MCL identified in OAR 333-061-0030, water suppliers of the original sample taken from each sampling point used in the composite are available, ers must monitor quarterly beginning in the next calendar quarter after the sample result exceeded the MCL. The Authority may decrease the water supplier may use these instead of resampling. The duplicates must be analyzed and the results reported to the Authority within 14 days of collection. If the water system serves more than 3,300 people, then compositing can only be allowed for that system. At water systems serving 3,300 people or less, compositing is allowed among multiple water systems provided the 5 sample limit is maintained quarterly monitoring requirement to the frequencies prescribed in paragraph (2)(a)(A) of this rule when the Authority determines that sample results are reliably and consistently below the MCL. Before such a decrease is permitted for a groundwater system, water suppliers must collect at least two quarterly samples or a minimum of four quarterly samples at water systems supplied by a surface water source.¶

(C) Water suppliers may apply to the Authority for a waiver from the monitoring frequencies specified in paragraph (2)(a)(A) of this rule on the condition that at least one sample is collected while the waiver is effective and the effective period for the waiver shall not exceed one nine-year compliance cycle.¶

(i) The Authority may grant a waiver provided water suppliers have monitored annually for at least three years at water systems supplied by surface water sources or have conducted a minimum of three rounds of monitoring (at least one sample shall have been collected since January 1, 1990) at water systems supplied by groundwater sources, and all analytical results are less than the MCLs prescribed in OAR 333-061-0030 for inorganic chemicals. At water systems with a new water source, a waiver may not be granted until three rounds of monitoring from the new source have been completed.¶

(ii) Waivers granted by the Authority shall be in writing and shall set forth the basis for the determination. The Authority shall review and revise, where appropriate, its determination of the appropriate monitoring frequency when the water supplier submits new monitoring data or where other data relevant to the appropriate monitoring frequency at the water system becomes available. In determining the appropriate reduced monitoring frequency, the Authority shall consider the reported concentrations from all previous monitoring; the degree of variation in reported concentrations; and other factors which may affect concentrations such as changes in groundwater

pumping rates, changes in water system configuration, changes in operating procedures, or changes in stream flows or characteristics.¶

(D) ~~At water systems where samples exceed a MCL as calculated in subsection (2)(h) of this rule, water suppliers must monitor quarterly beginning in the next quarter after the violation occurred. The Authority may decrease the quarterly monitoring requirement to the frequencies prescribed in paragraph (2)(a)(A)~~The Authority may allow compositing of samples from a maximum of five sampling points, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory. Composite samples must be analyzed within 14 days of collection. If the concentration in the composite sample is equal to or greater than one-fifth of the MCL of any inorganic chemical listed in section (2) of this rule-w, then it is determined that sample results are reliably and consistently below the MCL. Before such a decrease is permitted for a groundwater system, a follow-up sample must be taken for the contaminants which exceeded one-fifth of the MCL within 14 days of sample validation by the laboratory, at each sampling point included in the composite. If duplicates of the original sample taken from each sampling point used in the composite are available, the water suppliers must collect at least two quarterly samples or a minimum of four quarterly samples at water systems supplied by a surface water source.ay use these instead of resampling. The duplicates must be analyzed and the results reported to the Authority within 14 days of collection. For a water system serving more than 3,300 people, only samples from that water system may be composited. For water system serving 3,300 people or less, samples from multiple water systems may be composited if the five sample limit is maintained.¶

(E) At new water systems or systems that use a new source of water, water suppliers must demonstrate compliance with the MCL within a period of time specified by the Authority. The water supplier must also comply with the initial sampling frequencies specified by the Authority to demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted according to the requirements in this section.¶

(b) Asbestos:¶

(A) At community and NTNC water systems regardless of source, sampling must be conducted for Asbestos at least once during the initial three-year compliance period of each nine-year compliance cycle unless a waiver is granted by the Authority according to paragraph (2)(b)(B) of this rule.¶

(B) The Authority may grant a waiver from the monitoring prescribed by paragraph (2)(b)(A) of this rule if a water system is determined not to be vulnerable to either asbestos contamination in its source water or due to corrosion of asbestos-cement pipe, or both. If granted, the water supplier will not be required to monitor while the waiver remains in effect. A waiver remains in effect until the completion of the three year compliance period.¶

(C) At water systems vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe, one sample must be collected at a tap served by the asbestos-cement pipe under conditions where asbestos contamination is most likely to occur.¶

(D) At water systems vulnerable to asbestos contamination due solely to asbestos in source water shall, one sample must be collected at the entry point to the distribution system after any treatment.¶

(E) A system 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.¶

(F) If a sample result exceeds the MCL for asbestos as prescribed in subsection (2)(h) of this rule, the water supplier shall monitor quarterly beginning in the next quarter after the violation occurred. If the Authority determines that the sample results are reliably and consistently below the MCL based on a minimum of two quarterly samples for groundwater systems or a minimum of four quarterly samples for water systems using surface water sources, the monitoring may be returned to the frequency prescribed in paragraph (2)(b)(A) of this rule.¶

(c) Nitrate:¶

(A) At community and NTNC water systems using surface water or GWUDI sources, water suppliers must monitor ~~N~~nitrate every calendar quarter at each point in the distribution system representative of each source after treatment or at entry points to the distribution system after any application of treatment. The Authority may allow a water supplier to reduce the sampling frequency to annually provided that all analytical results from four consecutive quarters are less than 50 percent of the MCL. At surface water systems, monitoring shall return to quarterly if nitrate in any one sample is 50 percent of the MCL or greater.¶

(B) At community and NTNC water systems using groundwater sources, water suppliers must monitor nitrate annually at each point in the distribution system representative of each source after treatment or at entry points to the distribution system after any application of treatment. The Authority shall require quarterly monitoring for a least one year following any one sample in which the concentration of nitrate is 50 percent of the MCL or greater. Monitoring may return to annual after four consecutive quarterly samples are found to be reliably and consistently below the MCL.¶

(C) At TNC and state regulated water systems, water suppliers must monitor nitrate annually at each point in the distribution system representative of each source after treatment or at entry points to the distribution system

after any application of treatment. At TNC water systems, water suppliers must monitor quarterly for at least one year following any one sample in which the concentration of nitrate is 50 percent of the MCL or greater. Monitoring may return to annual after four consecutive quarterly samples are found to be reliably and consistently below the MCL.¶

(D) After the initial round of quarterly sampling is completed at community and NTNC water systems where monitoring is annually, water suppliers must collect subsequent samples during the quarter(s) which previously resulted in the highest analytical result.¶

(d) Nitrite:¶

(A) At community, NTNC, and TNC water systems, water suppliers must collect one sample for nitrite at each point in the distribution system representative of each source after treatment or at entry points to the distribution system after any application of treatment.¶

(B) After the initial sample, at systems where analytical results for nitrite are <50 percent of the MCL, water suppliers must monitor once during each subsequent compliance period.¶

(C) Water suppliers must monitor every quarter for at least one year following any one sample in which the concentration is e50 percent of the MCL. A water system may change to annual monitoring after four consecutive quarterly samples are found to be reliably and consistently below 50 percent of the MCL.¶

(D) At water systems where an analytical result e50 percent of the MCL, water suppliers may never monitor less frequently than annually. At systems where monitoring is annually, water suppliers must collect each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.¶

(E) The Authority may grant a waiver from the monitoring frequency specified in paragraph (2)(d)(B) of this rule provided that water systems have conducted a minimum of three rounds of monitoring (at least one sample shall have been collected since January 1, 1993), and all analytical results are less than 50 percent of the MCL prescribed in OAR 333-061-0030. At water systems that have been granted a waiver, water suppliers must monitor once during each nine-year compliance cycle. Waivers must be granted as prescribed by subparagraph (2)(a)(C)(ii) of this rule.¶

(F) At water systems with two or more wells that have been determined to constitute a wellfield as specified in subsection (1)(k) of this rule, the Authority may approve monitoring at those entry point(s) determined to represent water quality throughout the wellfield.¶

(e) Sodium:¶

(A) Samples of water which is delivered to users shall be analyzed for sodium as follows:¶

(i) At community and NTNC water systems using surface water or GWUDI sources, water suppliers must monitor once per year for each source.¶

(ii) At community and NTNC water systems using groundwater sources, water suppliers must monitor once every three years for each source.¶

(B) The water supplier shall report to the Authority the results of the analyses for sodium as prescribed in OAR 333-061-0040. The Authority shall notify local health officials of the test results.¶

(f) Confirmation Samples:¶

(A) Where the results of sampling for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium exceed the MCL prescribed in OAR 333-061-0030 for inorganic chemicals, the Authority may require one additional sample to be collected as soon as possible after the initial sample was collected (but not to exceed two weeks) at the same sampling point.¶

(B) Where the results of sampling for nitrate or nitrite exceed the MCL prescribed in OAR 333-061-0030 for inorganic chemicals, water suppliers must collect one additional sample within 24 hours of notification of the results of the initial sample at the same sampling point. Water suppliers unable to comply with the 24-hr sampling requirement must initiate consultation with the Authority as soon as practical, but no later than 24 hours after learning of the violation and must immediately notify their users as prescribed in OAR 333-061-0042(2)(a)(B), and collect one additional sample within two weeks of notification of the results of the initial sample.¶

(C) If a confirmation sample required by the Authority is collected for any contaminant, the results of the initial and confirmation sample shall be averaged. The resultant average shall be used to determine the system's compliance as prescribed in subsection (2)(h) of this rule.¶

(g) The Authority may require more frequent monitoring than specified in subsections (2)(a) through (f) of this rule or may require confirmation samples for positive and negative results. Systems may apply to the Authority to conduct more frequent monitoring than is required in this section.¶

(h) Compliance with the inorganic MCLs as listed in OAR 333-061-0030(1) (Table 1) shall be determined based on the analytical result(s) obtained at each sampling point as follows:¶

(A) For water systems where the monitoring frequency is greater than annual, compliance with the MCLs for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium is determined by a running annual average (RAA) at any sampling point. If the average of sample results at any sampling point rounded to the same number of significant figures as the MCL for the substance in question is

greater than the MCL, then the water system is out of compliance. If any single sample result would cause the annual average to be exceeded, then the system is out of compliance immediately. Any sample with results below the detection limit specified for the approved EPA analytical method shall be calculated at zero for the purpose of determining the annual average. If a water supplier fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.¶

(B) At water systems where monitoring is annual or less frequent for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium, water suppliers must begin quarterly sampling if the level of a contaminant at any sampling point is greater than the MCL listed in OAR 333-061-0030(1). The water supplier must then determine compliance with the MCL by RAA at the sampling point. The water system will not be considered in violation of the MCL until one year of quarterly monitoring is completed. If any sample result will cause the RAA to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately. If a water supplier fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.¶

(C) Compliance with MCLs for nitrate and nitrite is determined based on one sample if the levels of these contaminants are below the MCLs. If the levels of nitrate or nitrite exceed the MCLs in the initial sample, a confirmation sample is required in accordance with paragraph (2)(f)(B) of this rule and compliance shall be determined based on the average of the initial and confirmation samples.¶

(D) If the results of an analysis as prescribed in this rule indicate the level of any contaminant exceeds the MCL, the water supplier shall report the analysis results to the Authority within 48 hours as prescribed in OAR 333-061-0040 and initiate the public notice procedures as prescribed by OAR 333-061-0042.¶

(E) A water system's RAA is calculated by averaging the analytical results for the current monitoring period and the previous monitoring periods within a one-year time frame. For water systems where monitoring is less frequently than quarterly, the first sample result that exceeds the MCL is considered to be the initial sample result for determination of the RAA. Multiple sample results within any monitoring period will be averaged and then rounded to the same number of significant figures as the MCL of the contaminant in question. For the purposes of calculating a RAA, a monitoring period may be a calendar month or calendar quarter. ~~Special samples, as described by paragraph (1)(h)¶~~

(F) At water systems where POU treatment is approved to reduce concentrations of a chemical listed in subsection (2)(c) of this rule, will not be included in the calculation of a system's RAA compliance with the MCL for the water system is determined by RAA for each treatment device.¶

(3) Organic chemicals:¶

(a) At community and NTNC water systems, water suppliers must monitor according to this section for the following regulated synthetic organic chemicals (SOC): ~~A~~alachlor, ~~A~~trazine, ~~B~~benzo(a)pyrene, ~~C~~carbofuran, ~~C~~hlordane, ~~D~~dalapon, ~~D~~ibromochloropropane, ~~D~~inoseb, ~~D~~ioxin(2,3,7,8-TCDD), ~~D~~iquat, ~~D~~i(2-ethylhexyl)adipate, ~~D~~i(2-ethylhexyl)phthalate, ~~E~~ndothall, ~~E~~ndrin, ~~E~~thylene dibromide, ~~G~~lyphosate, ~~H~~eptachlor, ~~H~~eptachlor epoxide, ~~H~~exachlorobenzene, ~~H~~exachlorocyclopentadiene, ~~L~~indane(BHC-g), ~~M~~ethoxychlor, ~~O~~xamyl(Vydate), ~~P~~picloram, ~~P~~polychlorinated biphenyls, ~~P~~entachlorophenol, ~~S~~imazine, ~~T~~oxaphene, 2,4-D and 2,4,5-TP ~~S~~ilvex.¶

(A) Initial sampling.¶

(i) At sampling points served by surface water or GWUDI sources, samples must be collected at each point in the distribution system representative of each source after treatment or at entry points to the distribution system after any application of treatment. At least four consecutive quarterly samples must be collected at each sampling point during each compliance period. Samples must be collected from the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.¶

(ii) At sampling points served by groundwater sources only, samples must be collected at every entry point to the distribution system after any application of treatment. Samples must be collected annually for three consecutive years at each sampling point during each compliance period. Samples must be collected from the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. New wells in an existing wellfield, within an existing DWPA, or within an area well characterized by area-wide source water assessments or past monitoring results as determined by the Authority, may be eligible for a reduction in initial monitoring from three consecutive annual samples to one sample if no detections occur and if, based on the system's source water assessment, the Authority determines that the new well is producing from the same and only the same aquifer or does not significantly modify the existing DWPA.¶

(iii) If a system draws water from more than one source and sources are combined before distribution, samples must be collected at an entry point to the distribution system during periods of normal operating conditions when water is representative of all the sources being used.¶

(iv) At water systems with two or more wells that have been determined to constitute a wellfield as specified in subsection (1)(k) of this rule, sampling may be reduced to only those entry points designated by the Authority.¶

(B) If the initial analyses as specified in subparagraphs (3)(a)(A)(i) or (ii) of this rule does not detect any



contaminant listed in subsection (3)(a) of this rule, then monitoring at each sampling point should be conducted as follows:¶

(i) At water systems serving more than 3,300 people, two quarterly samples in the same calendar year during each repeat 3-year compliance period; or¶

(ii) At systems serving 3,300 people or less, one sample in each repeat 3-year compliance period.¶

(C) Water suppliers may apply to the Authority for a waiver from the monitoring frequencies specified in subparagraphs (3)(a)(A)(i) or (ii) or paragraph (3)(a)(B) of this rule. If the Authority determines there was no previous use of a contaminant within a watershed or zone of influence, a waiver may be granted. If the Authority determines that a contaminant was used previously or the use of a contaminant is unknown then the factors specified in subparagraph (3)(a)(C)(iii) of this rule shall determine whether a waiver is granted. A waiver must be in place prior to the year in which the monitoring is to be conducted. Water suppliers must reapply for a waiver for each compliance period. Regardless of waiver status, monitoring must occur at the minimum frequencies specified in subparagraph (3)(a)(C)(v) or (vi) of this rule.¶

(i) The DWPA delineated during the source water assessment must be used according to Authority procedures and guidance.¶

(ii) For waivers based on the use of a contaminant, the criteria considered by the Authority includes but is not limited to the use, storage, distribution, transport and disposal of the contaminant within the delineated recharge or watershed area.¶

(iii) For waivers based on susceptibility to contamination, the criteria considered by the Authority includes but is not limited to the history of bacteria or nitrate contamination, well construction, agricultural management practices, infiltration potential, contaminant mobility and persistence, previous analytical results, the proximity of the system to a potential point or non-point source of contamination, and use of PCBs in equipment used in the production, distribution, or storage of water.¶

(iv) The Authority may establish area-wide waivers based on historical monitoring data, land use activity, and the results of source water assessments or waivers based on use or susceptibility.¶

(v) Monitoring must be conducted at least once every six years for all SOCs if an Authority approved drinking water protection plan exists for the water system.¶

(vi) Monitoring must be conducted at least once every nine years for those SOCs not used within the DWPA if no Authority approved drinking water protection plan exists for a water system. Monitoring must be conducted at least once every six years or once every nine years as determined by the Authority, for those SOCs used within the DWPA based upon SOC chemical characteristics, aquifer characteristics and well construction.¶

(D) If a contaminant listed in subsection (3)(a) of this rule is detected at a water system equal to or greater than the minimum detection limit listed in Table 15, then the water supplier shall monitor quarterly at each sampling point where a detection occurred. If a contaminant is detected at a concentration greater than the MCL, monitoring must be conducted as prescribed by paragraph (3)(a)(E) of this rule.¶

(i) The Authority may reduce the monitoring frequency required by paragraph (3)(a)(D) of this rule to annually if at least two quarterly samples for groundwater sources or four quarterly samples for surface water sources are reliably and consistently below the MCL. Annual monitoring according to this subparagraph must be conducted during the quarter that previously yielded the highest analytical result.¶

(ii) At systems where three consecutive annual samples are collected with no detection of a contaminant, water suppliers may apply to the Authority for a waiver. Monitoring may not be reduced to less often than annually except upon receipt of a waiver granted by the Authority.¶

(iii) If monitoring required by paragraphs (3)(a)(A) through (D) of this rule results in the detection of either H<sub>7</sub>heptachlor or H<sub>7</sub>heptachlor epoxide, then subsequent monitoring shall analyze for both contaminants.¶

(E) If a contaminant listed in subsection (3)(a) of this rule is detected at a concentration greater than the MCL, then the water supplier must monitor quarterly. After a minimum of four quarterly samples, if results are reliably and consistently below the MCL and in compliance with paragraph (3)(a)(H) of this rule, then the water supplier may monitor annually.¶

(F) The Authority may require confirmation samples for positive or negative results. If a confirmation sample is required by the Authority, the result must be averaged with the original sample result (unless the previous sample has been invalidated by the Authority) and the average used to determine compliance.¶

(G) The Authority may allow compositing of samples to reduce the number of samples to be analyzed at a water system. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be conducted in the laboratory and analyzed within 14 days of sample collections. If the concentration in the composite sample detects one or more contaminants listed in subsection (3)(a) of this rule, then a follow-up sample must be collected and analyzed within 14 days at each sampling point included in the composite, and be analyzed for that contaminant. Duplicates collected for the original composite samples may be used instead of re-sampling provided the duplicates are analyzed and the results reported to the Authority within 14 days of collection. For water

systems serving more than 3,300 people, the Authority may allow compositing at sampling points only within a single system. For systems serving 3,300 people or less, the Authority may allow compositing among different systems, provided the 5-sample limit is maintained.¶

(H) Compliance with the MCL for contaminants listed in OAR 333-061-0030(2)(a) shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the water system is in violation of the MCL. At water systems where monitoring is more than once per year, compliance with the MCL is determined by a running annual average (RAA) at each sampling point. At systems where annual or less frequent monitoring takes place, if sample results exceed the regulatory detection limit prescribed in paragraph (3)(a)(D) of this rule (Table 15), monitoring must be increased to quarterly. A water system will not be considered in violation of the MCL until one year of quarterly monitoring is completed. If any single sample result will cause the RAA to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately. If a water supplier fails to collect the required number of samples, compliance will be based on the total number of samples collected. If a sample result is less than the detection limit, zero will be used to calculate the annual average. If the system is out of compliance, the system shall follow the reporting and public notification procedures as prescribed in OAR 333-061-0040 and 333-061-0042(2)(b)(A).¶

(I) The RAA for a contaminant is calculated by averaging the analytical results for the current monitoring period and the previous monitoring periods within a one-year time frame. For water systems where monitoring is less frequent than quarterly, the first sample result that exceeds the detection limit or MCL is considered to be the initial sampling result for determination of the RAA. Multiple sample results within any monitoring period will be averaged and then rounded to the same number of significant figures as the MCL for the contaminant in question. For the purposes of calculating a RAA, a monitoring period may be a calendar month or calendar quarter. Special samples, as described by paragraph (1)(h)(C) of this rule, will not be included in the calculation of the RAA at a water system.¶

(J) At new water systems or systems where a new source of water is added, water suppliers must demonstrate compliance with the MCL within a period of time specified by the Authority. The water supplier must also comply with the initial sampling frequencies specified by the Authority to demonstrate compliance with the MCL.¶

(b) Water suppliers responsible for community and NTNC water systems must conduct monitoring according to this section for the following regulated volatile organic chemicals (VOCs): Benzene, Carbon tetrachloride, cis-1,2-Dichloroethylene, Dichloromethane, Ethylbenzene, Monochlorobenzene, o-Dichlorobenzene, p-Dichlorobenzene, Styrene, Tetrachloroethylene (PCE), Toluene, trans-1,2-Dichloroethylene, Trichloroethylene (TCE), Vinyl chloride, Xylenes (total), 1,1-Dichloroethylene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, 1,2-Dichloroethane, 1,2-Dichloropropane, and 1,2,4-Trichlorobenzene.¶

(A) Initial monitoring:¶

(i) At sampling points served by surface water or GWUDI sources, samples must be collected at each point in the distribution system representative of each source after treatment or at entry points to the distribution system after any application of treatment. At least four consecutive quarterly samples must be collected at each sampling point during each compliance period. Samples must be collected from the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.¶

(ii) At sampling points served by groundwater sources only, samples must be collected at every entry point to the distribution system after any application of treatment. Samples must be collected annually for three consecutive years at each sampling point during each compliance period. Samples must be collected from the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. New wells in an existing wellfield, within an existing DWPA, or within an area well characterized by area-wide source water assessments or past monitoring results as determined by the Authority, may be eligible for a reduction in initial monitoring from three consecutive annual samples to one sample if no detections occur and if, based on the system's source water assessment, the Authority determines that the new well is producing from the same and only the same aquifer or does not significantly modify the existing DWPA.¶

(iii) The Authority may designate additional sampling points within the distribution system or at the consumer's tap which more accurately determines consumer exposure to VOCs.¶

(iv) If a water system draws water from more than one source and the sources are combined before distribution, the samples must be collected at entry points to the distribution system during periods of normal operating conditions when water is representative of all sources being used.¶

(v) A water system with two or more wells that have been determined to constitute a wellfield as specified in subsection (1)(k) of this rule may reduce sampling to only those entry point(s) designated by the Authority.¶

(B) If the initial analyses conducted according to subparagraphs (3)(b)(A)(i) or (ii) of this rule do not detect any contaminant listed in subsection (3)(b) of this rule, then monitoring for all of the VOCs should be conducted as follows:¶

(i) For sampling points served by surface water or GWUDI sources, one sample every year per entry point; or¶

(ii) For sampling points served only by groundwater sources, one sample every three years per entry point.¶

(C) Water suppliers may apply to the Authority for a waiver from the monitoring frequencies specified in paragraph (3)(b)(B) of this rule. Waivers will be granted according to the criteria and procedures specified in subparagraphs (3)(a)(C)(i) through (vi) of this rule if the Authority determines there were no detections of any contaminant listed in subsection (3)(b) of this rule and if an Authority approved drinking water protection plan exists for the water system or for those VOCs used within a portion of the DWPA that the Authority has determined is not susceptible to VOC contamination.¶

(i) Waivers granted for monitoring at groundwater systems shall be effective for no more than six years.¶

(I) Waivers must be in place prior to the year in which monitoring is to be conducted, and water suppliers must reapply for a waiver from VOC monitoring every two compliance periods (six years).¶

(II) As a condition of a waiver, water suppliers must collect one sample at each sampling point during the time the waiver is in effect and update the vulnerability assessment for the water system addressing those factors listed in subparagraphs (3)(a)(C)(ii) and (iii) of this rule. The Authority must be able to confirm that a system is not susceptible within three years of the original determination, and every time the vulnerability assessment is updated, or the waiver is invalidated and monitoring must be conducted as specified in paragraph (3)(b)(B) of this rule.¶

(ii) At water systems using surface water that have been determined not to be vulnerable to VOC contamination by the Authority, monitoring must be conducted at the frequency prescribed by the Authority. Water suppliers must update the vulnerability assessment for such water systems during each compliance period and submit the vulnerability assessment to the Authority regardless of the frequency of monitoring.¶

(iii) The Authority may establish area-wide waivers based on historical monitoring data, land use activity, the results of source water assessments or waivers granted for use of VOCs or susceptibility to VOC contamination.¶

(D) If a contaminant listed in subsection (3)(b) of this rule (except vinyl chloride) is detected in any sample at a concentration greater than the minimum detection limit of 0.0005 mg/l, then the water supplier shall monitor quarterly at each sampling point where a detection occurred except as provided in subparagraph (3)(b)(D)(i) of this rule.¶

(i) The Authority may reduce the monitoring frequency specified in this paragraph to annually if results for the water system are reliably and consistently below the MCL for at least two quarters for sample points served only by groundwater sources and four quarters for sample points served by surface water or GWUDI sources.¶

(I) For annual monitoring, samples must be collected during the quarter that previously yielded the highest analytical result.¶

(II) If a contaminant is detected at a concentration greater than 0.0005 mg/l but below the MCL in one of the annual samples as prescribed by subparagraph (3)(b)(D)(i) of this rule, the water supplier must monitor at the frequency specified by the Authority but in no case less frequently than annually.¶

(ii) At water systems or sampling points where three consecutive annual samples are collected with no detection of a contaminant, water suppliers may apply to the Authority for a waiver. Monitoring may not be reduced to less often than annually except upon by a waiver granted by the Authority.¶

(iii) At water systems using groundwater sources where one or more of the following two-carbon organic compounds was detected: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene or 1,1-dichloroethylene, the water supplier shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be collected 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 Authority may reduce the quarterly monitoring frequency of vinyl chloride monitoring to one sample during each compliance period. Water suppliers responsible for surface water systems are required to monitor for vinyl chloride at the discretion of the Authority.¶

(E) If a contaminant listed in subsection (3)(b) of this rule is detected at a concentration greater than the MCL, then the water supplier must monitor quarterly. After a minimum of four consecutive quarterly samples, if results are reliably and consistently below the MCL and in compliance with paragraph (3)(b)(H) of this rule, then the water supplier may monitor annually. Annual samples must be collected during the quarter which previously yielded the highest analytical result.¶

(F) The Authority may require confirmation samples for positive or negative results. If a confirmation sample is required by the Authority, the result must be averaged with the original sample result and the average used to determine compliance.¶

(G) The Authority may allow compositing of samples to reduce the number of samples to be analyzed by the system. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be conducted in the laboratory and samples must be analyzed within 14 days of sample collections. If the concentration in the composite sample is 0.0005 mg/l or greater for any contaminant listed in subsection (3)(b) of this rule, then a follow-up sample must be collected and analyzed within 14 days at each sampling point included in the composite, and be analyzed for that contaminant. Duplicates collected for the original composite samples may be used

instead of resampling provided the duplicates are analyzed and the results reported to the Authority within 14 days of collection. For water systems serving a population greater than 3,300 people, the Authority may allow compositing at sampling points only within a single water system. For water systems serving population of 3,300 people or less, the Authority may allow compositing among different water systems provided the 5-sample limit is maintained.¶

(H) Compliance with contaminants listed in OAR 333-061-0030(2)(c) shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the water system is in violation of the MCL. For systems where monitoring is more than once per year, compliance with the MCL is determined by a running annual average (RAA) at each sampling point. At systems where annual or less frequent monitoring takes place, if sample results exceed the MCL, monitoring must be increased to quarterly. The system will not be considered in violation of the MCL until at least one year of quarterly sampling is completed. If any single sample result will cause the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately. If a water supplier fails to collect the required number of samples, compliance will be based on the total number of samples collected. If a sample result is less than the detection limit, zero will be used to calculate the annual average. If the water system is out of compliance, the water supplier shall follow the reporting and public notification procedures as prescribed in 333-061-0040 and 333-061-0042(2)(b)(A).¶

(I) The RAA for a contaminant is calculated by averaging the analytical results for the current monitoring period and the previous monitoring periods within a one-year time frame. For water systems where monitoring is less frequent than quarterly, the first sample result that exceeds the detection limit or MCL is considered to be the initial sampling result for determination of the RAA. Multiple sample results within any monitoring period will be averaged and then rounded to the same number of significant figures as the MCL for the contaminant in question. For the purposes of calculating a RAA, a monitoring period may be a calendar month or calendar quarter. Special samples, as described by paragraph (1)(h)(C) of this rule, will not be included in the calculation of the running annual average at a water system.¶

(J) At new water systems or water systems using a new source of water, water suppliers must demonstrate compliance with the MCL within a period of time specified by the Authority. The water supplier must also comply with the initial sampling frequencies specified by the Authority to demonstrate compliance with the MCL.¶

(4) Disinfectant Residuals, Disinfection Byproducts, and Disinfection Byproduct Precursors.¶

(a) General sampling and analytical requirements. The requirements of this section apply to all community and NTNC water systems where a disinfectant (oxidant) is added to the water supply at any point in the treatment process or deliver water in which a disinfectant (oxidant) has been added to the water supply except that compliance with paragraph (4)(i)(B) is required at TNCs where chlorine dioxide is used as a disinfectant or oxidant.¶

(A) Water suppliers must collect all samples during normal operating conditions.¶

(B) Failure to monitor in accordance with the monitoring plan as specified in paragraph (4)(c)(B) of this rule is a monitoring violation.¶

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

(D) Water suppliers may use only data collected under the provisions of this rule to qualify for reduced monitoring.¶

(E) All samples collected and analyzed under the provisions of section (4) of this rule must be included in determining compliance, even if that number is greater than the minimum required.¶

(b) Initial Distribution System Evaluation (IDSE) Requirements. This subsection establishes monitoring and other requirements for identifying monitoring locations which, in conjunction with the requirements of subsections (4)(c) and (4)(d) of this rule, determine compliance with the MCLs for TTHM and HAA5 as specified in OAR 333-061-0030. Water suppliers for NTNC water systems serving less than 10,000 people are exempt from the requirements of this subsection.¶

(A) Water suppliers that begin adding a disinfectant to a water system must complete an IDSE by conducting either standard monitoring or a system specific study. Water suppliers must consult with the Authority after completing the IDSE to identify compliance monitoring locations prior to developing a monitoring plan as prescribed in paragraph (4)(c)(B) of this rule that includes monitoring locations identified through the IDSE process. Samples collected to conduct an IDSE will not be used for the purpose of determining compliance with MCLs as prescribed by OAR 333-061-0030(2)(b).¶

(B) Standard monitoring.¶

(i) Standard monitoring plans must include the elements specified in sub-subparagraphs (4)(b)(B)(i)(I) through (III) of this rule:¶

(I) A schematic of the distribution system (including distribution system water sources, entry points, and storage

facilities), with notes indicating the locations and dates of all projected standard monitoring;¶

(II) An explanation of standard monitoring location selection, and a summary of data relied on to justify the selection; and¶

(III) The population served and source water classification for the water system.¶

(ii) Water suppliers must monitor as indicated in Table 16 below. Water suppliers must collect dual sample sets at each monitoring location, and at least one round of monitoring must be conducted during the peak historical month for TTHM or HAA5 levels, or during the month of warmest water temperature. Water suppliers must review available compliance, study, or operational data to determine the peak historical month for TTHM or HAA5 levels or the month of warmest water temperature.¶

(iii) Samples must be collected at locations spread throughout the distribution system.¶

(iv) If the number of entry points to the distribution system is fewer than the number of entry point monitoring locations specified in Table 16, excess entry point samples must be replaced equally by samples collected at locations where you would expect to find high TTHM and HAA5 concentration. If there is an odd number of excess sampling locations, the additional sample must be collected at a location where you would expect to find high TTHM concentration. If the number of entry points to the distribution system is greater than the number of entry point monitoring locations specified in Table 16, the samples must be collected at entry points having the highest annual water flows.¶

(v) Monitoring in accordance with Table 16 may not be reduced according to the provisions of subsection (1)(d) of this rule.¶

(vi) IDSE report. Water suppliers must submit an IDSE report to the Authority within 90 days of completing standard monitoring that includes the following elements:¶

(I) All TTHM and HAA5 analytical results collected according to this rule, and all standard monitoring analytical results collected during the period of the IDSE as individual analytical results and a LRAA presented in a format acceptable to the Authority. If changed from the standard monitoring plan prescribed by subparagraph (4)(b)(B)(i) of this rule, the report must also include a schematic of the distribution system, the population served, and the source water type.¶

(II) An explanation of any deviations from the approved standard monitoring plan.¶

(III) Recommended times and locations for the compliance monitoring required by subsections (4)(c) and (4)(d) of this rule, based on the protocol prescribed by subparagraph (4)(b)(D)(iii) of this rule, including an explanation for why the locations were selected.¶

(C) System Specific Study. A system specific study must be based on modeling as prescribed by subparagraph (4)(b)(C)(i) of this rule.¶

(i) Modeling. Water suppliers may conduct analysis of an extended period simulation hydraulic model. The hydraulic model and analysis must meet the following criteria:¶

(I) The model must simulate a 24-hour variation in demand and show a consistently repeating 24-hour pattern of residence time;¶

(II) The model must represent the following criteria: (1) 75 percent of pipe volume; (2) 50 percent of pipe length; (3) all pressure zones; (4) all 12-inch diameter and larger pipes; (5) all 8-inch and larger pipes that connect pressure zones, influence zones from different sources, storage facilities, major demand areas, pumps, and control valves, or are known or expected to be significant conveyors of water; (6) all 6-inch and larger pipes that connect remote areas of a distribution system to the main portion of the system; (7) all storage facilities with standard operations represented in the model; and (8) all active pump stations with controls represented in the model; and (9) all active control valves; and¶

(III) The model must be calibrated, or have calibration plans for the current configuration of the distribution system during the period of highest TTHM formation potential. All storage facilities must be evaluated as part of the calibration process. Calibration must be completed no later than 12-months after submission of the system specific study plan.¶

(IV) Reporting modeling. The system specific study plan must include: (1) tabular or spreadsheet data demonstrating that the model meets requirements in sub-subparagraph (C)(i)(II) of this section; (2) a description of all calibration activities undertaken, and if calibration is complete, a graph of predicted tank levels versus measured tank levels for the storage facility with the highest residence time in each pressure zone, and a time series graph of the residence time at the longest residence time storage facility in the distribution system showing the predictions for the entire simulation period (that is, from time zero until the time it takes to for the model to reach a consistently repeating pattern of residence time); (3) model output showing preliminary 24 hour average residence time predictions throughout the distribution system; (4) timing and number of samples representative of the distribution system planned for at least one monitoring period of TTHM and HAA5 dual sample monitoring at a number of locations no less than would be required for the system under standard monitoring in paragraph (4)(b)(B) of this rule during the historical month of high TTHM; (5) description of how all requirements will be completed no later than 12 months after system submits the system specific study plan; (6) schematic of the

distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating the locations and dates of all completed system specific study monitoring (if calibration is complete) and all compliance monitoring conducted in accordance with this rule; and (7) population served and system type (surface water, groundwater under the direct influence of surface water, or groundwater).¶

(V) If a model is submitted that does not meet the requirements of subparagraph (4)(b)(C)(i) of this rule, the system must correct the deficiencies and respond to Authority inquiries concerning the model. Failure to correct deficiencies or respond to inquiries by the Authority will result in the system having to conduct standard monitoring as prescribed by paragraph (4)(b)(B) of this rule.¶

(ii) IDSE report. Water suppliers must submit the IDSE report to the Authority within 90 days of completing the system specific study, and the report must include the following elements:¶

(I) The IDSE report must include all system specific study monitoring results collected during the period of the system specific study submitted in a tabular or spreadsheet format acceptable to the Authority. If changed from the system specific study plan submitted under paragraph (4)(b)(C) of this rule, the IDSE report must also include a schematic of the distribution system, the population served, and source water classification;¶

(II) If using the modeling provision prescribed by subparagraph (4)(b)(C)(i) of this rule, the water supplier must include final information for the elements described in sub-subparagraphs (4)(b)(C)(i)(IV) and (V) of this rule, and a 24-hour time series graph of residence time for each location selected for monitoring in accordance with subsections (4)(c) and (4)(d) of this rule;¶

(III) The water supplier must recommend monitoring locations selected for monitoring in accordance with subsections (4)(c) and (4)(d) of this rule based on the protocol in paragraph (4)(b)(D) of this rule. It must also recommend and justify the timing of the monitoring to be conducted at these monitoring locations.¶

(IV) The IDSE report must include an explanation of any deviations from the approved system specific study plan.¶

(V) The IDSE report must include the analytical and modeling results, and the justification for recommending the monitoring locations selected for monitoring in accordance with subsections (4)(c) and (4)(d) of this rule.¶

(D) Monitoring location recommendations.¶

(i) The IDSE report must include recommendations and explanation for where and during what month(s) TTHM and HAA5 monitoring in accordance with subsections (4)(c) and (4)(d) of this rule should be conducted. Recommendations must be based on the criteria in subparagraphs (4)(b)(D)(ii) through (v) of this rule.¶

(ii) Water suppliers must collect samples as prescribed by Table 17 below. The number of samples and recommended locations must be used for monitoring in accordance with subsections (4)(c) and (4)(d) of this rule, unless the Authority requires different or additional locations. Monitoring locations should be dispersed throughout the distribution system to the maximum extent possible.¶

(iii) Water suppliers must recommend locations for monitoring in accordance with subsections (4)(c) and (4)(d) of this rule based on standard monitoring results or system specific study results. Water suppliers must comply with the protocol specified in sub-subparagraphs (4)(b)(D)(iii)(I) through (VI) of this rule. If a water system is required to monitor at more than six locations, the protocol must be repeated as necessary. Water systems must select the:¶

(I) Location with the highest TTHM LRAA not previously selected through this protocol;¶

(II) Location with the highest HAA5 LRAA not previously selected through this protocol;¶

(III) Location with the highest TTHM LRAA not previously selected through this protocol;¶

(IV) Location with the highest TTHM LRAA not previously selected through this protocol;¶

(V) Location with the highest HAA5 LRAA not previously selected through this protocol; and¶

(VI) Location with the highest HAA5 LRAA not previously selected through this protocol.¶

(iv) A water supplier may recommend locations other than those determined through subparagraph (4)(b)(D)(iii) of this rule, if the system includes a rationale for selecting other locations. If the Authority approves the alternate locations, the water system must monitor at these locations to determine compliance with subsections (4)(c) and (4)(d) of this rule.¶

(v) The water system's recommended monitoring schedule must include the month of historically highest TTHM and HAA5 concentration, unless the Authority approves another month. Once the highest historical month has been identified, and if quarterly or more frequent routine monitoring is required, water systems must schedule monitoring at a regular frequency of at least every 90 days.¶

(c) Monitoring requirements for TTHM and HAA5:¶

(A) Routine Monitoring Frequency. At water systems for which an IDSE report was submitted, samples must be collected at the locations and during the months recommended in the IDSE report as prescribed by paragraph (4)(b)(D) of this rule, unless the Authority requires other or additional locations after its review. At NTNC water systems serving less than 10,000 people and for water systems granted a waiver by the EPA exempting the water supplier from completing an IDSE, samples must be collected at the location(s) and dates identified in the monitoring plan developed as prescribed in paragraph (4)(c)(B) of this rule. Samples must be collected at no fewer than the number of locations identified in Table 18.¶

(B) A monitoring plan must be developed for every water system where monitoring is required according to this

subsection, and must be maintained and made available for inspection by the Authority and the general public.¶

(i) The monitoring plan must include the following elements:¶

(I) Monitoring locations;¶

(II) Monitoring dates; and¶

(III) Compliance calculation procedures.¶

(ii) For water systems where an IDSE report was not required as prescribed in paragraphs (4)(b)(B) or (4)(b)(C) of this rule the monitoring plan must identify the required number of monitoring locations for monitoring in accordance with subsections (4)(c) and (4)(d) of this rule. Water suppliers must identify the locations by alternating the selection of locations representing high TTHM levels and high HAA5 levels until the required number of monitoring locations have been identified. Water suppliers must also provide a rationale for identifying the locations as having high levels of TTHM or HAA5.¶

(iii) For water systems using surface water or GWUDI sources serving more than 3,300 people, a copy of the monitoring plan must be submitted to the Authority prior to the date the water supplier conducts initial monitoring according to this subsection, unless the IDSE report submitted as prescribed in subsection (4)(b) of this rule contains all the information required in paragraph (4)(c)(B) of this rule.¶

(iv) Revisions to monitoring plans. Water suppliers may revise monitoring plans to reflect changes in treatment, distribution system operations, layout (including new service areas), or other factors that may affect TTHM or HAA5 formation, including Authority-approved reasons, after consultation with the Authority regarding the need and justification for the revision. If monitoring locations are changed, then water systems must replace existing monitoring locations with the lowest LRAA with new locations that reflect current distribution system locations expected to have high TTHM or HAA5 levels. The Authority may require modifications in monitoring plans. Surface water or groundwater under the direct influence of surface water systems serving > 3,300 people must submit a copy of their modified monitoring plan to the Authority prior to the date required to comply with the revised monitoring plan.¶

(C) A water system monitoring for TTHM or HAA5 in accordance with subsections (4)(c), (4)(d) or (4)(e) of this rule is in violation of the MCL specified in OAR 333-061-0030(2)(b) when the LRAA calculation at any monitoring location exceeds the MCL based on four consecutive quarters of monitoring (or fewer than four quarters of monitoring if the MCL would be exceeded regardless of monitoring results in subsequent quarters). A water system is in violation of the monitoring requirements every quarter that a monitoring result would be used in calculating an LRAA if the system fails to monitor.¶

(D) Compliance calculations and determinations. For water systems where quarterly monitoring is required, water suppliers must make compliance calculations at the end of every calendar quarter beginning with the fourth quarter of the initial monitoring period. The LRAA must be calculated prior to the fourth quarter if fewer than four quarters of data would cause the MCL to be exceeded, regardless of the monitoring results in subsequent quarters. Water suppliers required to conduct monitoring at a frequency less than quarterly must make compliance calculations every time samples are collected.¶

(i) Water suppliers must calculate the LRAA for TTHM and HAA5 to determine that each LRAA does not exceed the MCL listed in OAR 333-061-0030(2)(b) for water systems where quarterly monitoring is required. Water suppliers that fail to complete four consecutive quarters of monitoring must calculate the LRAA based on the available data from the most recent four quarters. Water suppliers that collect more than one sample per quarter at a specific monitoring location must average all samples collected in the quarter for that location to determine a quarterly average to be used in the LRAA calculation.¶

(ii) For water systems where monitoring is yearly or less frequent, water suppliers must determine that each sample collected is less than the MCL listed in OAR 333-061-0030(2)(b). If any sample exceeds the MCL, the water system must comply with the requirements of subsection (4)(e) of this rule. If no sample exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location.¶

(iii) A water supplier required to conduct quarterly monitoring at a water system is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if monitor is not conducted.¶

(d) Reduced monitoring. Water suppliers may reduce monitoring to the frequency specified in Table 19 any time the LRAA is  $\leq 0.040$  mg/L for TTHM and  $\leq 0.030$  mg/L for HAA5 at all monitoring locations.¶

(A) Water suppliers may only use data collected under the provisions of subsections (4)(c) and (4)(d) of this rule to qualify for reduced monitoring. In addition, the annual source water average TOC level, before any treatment, must be less than or equal to 4.0 mg/L at each plant treating surface water or groundwater under the direct influence of surface water, based on monitoring conducted as prescribed in paragraph (4)(d)(D) and subsection (4)(k) of this rule.¶

(B) Water suppliers may remain on reduced monitoring so long as:¶

(i) The LRAA for water systems conducting quarterly monitoring is less than or equal to 0.040 mg/L for TTHM and less than or equal to 0.030 mg/L for HAA5 at each monitoring location; or¶

(ii) Samples collected by water systems conducting annual or less frequent monitoring are less than or equal to 0.060 mg/L for TTHM and less than or equal to 0.045 mg/L for HAA5.¶

(C) Water suppliers must resume routine monitoring as prescribed in subsection (4)(c) of this rule, or begin increased monitoring as prescribed in subsection (4)(e) of this rule if:¶

(i) The LRAA based on quarterly monitoring exceeds 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 at any monitoring location; or¶

(ii) A sample collected at any location exceeds either 0.060 mg/L for TTHM or 0.045 mg/L for HAA5 when the monitoring frequency is annual or less frequent; or¶

(iii) The average annual source water TOC level, before any treatment, is greater than 4.0 mg/L at any treatment plant treating surface water or groundwater under the direct influence of surface water.¶

(D) Monitoring requirements for source water TOC. For water systems using surface water or GWUDI sources, TOC samples must be collected every 30 days at a location prior to any treatment in order to qualify for reduced TTHM and HAA5 monitoring as prescribed by this subsection, unless the water system is monitoring as prescribed by subsection (4)(k) of this rule. To remain on reduced monitoring, and in addition to meeting other criteria for reduced monitoring, the source water TOC running annual average must be  $\leq 4.0$  mg/L, based on the most recent four quarters of monitoring, on a continuing basis at a location prior to any treatment. Once qualified for reduced monitoring as prescribed by this subsection, a water system may reduce source water TOC monitoring to quarterly TOC samples collected every 90 days at a location prior to any treatment.¶

(E) A water system may be returned to routine monitoring at the Authority's discretion.¶

(e) Increased Monitoring:¶

(A) At water systems where annual or less frequent monitoring is required according to subsections (4)(c) or (4)(d) of this rule, monitoring must be increased to dual sample sets collected every 90 days at all locations if a TTHM or HAA5 sample exceeds the MCL at any location.¶

(B) At water systems where increased monitoring is conducted according to paragraph (4)(e)(A) of this rule, samples must be collected at the monitoring locations specified in the monitoring plan developed according to paragraph (4)(c)(B) of this rule.¶

(C) Monitoring may be returned to routine if at least four consecutive quarters of increased monitoring has been conducted and the LRAA for every monitoring location is less than or equal to 0.060 mg/L for TTHM and 0.045 mg/L for HAA5.¶

(f) Operational Evaluation Levels:¶

(A) The Operational evaluation level for TTHM or HAA5 has been exceeded at a monitoring location when the sum of the two previous quarters' sample results plus twice the current quarter's sample result, divided by 4, exceeds the MCL.¶

(B) Operational evaluation and report.¶

(i) At water systems where the operational evaluation level for either TTHM or HAA5 is exceeded, water suppliers must conduct an operational evaluation and submit a written report of the evaluation to the Authority no later than 90 days after being notified of the analytical result that causes the system to exceed the operational evaluation level. The written report must be made available to the public upon request.¶

(ii) Operational evaluations must include an examination of the water system's treatment and distribution practices, including but not limited to: storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation. The examination must also include what steps could be considered to minimize future exceedances.¶

(I) The Authority may allow water suppliers to limit the scope of the evaluation if the water supplier is able to identify the cause of the operational evaluation level exceedance.¶

(II) The request to limit the scope of the evaluation does not extend the schedule specified in subparagraph (4)(f)(B)(i) of this rule for submitting the written report. The Authority must approve this limited scope of evaluation in writing, and the water system must keep that approval with the completed report.¶

(g) Chlorite monitoring and compliance for community and NTNC water systems where chlorine dioxide is used for disinfection or oxidation.¶

(A) Routine monitoring.¶

(i) Daily monitoring. Samples must be collected every day at the entrance to the distribution system. For any daily sample that exceeds the chlorite MCL, the water supplier must collect additional samples in the distribution system the following day at the locations required by paragraph (4)(g)(B) of this rule, in addition to the sample required at the entrance to the distribution system.¶

(ii) Monthly monitoring. A three sample set must be collected every month in the distribution system. The water supplier must collect one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling must be conducted in the same manner (as three sample sets, at the



specified locations). The water supplier may use the results of additional monitoring conducted under paragraph (4)(g)(B) of this rule to meet the requirement for monitoring in this paragraph.¶

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

(C) Reduced monitoring.¶

(i) Chlorite monitoring at the entrance to the distribution system required by subparagraph (4)(g)(A)(i) of this rule may not be reduced.¶

(ii) Chlorite monitoring in the distribution system required by subparagraph (4)(g)(A)(ii) of this rule may be reduced to one three sample set per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under subparagraph (4)(g)(A)(ii) of this rule has exceeded the chlorite MCL and the system has not been required to conduct monitoring under paragraph (4)(g)(B) of this rule. The system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken quarterly in the distribution system under subparagraph (4)(g)(A)(ii) of this rule exceeds the chlorite MCL or the system is required to conduct monitoring under paragraph (4)(g)(B) of this rule, at which time the system must revert to routine monitoring.¶

(D) Compliance must be based on an arithmetic average of each three sample set taken in the distribution system as required by subparagraph (4)(g)(A)(ii) of this rule and paragraph (4)(g)(B) of this rule. If the arithmetic average of any three sample set exceeds the MCL, the water system is in violation of the MCL and must notify the public as required by OAR 333-061-0042(2)(b)(A), in addition to reporting to the Authority as required by OAR 333-061-0040.¶

(h) Bromate monitoring and compliance for water systems where ozone is used for disinfection or oxidation.¶

(A) Routine monitoring. One sample must be collected every month for each treatment plant in the water system using ozone. Water suppliers must collect samples monthly at the entrance to the distribution system while the ozonation system is operating under normal conditions.¶

(B) Reduced monitoring. Bromate monitoring may be reduced from monthly to quarterly if the bromate concentration is less than or equal to 0.0025 mg/L as a running annual average based on monthly bromate measurements for the most recent four quarters. Water suppliers may continue reduced monitoring as long as the running annual average of quarterly bromate samples is less than or equal to 0.0025 mg/L. If the running annual average bromate concentration is >0.0025 mg/L, the water supplier must resume routine monitoring as required by paragraph (4)(h)(A) of this rule.¶

(C) Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system takes more than one sample, the average of all samples collected during the month) collected by the water supplier as required by this subsection. If the average of samples covering any consecutive four quarter period exceeds the MCL, the water system is in violation of the MCL and must notify the public as required by OAR 333-061-0042(2)(b)(A), in addition to reporting to the Authority as required by OAR 333-061-0040. If a water supplier fails to complete 12 consecutive months monitoring, compliance with the MCL for the last four quarter compliance period must be based on an average of the available data.¶

(i) Monitoring and compliance requirements for disinfectant residuals.¶

(A) Chlorine and chloramines.¶

(i) Routine monitoring. At water systems where chlorine or chloramines are used, water suppliers must measure the residual disinfectant level at the same points in the distribution system and at the same time when total coliforms are sampled as specified in OAR 333-061-0036(6). At water systems where surface water or GWUDI sources are used, results of residual disinfectant concentration sampling conducted as required by OAR 333-061-0036(5)(a)(F) for unfiltered systems or OAR 333-061-0036(5)(b)(E) for systems which filter, may be used in lieu of collecting separate samples. Compliance with this rule is achieved when the running annual average of monthly averages of samples collected in the distribution system, computed quarterly, is less than or equal to the MRDL. Operators may increase residual disinfectant levels of chlorine or chloramine (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health in order to address specific microbiological contaminant problems resulting from events in the source water or in the distribution system.¶

(ii) Reduced monitoring from subparagraph (4)(i)(A)(i) of this rule is not allowed.¶

(iii) Compliance requirements for chlorine and chloramines.¶

(I) Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the water supplier as required by paragraph (4)(i)(A) of this rule. If the average covering any consecutive four quarter period exceeds the MRDL, the MRDL is exceeded and the water supplier must notify the public as required by OAR 333-061-0042(2)(b)(A), in addition to reporting to the Authority as required by OAR 333-061-0040.¶

(II) In cases where water suppliers switch between the use of chlorine and chloramines for residual disinfection at a water system during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted as required by OAR 333-061-0040(1) must clearly indicate which residual disinfectant was analyzed for each sample.¶

(B) Chlorine dioxide.¶

(i) Routine monitoring. At water systems where chlorine dioxide is used for disinfection or oxidation, water suppliers must collect daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, the water supplier must collect samples in the distribution system the following day at the locations required by subparagraph (4)(i)(B)(ii) of this rule, in addition to the sample required at the entrance to the distribution system. Compliance with this rule is achieved when daily samples are taken at the entrance to the distribution system and no two consecutive daily samples exceed the MRDL.¶

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

(iii) Chlorine dioxide monitoring may not be reduced from subparagraph (4)(i)(B)(ii) of this rule.¶

(iv) Compliance requirements for chlorine dioxide.¶

(I) Acute violations. Compliance must be based on consecutive daily samples collected by the water system as required by paragraph (4)(i)(B) of this rule. If any daily sample taken at the entrance to the distribution system exceeds the MRDL, and on the following day one (or more) of the three samples taken in the distribution system exceed the MRDL, the water system is in violation of the MRDL and must take immediate corrective action to lower the level of chlorine dioxide below the MRDL and must notify the public pursuant to the procedures for acute health risks as required by OAR 333-061-0042(2)(a)(C) in addition to reporting to the Authority as required by OAR 333-061-0040. Failure to take samples in the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system will also be considered an MRDL violation and the water system must notify the public of the violation in accordance with the provisions for acute violations as required by OAR 333-061-0042(2)(a)(C) in addition to reporting to the Authority as required by OAR 333-061-0040.¶

(II) Non-acute violations. Compliance must be based on consecutive daily samples collected by the system as required by paragraph (4)(i)(B) of this rule. If any two consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL, the water system is in violation of the MRDL and must take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and will notify the public pursuant to the procedures for non-acute health risks specified by OAR 333-061-0042(2)(b)(A), in addition to reporting to the Authority as required by OAR 333-061-0040. Failure to monitor at the entrance to the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system is also an MRDL violation and the water system must notify the public of the violation in accordance with the provisions for non-acute violations specified by OAR 333-061-0042(2)(b)(A) in addition to reporting to the Authority as required by OAR 333-061-0040.¶

(j) Additional requirements for purchasing water systems. Purchasing water systems that do not add a disinfectant, but deliver water where a disinfectant (oxidant) has been added to the water supply at any point in the treatment process must comply with analytical and monitoring requirements for chlorine and chloramines as prescribed in subsection (4)(i) of this rule.¶

(k) Monitoring requirements for disinfection byproduct precursors (DBPP).¶

(A) Routine monitoring. At water systems where surface water or GWUDI sources are used and where conventional filtration treatment is used, monitoring must be conducted at each treatment plant for TOC no later than the point of combined filter effluent turbidity monitoring and representative of the treated water. Monitoring for TOC must be conducted in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as paired samples. At the same time as the source water sample is collected, all water suppliers must also measure alkalinity in the source water prior to any treatment. Water suppliers must collect one paired sample and one source water alkalinity sample per month per treatment plant at a time representative of normal operating conditions and influent water quality.¶

(B) Reduced monitoring. At water systems using surface water or GWUDI sources with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year, monitoring may be reduced to one paired sample and one source water alkalinity sample per plant per quarter. The water system must revert to routine monitoring in the month following the quarter when the annual average treated water TOC is greater than or equal to 2.0 mg/L.¶

(C) Compliance must be determined as specified by OAR 333-061-0032(9)(e). Water suppliers may begin monitoring to determine whether Step 1 TOC removals can be met 12 months prior to the compliance date for the system. This monitoring is not required and failure to monitor during this period is not a violation. However, any water system that does not monitor during this period, and then determines in the first 12 months after the compliance date that it is not able to meet the Step 1 requirements as specified in OAR 333-061-0032(9)(d)(B) and must therefore apply for alternate minimum TOC removal (Step 2) requirements, is not eligible for retroactive approval of alternate minimum TOC removal (Step 2) requirements as allowed by OAR 333-061-0032(9)(d)(C) and is in violation. Water systems may apply for alternate minimum TOC removal (Step 2) requirements any time after the compliance date. For systems required to meet step 1 TOC removals, if the value calculated under OAR 333-061-0032(9)(e)(A)(iv) is less than 1.00, the system is in violation of the treatment technique requirements and must notify the public pursuant to OAR 333-061-0042(2)(b)(A), in addition to reporting to the Authority pursuant to OAR 333-061-0040.¶

(I) Disinfection Profiling and Disinfection Benchmarking. For any community, NTNC, or TNC utilizing surface water or GWUDI sources where a significant change to the disinfection treatment process as defined by OAR 333-061-0060(1)(e)(A) through (1)(e)(D) is proposed, the water supplier must conduct disinfection profiling and benchmarking for *Giardia lamblia* and viruses. For any community or NTNC water system where surface water or GWUDI sources are used and where the running annual average greater than or equal to 0.064 mg/l for TTHM or 0.048 mg/l for HAA5, the water supplier must conduct disinfection profiling for *Giardia lamblia*.¶

(A) For water systems serving at least 10,000 people, water suppliers must conduct the disinfection profiling in accordance with the USEPA Disinfection Profiling and Benchmarking Guidance Manual. The profile must be based on daily inactivation rate calculations over a period of 12 consecutive months. If chloramines, ozone, or chlorine dioxide is used as a primary disinfectant, the log inactivation for viruses must be calculated and an additional disinfection profile must be developed using a method approved by the Authority.¶

(B) At water systems serving less than 10,000 people, the disinfection profiling must be conducted in accordance with or the USEPA LT1-ESWTR Disinfection Profiling and Benchmarking Technical Guidance Manual. The profile must be based on weekly inactivation rate calculations collected on the same calendar day over a period of 12 consecutive months. If chloramines, ozone, or chlorine dioxide are used as a primary disinfectant, the log inactivation for viruses must be calculated and an additional disinfection profile must be developed using a method approved by the Authority.¶

(C) At water systems using either a single or multiple points of disinfection, monitoring must be conducted according to the following parameters to determine total log inactivation for each disinfection segment:¶

(i) The temperature of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow;¶

(ii) The pH of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow for systems using chlorine;¶

(iii) The disinfectant contact time(s) ("T") during peak hourly flow; and¶

(iv) The residual disinfectant concentration(s) ("C") of the water before or at the first customer and prior to each additional point of disinfection during peak hourly flow.¶

(D) Water suppliers required to develop disinfection profiles as prescribed by OAR 333-061-0060(1)(e) must meet the requirements of subparagraphs (4)(I)(D)(i) through (iii) of this rule:¶

(i) Water systems must monitor at least weekly for a period of 12 consecutive months to determine the total log inactivation for *Giardia lamblia* and viruses. If water systems monitor more frequently, the monitoring frequency must be evenly spaced. Water systems that operate for fewer than 12 months per year must monitor weekly during the period of operation;¶

(ii) Water systems must determine log inactivation for *Giardia lamblia* through the entire plant, based on CT99.9 values in Tables 21 through 28 in OAR 333-061-0036(5) as applicable; and¶

(iii) Water systems must determine log inactivation for viruses through the entire treatment plant based on a protocol approved by the Authority.¶

(E) Water suppliers must calculate the total inactivation ratio for *Giardia lamblia* as specified in this paragraph.¶

(i) Water systems using only one point of disinfectant application must determine the total inactivation ratio for the disinfection segment based on the methods specified in this paragraph.¶

(I) Water systems must determine one inactivation ratio (CTcalc/CT99.9) before or at the first customer during peak hourly flow; or¶

(II) Must determine successive (CTcalc/CT99.9) values, representing sequential inactivation ratios, between the

point of disinfectant application and a point before or at the first customer during peak hourly flow. Water systems must calculate the total inactivation ratio by determining (CT<sub>calc</sub>/CT<sub>99.9</sub>) for each sequence and then adding the (CT<sub>calc</sub>/CT<sub>99.9</sub>) values together to determine (CT<sub>calc</sub>/CT<sub>99.9</sub>).¶

(ii) For water systems where there is more than one point of disinfectant application before the first customer, water suppliers must determine the (CT<sub>calc</sub>/CT<sub>99.9</sub>) value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The (CT<sub>calc</sub>/CT<sub>99.9</sub>) value of each segment and (CT<sub>calc</sub>/CT<sub>99.9</sub>) must be calculated using the method in sub-subparagraph (4)(I)(E)(i)(II) of this rule.¶

(iii) The system must determine the total log of inactivation by multiplying the value calculated in subparagraphs (4)(I)(E)(i) or (ii) of this rule by 3.0.¶

(F) In lieu of conducting new monitoring as prescribed by paragraph (4)(I)(C) of this rule, water suppliers may elect to meet the requirements of subparagraphs (4)(I)(F)(i) or (ii) of this rule as follows:¶

(i) For water systems that have at least one year of existing data that are substantially equivalent to data collected in accordance with the provisions of this subsection may use these data to develop disinfection profiles as specified in this section if the water supplier has not made a significant change to treatment practices nor changed sources since the data were collected. Water suppliers may develop disinfection profiles using up to three years of existing data.¶

(ii) Water suppliers may use disinfection profile(s) developed as prescribed by this subsection in lieu of developing a new profile if the system has neither made a significant change to its treatment practice nor changed sources since the profile was developed. Water systems that have not developed a virus profile as prescribed by paragraph (4)(I)(G) of this rule must develop a virus profile using the same monitoring data on which the *Giardia lamblia* profile is based.¶

(G) Water suppliers must calculate the log of inactivation for viruses using a similar protocol as described in paragraph (4)(I)(D) of this rule, using a CT<sub>99.99</sub> and a multiplication factor of 4.0.¶

(H) A water system subject to OAR 333-061-0060(1)(e) must calculate a disinfection benchmark using the procedures specified in subparagraphs (4)(I)(H)(i) and (ii) of this rule to calculate a disinfection benchmark.¶

(i) For each year of profiling data collected and calculated as prescribed by paragraphs (4)(I)(A) through (G) of this rule, systems must determine the lowest mean monthly level of both *Giardia lamblia* and virus inactivation. Water systems must determine the mean *Giardia lamblia* and virus inactivation for each calendar month for each year of profiling data by dividing the sum of daily or weekly *Giardia lamblia* and virus log inactivation by the number of values calculated for that month.¶

(ii) The disinfection benchmark is the lowest monthly mean value (for water systems with one year of profiling data) or the mean of the lowest monthly mean values (for water systems with more than one year of profiling data) of *Giardia lamblia* and virus log inactivation in each year of profiling data.¶

(I) Water systems must retain the disinfection profile data in graphic form, such as a spreadsheet, which must be available for review by the Authority as part of a sanitary survey or other field visit contact.¶

(5) Surface Water Treatment.¶

(a) At public water systems that use a surface water source that do not provide filtration treatment, water suppliers must monitor water quality as specified in this subsection. At water systems using GWUDI sources, the monitoring must begin no later than 6 months after the Authority identified the source as being GWUDI.¶

(A) Fecal coliform or total coliform density measurements as required by OAR 333-061-0032(2)(a)(A) must be performed on representative source water samples immediately prior to the first or only point of disinfectant application. The system must sample for fecal or total coliforms at the minimum frequency shown in Table 20 each week the system serves water to the public. These samples must be collected on separate days. Also one fecal or total coliform density measurement must be made every day the system serves water to the public when the turbidity of the source water exceeds 1 NTU (these samples count towards the weekly coliform sampling requirement) unless the Authority determines that the system, for logistical reasons outside of its control, cannot have the sample analyzed within 30 hours of collection.¶

(B) Turbidity measurements to determine compliance with OAR 333-061-0030(3)(a) must be performed on representative grab samples of source water immediately prior to the first or only point of disinfectant application every four hours (or more frequently) that the system serves water to the public. A public water system may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the Authority. Systems using continuous turbidity monitoring must report the turbidity data to the Authority in the same manner that grab sample results are reported. The Authority will furnish report forms upon request.¶

(C) The total inactivation ratio for each day that the system is in operation must be determined based on the CT<sub>99.9</sub> values in Tables 21 through 28. The parameters necessary to determine the total inactivation ratio must be monitored as follows:¶

(i) The temperature of the disinfected water must be measured at least once per day at each residual disinfectant

concentration sampling point.¶

(ii) If the system uses chlorine, the pH of the disinfected water must be measured at least once per day at each chlorine residual disinfectant concentration sampling point.¶

(iii) The disinfectant contact time(s) ("T") in minutes must be determined for each day during peak hourly flow.¶

(iv) The residual disinfectant concentration(s) ("C") in mg/l before or at the first customer must be measured each day during peak hourly flow.¶

(v) If a system uses a disinfectant other than chlorine or UV, the system may demonstrate to the Authority, through the use of protocol approved by the Authority for on-site disinfection challenge studies or other information satisfactory to the Authority, that CT99.9 values other than those specified in the Tables 27 and 28 or other operational parameters are adequate to demonstrate that the system is achieving the minimum inactivation rates required by OAR 333-061-0032(3)(a).¶

(D) The total inactivation ratio must be calculated as follows:¶

(i) If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio based on either of the following two methods:¶

(I) One inactivation ratio ( $CT_{calc}/CT_{required}$ ) is determined before or at the first customer during peak hourly flow and if the  $CT_{calc}/CT_{required}$  is greater than or equal to 1.0, the *Giardia lamblia* inactivation requirement has been achieved; or¶

(II) Successive  $CT_{calc}/CT_{required}$  values representing sequential inactivation ratios, are determined between the point of disinfection application and a point before or at the first customer during peak hourly flow. Under this alternative, the following method must be used to calculate the total inactivation ratio:¶

Step 1: Determine  $CT_{calc}/CT_{required}$  for each sequence.¶

Step 2: Add the  $CT_{calc}/CT_{required}$  values together.¶

Step 3: If the sum of successive  $CT_{calc}/CT_{required}$  values is greater than or equal to 1.0, the *Giardia lamblia* inactivation requirement has been achieved.¶

(ii) If the system uses more than one point of disinfectant application before or at the first customer, the system must determine the CT value of each disinfection sequence immediately prior to the next point of disinfectant application during peak hourly flow. The  $CT_{calc}/CT_{required}$  value of each sequence and  $CT_{calc}/CT_{required}$  must be calculated using the methods in sub-subparagraph (5)(a)(D)(i)(II) of this rule to determine if the system is in compliance with OAR 333-061-0032(3)(a) or (5)(a).¶

(E) The residual disinfectant concentration of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day. If there is a failure in the continuous monitoring equipment, grab sampling every 4 hours may be conducted in lieu of continuous monitoring, but for no more than 5 working days following the failure of the equipment, and systems serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies prescribed in Table 29. The day's samples cannot be taken at the same time. The sampling intervals are subject to Authority review and approval. If at any time the residual disinfectant concentration falls below 0.2 mg/l in a system using grab sampling in lieu of continuous monitoring, the system must take a grab sample every 4 hours until the residual disinfectant concentration is > 0.2 mg/l.¶

(F) 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 section (6) of this rule, except that the Authority may allow a public water system which uses both a surface water source or a groundwater source under the 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 Authority determines that such points are more representative of treated (disinfected) water quality within the distribution system.¶

(b) A public water system that uses a surface water source or a groundwater source under the direct influence of surface water that does provide filtration treatment must monitor water quality as specified in this subsection when filtration treatment is installed.¶

(A) Turbidity:¶

(i) Turbidity measurements as required by section OAR 333-061-0032(4) must be performed on representative samples of the system's filtered water, measured prior to any storage, every four hours (or more frequently) that the system serves water to the public. A public water system may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the Authority.¶

(ii) Calibration of all turbidimeters must be performed according to manufacturer's specifications, but no less frequently than quarterly.¶

(iii) Water systems using conventional filtration must measure settled water turbidity every day.¶

(iv) Water systems using conventional or direct filtration must conduct turbidity profiles for individual filters every calendar quarter.¶

(v) For any systems using slow sand filtration or filtration treatment other than conventional treatment, direct

filtration, or diatomaceous earth filtration, the Authority may reduce the sampling frequency to once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance.¶

(vi) Systems using lime softening may acidify representative samples prior to analysis using a method approved by the Authority.¶

(B) The actual CT value achieved must be calculated each day the treatment plant is in operation. The parameters necessary to determine the actual CT value must be monitored as follows:¶

(i) The temperature of the disinfected water must be measured at least once per day at each residual disinfectant concentration sampling point as prescribed in subparagraph (5)(b)(B)(iv) of this rule.¶

(ii) If the system uses chlorine, the pH of the disinfected water must be measured at least once per day at each chlorine residual disinfectant concentration sampling point.¶

(iii) The disinfectant contact time(s) ("T") in minutes must be determined for each day during peak hourly flow, based on results of a tracer study conducted according to OAR 333-061-0050(6)(a)(R), or other method approved by the Authority.¶

(iv) The residual disinfectant concentration(s) ("C") in mg/l before or at the first customer must be measured each day during peak hourly flow.¶

(v) If a system uses a disinfectant other than chlorine, the system may demonstrate to the Authority, through the use of protocol approved by the Authority for on-site disinfection challenge studies or other information satisfactory to the Authority, or other operational parameters are adequate to demonstrate that the system is achieving the minimum inactivation rates required by OAR 333-061-0032(5)(a).¶

(C) The inactivation ratio calculations as prescribed in paragraph (5)(a)(D) of this rule.¶

(D) Monitoring for the residual disinfectant concentration entering the distribution system shall be performed as prescribed in paragraph (5)(a)(E) of this rule.¶

(E) Monitoring for the residual disinfectant concentration in the distribution system shall be performed as prescribed in paragraph (5)(a)(F) of this rule.¶

(F) Water systems using membrane filtration must perform direct integrity testing on each filter canister at least daily, per OAR 333-061-0036(5)(d)(B).¶

(c) Inactivation credit for water systems using a disinfectant other than chlorine for pathogen inactivation.¶

(A) Calculation of CT values.¶

(i) CT is the product of the disinfectant concentration (C, in milligrams per liter) and actual disinfectant contact time (T, in minutes). Systems with treatment credit for chlorine dioxide or ozone as prescribed by paragraphs (5)(c)(B) or (C) of this rule must calculate CT at least once per day, with both C and T measured during peak hourly flow as specified in paragraph (5)(b)(B) of this rule.¶

(ii) Systems with several disinfection segments in sequence must calculate CT for each segment where treatment credit is sought, where a disinfection segment is defined as a treatment unit process with a measurable disinfectant residual level and a liquid volume. If using this approach, water systems must add the Cryptosporidium CT values in each segment to determine the total CT for the treatment plant.¶

(B) CT values for chlorine dioxide and ozone.¶

(i) Systems receive the Cryptosporidium treatment credit listed in Table 30 by meeting the corresponding chlorine dioxide CT value for the applicable water temperature, as described in paragraph (5)(c)(A) of this rule.¶

(ii) Systems receive the Cryptosporidium treatment credit listed in Table 31 by meeting the corresponding ozone CT values for the applicable water temperature, as described in paragraph (5)(c)(A) of this rule.¶

(C) Site-specific study. The Authority may approve alternative chlorine dioxide or ozone CT values to those listed in Table 30 or Table 31 on a site-specific basis. The Authority must base this approval on a site-specific study conducted by a water system that follows an Authority approved protocol.¶

(D) Ultraviolet light. Systems receive Cryptosporidium, Giardia lamblia, and virus treatment credits for ultraviolet light (UV) reactors by achieving the corresponding UV dose values shown in subparagraph (5)(c)(D)(i) of this rule. Systems must validate and monitor UV reactors as described in OAR 333-061-0050(5)(k) and subparagraphs (5)(c)(D)(ii) and (iii) of this rule to demonstrate that they are achieving a particular UV dose value for treatment credit.¶

(i) UV dose table. The treatment credits listed in this table are for UV light at a wavelength of 254 nm as produced by a low pressure mercury vapor lamp. To receive treatment credit for other lamp types, systems must demonstrate an equivalent germicidal dose through reactor validation testing as specified in OAR 333-061-0050(5)(k). The UV dose values in Table 32 are applicable to post-filter applications of UV in filtered water systems, unfiltered water systems, and groundwater systems required to disinfect as prescribed by OAR 333-061-0032(6).¶

(ii) Water suppliers must monitor UV reactors according to this subparagraph.¶

(I) UV reactors must be monitored continuously to determine if the reactors are operating within validated conditions, as prescribed by OAR 333-061-0050(5)(k)(I)(i), including but not limited to UV intensity as measured by a UV sensor, flow rate, lamp status, and other parameters the Authority designates based on UV reactor

operation.¶

(II) UV transmittance must be monitored based on the validation method for the UV reactor.¶

(III) The calibration of UV sensors must be verified at least once every month and sensors must be recalibrated according to the EPA UV Disinfection Guidance Manual as necessary.¶

(iii) Water system suppliers must monitor the percentage of water delivered to the public that was treated within validated conditions for the required UV dose. It is a violation of this rule if less than 95 percent of water delivered was within a calendar month was treated to within validated conditions, and a Tier 2 public notice must be issued as prescribed by OAR 333-061-0042(3)(b).¶

(d) Requirements for individual filter effluent turbidity monitoring.¶

(A) At water systems where conventional or direct filtration treatment is used for surface water or GWUDI sources, continuous turbidity monitoring must be conducted for each individual filter.¶

(i) Water suppliers must calibrate turbidimeters using the procedure specified by the manufacturer.¶

(ii) Individual filter monitoring results must be recorded every 15 minutes.¶

(iii) If there is a failure in the continuous turbidity monitoring equipment, the water supplier must conduct grab sampling every four hours until the continuous turbidity monitoring equipment is repaired and returned to service.¶

(I) At water systems serving at least 10,000 people, continuous turbidity monitoring equipment must be repaired within five working days.¶

(II) At water systems serving less than 10,000 people, continuous turbidity monitoring equipment must be repaired within 14 days.¶

(iv) If a water system's conventional or direct filtration treatment consists of two or fewer filters, continuous monitoring of the combined filter effluent turbidity may be substituted for continuous monitoring of individual filter effluent turbidity. For water systems serving less than 10,000 people, the recording and calibration requirements that apply to individual filters also apply when continuous monitoring of combined filter effluent turbidity is substituted for continuous monitoring of individual filter effluent turbidity.¶

(B) Direct integrity testing for membrane filtration. Water systems must conduct direct integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane filtration process, and that meets the requirements described in this paragraph. A direct integrity test is defined as a physical test applied to a membrane unit in order to identify and isolate integrity breaches (that is, one or more leaks that could result in contamination of the filtrate).¶

(i) The direct integrity test must be independently applied to each membrane unit in service. A membrane unit is defined as a group of membrane modules that share common valving that allows the unit to be isolated from the rest of the water system for the purpose of integrity testing or other maintenance.¶

(ii) The direct integrity method must have a resolution of three micrometers or less, where resolution is defined as the size of the smallest integrity breach that contributes to a response from the direct integrity test.¶

(iii) The direct integrity test must have a sensitivity sufficient to verify the log treatment credit awarded to the membrane filtration process by the Authority, where sensitivity is defined as the maximum log removal value that can be reliably verified by a direct integrity test. Sensitivity must be determined using the approach in either sub-subparagraphs (5)(d)(B)(iii)(I) or (II) of this rule as applicable to the type of direct integrity test the system uses.¶

(I) For direct integrity tests that use an applied pressure or vacuum, the direct integrity test sensitivity must be calculated according to the following equation:¶

$$\text{LRVDIT} = \text{LOG}_{10} \left( \frac{Q_p}{(\text{VCF} \times Q_{\text{breach}})} \right). \quad \text{¶}$$

Where:¶

LRVDIT = the sensitivity of the direct integrity test;¶

$Q_p$  = total design filtrate flow from the membrane unit;¶

$Q_{\text{breach}}$  = flow of water from an integrity breach associated with the smallest integrity test response that can be reliably measured; and¶

VCF = volumetric concentration factor. The volumetric concentration factor is the ratio of the suspended solids concentration on the high pressure side of the membrane relative to that in the feed water.¶

(II) For direct integrity tests that use a particulate or molecular marker, the direct integrity test sensitivity must be calculated according to the following equation:¶

$$\text{LRVDIT} = \text{LOG}_{10}(\text{C}_f) - \text{LOG}_{10}(\text{C}_p). \quad \text{¶}$$

Where:¶

LRVDIT = the sensitivity of the direct integrity test;¶

$C_f$  = the typical feed concentration of the marker used in the test; and¶

$C_p$  = the filtrate concentration of the marker from an integral membrane unit.¶

(iv) Water systems must establish a control limit within the sensitivity limits of the direct integrity test that is indicative of an integral membrane unit capable of meeting the removal credit awarded by the Authority.¶

(v) If the result of a direct integrity test exceeds the control limit established under subparagraph (5)(d)(B)(iv) of

this rule, the water system must remove the membrane unit from service. Water systems must conduct a direct integrity test to verify any repairs, and may return the membrane unit to service only if the direct integrity test is within the established control limit.¶

(vi) Water systems must conduct direct integrity testing on each membrane unit at a frequency of not less than once each day that the membrane unit is in operation. The Authority may approve less frequent testing, based on demonstrated process reliability, the use of multiple barriers effective for *Cryptosporidium*, or reliable process safeguards.¶

(C) Indirect integrity monitoring for membrane filtration. Water systems must conduct continuous indirect integrity monitoring on each membrane unit according to the criteria specified in this paragraph. Indirect integrity monitoring is defined as monitoring some aspect of filtrate water quality that is indicative of the removal of particulate matter. A water system that implements continuous direct integrity testing of membrane units in accordance with the criteria specified in subparagraphs (5)(d)(B)(i) through (v) of this rule is not subject to the requirements for continuous indirect integrity monitoring. Water systems must submit a monthly report to the Authority summarizing all continuous indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken in each case.¶

(i) Unless the Authority approves an alternative parameter, continuous indirect integrity monitoring must include continuous filtrate turbidity monitoring.¶

(ii) Continuous monitoring must be conducted at a frequency of no less than once every 15 minutes.¶

(iii) Continuous monitoring must be separately conducted on each membrane unit.¶

(iv) If indirect integrity monitoring includes turbidity and the filtrate turbidity readings are above 0.15 NTU for a period greater than 15 minutes (that is, two consecutive 15-minute readings above 0.15 NTU), direct integrity testing in accordance with subparagraphs (5)(d)(B)(i) through (v) of this rule must immediately be performed on the associated membrane unit.¶

(v) If indirect integrity monitoring includes an Authority-approved alternative parameter and if the alternative parameter exceeds an Authority approved control limit for a period greater than 15 minutes, direct integrity testing in accordance with subparagraphs (5)(d)(B)(i) through (v) of this rule must immediately be performed on the associated membrane unit.¶

(e) Source water monitoring. Wholesale water systems, as defined in OAR 333-061-0020(1621), must comply with the requirements of this rule based on the population of the largest water system in the combined distribution system. Water systems required to provide filtration treatment must comply with the requirements of this rule whether or not the water system is currently operating filtration treatment. The requirements of this rule for unfiltered water systems only apply to those water systems that met and continue to meet the requirements of OAR 333-061-0032(2) and (3).¶

(A) Initial round. Water systems must conduct monitoring as prescribed by this paragraph, and following the schedule specified in paragraph (5)(e)(C) of this rule, unless the system meets the monitoring exemption criteria specified in paragraph (5)(e)(D) of this rule.¶

(i) Filtered water systems serving at least 10,000 people must sample their source water for *Cryptosporidium*, *E. coli*, and turbidity at least monthly for 24 months.¶

(ii) Unfiltered water systems serving at least 10,000 people must sample their source water for *Cryptosporidium* at least monthly for 24 months.¶

(iii) Filtered water systems serving less than 10,000 people must sample their source water for *E. coli* at least once every two weeks for 12 months. The *E. coli* monitoring specified in this subparagraph may be avoided if the system monitors for *Cryptosporidium* as prescribed in subparagraph (5)(e)(A)(iv) of this rule. The water system must notify the Authority no later than three months prior to the date the system is otherwise required to start *E. coli* monitoring under paragraph (5)(e)(C) of this rule.¶

(iv) Filtered water systems serving fewer than 10,000 people must sample their source water for *Cryptosporidium* at least twice per month for 12 months or at least monthly for 24 months if they meet one of the following, based on monitoring conducted in accordance with subparagraph (5)(e)(A)(iii) of this rule:¶

(I) The annual mean *E. coli* concentration, in the surface water source, is greater than 100 *E. coli*/100 mL;¶

(II) The water system does not conduct *E. coli* monitoring as described in subparagraph (5)(e)(A)(iii) of this rule; or¶

(III) Water systems using groundwater under the direct influence of surface water must comply with the requirements of this paragraph based on the *E. coli* level specified in sub-subparagraph (5)(e)(A)(iv)(I) of this rule.¶

(v) Unfiltered water systems serving fewer than 10,000 people must sample their source water for *Cryptosporidium* at least twice per month for 12 months or at least monthly for 24 months.¶

(vi) Water systems may sample more frequently than required under this section if the sampling frequency is evenly spaced throughout the monitoring period.¶

(vii) The Authority may approve monitoring for an indicator other than *E. coli* to comply with the monitoring prescribed by subparagraph (5)(e)(A)(iii) of this rule for filtered water systems serving fewer than 10,000 people.



The Authority may approve an alternative to the E. coli concentrations that trigger Cryptosporidium monitoring as specified in sub-subparagraphs (5)(e)(A)(iv)(I) and (III) of this rule. The Authority's approval to the system will be in writing and will include the basis for the Authority's determination that the alternative indicator or trigger level will provide a more accurate identification of whether a water system will exceed the Bin 1 Cryptosporidium level specified in Table 8 in OAR 333-061-0032(4)(f)(F).¶

(B) Water systems must conduct a second round of source water monitoring that meets the requirements for monitoring parameters, frequency, and duration described in paragraph (5)(e)(A) of this rule, and according to the schedule in paragraph (5)(e)(C) of this rule, unless they meet the monitoring exemption criteria specified in paragraph (5)(e)(D) of this rule.¶

(C) Monitoring schedule. Systems must begin monitoring as required in paragraphs (5)(e)(A) and (B) of this rule no later than the month beginning with the date listed in Table 33.¶

(D) Monitoring avoidance.¶

(i) Filtered water systems are not required to conduct source water monitoring as prescribed by this subsection if the system will provide a total of at least 5.5-log of treatment for Cryptosporidium, equivalent to meeting the treatment requirements of Bin 4 in OAR 333-061-0032(4)(g) and 333-061-0032(12) through (17).¶

(ii) Unfiltered water systems are not required to conduct source water monitoring as prescribed by this subsection if the system will provide a total of at least 3-log Cryptosporidium inactivation, equivalent to meeting the treatment requirements for unfiltered systems with a mean Cryptosporidium concentration of greater than 0.01 oocysts/L in OAR 333-061-0032(3)(e).¶

(iii) If a water system chooses to provide the level of treatment specified in subparagraph (5)(e)(D)(i) or (ii) of this rule, rather than conducting source water monitoring, the water system must notify the Authority in writing no later than the date the system is otherwise required to submit a sampling schedule for monitoring as prescribed by OAR 333-061-0036(5)(f)(A). A water system may choose to cease source water monitoring at any point after it has initiated monitoring if it notifies the Authority in writing that it will provide this level of treatment. Water systems must install and operate technologies to provide this level of treatment by the applicable treatment compliance date in OAR 333-061-0032(1)(a)(F).¶

(E) Seasonal plants. Systems with surface water or GWUDI treatment plants that operate for only part of the year must conduct source water monitoring in accordance with this subsection, but with the following modifications:¶

(i) Water systems must sample their source water only during the months that the plant is in use unless the Authority specifies another monitoring period based on plant operating practices.¶

(ii) Water systems with treatment plants that operate less than six months per year, and that monitor for Cryptosporidium, must collect at least six Cryptosporidium samples per year for two years of monitoring. Samples must be evenly spaced throughout the period the plant operates.¶

(F) New sources. A water system that begins using a new source of surface water or GWUDI after the system is required to begin monitoring as prescribed in paragraph (5)(e)(C) of this rule must monitor the new source on a schedule the Authority approves. Source water monitoring must meet the requirements of this subsection, and the water system must also meet the bin classification and Cryptosporidium treatment requirements of OAR 333-061-0032 for the new source on a schedule the Authority approves.¶

(i) This applies to water systems using surface water or GWUDI sources that begin operation after the monitoring start date applicable to the system's size specified in Table 33.¶

(ii) The water system must begin a second round of source water monitoring no later than six years following determination of the mean Cryptosporidium level or initial bin classification as prescribed by OAR 333-061-0032(2) or (4) respectively, as applicable.¶

(G) Failure to collect any source water sample in accordance with the sampling requirements, schedule, sampling location, analytical method, approved laboratory, and reporting requirements of this section is a monitoring violation.¶

(H) Grandfathering monitoring data. Systems may use monitoring data collected prior to the applicable monitoring start date in paragraph (5)(e)(C) of this rule to meet the initial source water monitoring requirements in paragraph (5)(e)(A) of this rule. Grandfathered data may substitute for an equivalent number of months at the end of the monitoring period. All data submitted under this paragraph must meet the requirements in subsection (5)(h) of this rule.¶

(f) Source water sampling schedules.¶

(A) Water systems required to conduct source water monitoring as prescribed in subsection (5)(e) of this rule must submit a sampling schedule that specifies the calendar dates when the system will collect each required sample.¶

(i) Water systems must submit sampling schedules to the Authority, no later than three months prior to the applicable date listed in paragraph (5)(e)(C) of this rule, for each round of required monitoring.¶

(ii) If the Authority does not respond to a water system regarding its sampling schedule, the system must sample at the reported schedule.¶

(B) Water systems must collect samples within a five-day period, starting two days before the scheduled sampling

date and ending two days after. The five-day period applies to each of the dates indicated in the sampling schedule unless one of the following conditions applies:¶

(i) An extreme condition or situation exists that may pose danger to the sample collector or that cannot be avoided, and that prevents the water system from sampling in the scheduled five-day period. In this case, the water system must sample as close to the scheduled date as possible unless the Authority approves an alternative sampling date. The water system must submit an explanation for the delayed sampling date to the Authority concurrent with the submittal of the sample to the laboratory; or¶

(ii) A water system is unable to report a valid analytical result for the scheduled sampling date due to equipment failure, loss of or damage to the sample, failure to comply with the analytical method requirements (including the quality control requirements), or the failure of an approved laboratory to analyze the sample.¶

(I) In this case the water system must collect a replacement sample as prescribed in sub-subparagraph (5)(f)(B)(ii)(II) of this rule.¶

(II) The system must collect the replacement sample not later than 21 days after receiving information that an analytical result cannot be reported for the scheduled date unless the water system demonstrates that collecting a replacement sample within this time frame is not feasible or the Authority approves an alternative re-sampling date. The system must submit an explanation for the delayed sampling date to the Authority concurrent with the submittal of the sample to the laboratory.¶

(iii) Water systems that fail to meet the criteria of paragraph (5)(f)(B) of this rule for any required source water sample must revise their sampling schedules to add dates for collecting all missed samples. Water systems must submit the revised sampling schedule to the Authority for approval prior to beginning collecting the missed samples.¶

(g) Source water sampling locations.¶

(A) Water systems required to conduct source water monitoring as prescribed in subsection (5)(e) of this rule must collect samples for each plant that treats a surface water or GWUDI source. Where multiple plants draw water from the same influent, such as the same pipe or intake, the Authority may approve one set of monitoring results to be used to satisfy the requirements for all treatment plants.¶

(B) Water systems must collect source water samples prior to chemical treatment, such as coagulants, oxidants and disinfectants, unless the Authority approves the system to collect a source water sample after chemical treatment if the Authority determines that collecting a sample prior to chemical treatment is not feasible for the system and that the chemical treatment is unlikely to have a significant adverse effect on the analysis of the sample.¶

(C) Water systems that recycle filter backwash water must collect source water samples prior to the point of filter backwash water addition.¶

(D) Bank filtration.¶

(i) Water systems that receive Cryptosporidium treatment credit for bank filtration as an alternate filtration technology as specified by OAR 333-061-0032(8) must collect source water samples in the surface water source prior to bank filtration.¶

(ii) Water systems that use bank filtration as pretreatment to a filtration plant must collect source water samples from the well, after bank filtration. Use of bank filtration during monitoring must be consistent with routine operational practice. Water systems collecting samples after a bank filtration process may not receive treatment credit for the bank filtration prescribed by OAR 333-061-0032(8).¶

(E) Multiple sources. Water systems with treatment plants that use multiple water sources, including multiple surface water sources and blended surface water and groundwater sources, must collect samples as specified in subparagraph (5)(g)(E)(i) or (ii) of this rule. The use of multiple sources during monitoring must be consistent with routine operational practice.¶

(i) If a sampling tap is available where the sources are combined prior to treatment, water systems must collect samples from this tap.¶

(ii) If a sampling tap where the sources are combined prior to treatment is not available, systems must collect samples at each source near the intake on the same day and must comply with either sub-subparagraph (5)(g)(E)(ii)(I) or (II) below for sample analysis.¶

(I) Water systems may composite samples from each source into one sample prior to analysis. The volume of sample from each source must be weighted according to the proportion of the source in the total plant flow at the time the sample is collected.¶

(II) Water systems may analyze samples from each source separately and calculate a weighted average of the analysis results for each sampling date. The weighted average must be calculated by multiplying the analysis result for each source by the fraction the source contributed to total plant flow at the time the sample was collected and then adding these values.¶

(F) Additional requirements. Water systems must submit a description of their sampling location(s) to the Authority at the same time as the sampling schedule required under subsection (5)(f) of this rule. This description

must address the position of the sampling location in relation to the system's water source(s) and treatment processes, including pretreatment, points of chemical treatment, and filter backwash recycle. If the Authority does not respond to a water system regarding sampling location(s), the system must sample at the reported location(s).¶

(h) Grandfathering previously collected data.¶

(A) Water systems may comply with the initial source water monitoring requirements of paragraph (5)(e)(A) of this rule by grandfathering sample results collected before the system is required to begin monitoring. To be grandfathered, the sample results and analysis must meet the criteria in this section and the Authority must approve the previously sampled data.¶

(i) A filtered water system may grandfather Cryptosporidium samples to meet the monitoring requirements of paragraph (5)(e)(A) of this rule when the system does not have corresponding E. coli and turbidity samples.¶

(ii) A water system that grandfathers Cryptosporidium samples is not required to collect the E. coli and turbidity samples when the system completes the requirements for Cryptosporidium monitoring under paragraph (5)(e)(A) of this rule.¶

(B) The analysis of grandfathered E. coli and Cryptosporidium samples must meet the analytical method and approved laboratory requirements of subsections (1)(a) and (1)(c) of this rule.¶

(C) The sampling location of grandfathered samples must meet the conditions specified in subsection (5)(g) of this rule.¶

(D) Grandfathered Cryptosporidium samples must have been collected no less frequently than each calendar month on a regular schedule, and no earlier than January 1999. Sample collection intervals may vary for the conditions specified in subparagraph (5)(f)(B)(i) through (ii) of this rule if the system provides documentation of the condition when reporting monitoring results.¶

(i) The Authority may approve grandfathering of previously collected data where there are time gaps in the sampling frequency if the water system conducts additional monitoring as specified by the Authority to ensure that the data used to comply with the initial source water monitoring requirements of paragraph (5)(e)(A) of this rule are seasonally representative and unbiased.¶

(ii) Water systems may grandfather previously collected data where the sampling frequency within each month varied. If the Cryptosporidium sampling frequency varied, water systems must follow the monthly averaging procedure in OAR 333-061-0032(2)(c)(B) or OAR-333-061-0032(4)(f)(E) as applicable, when calculating the bin classification for filtered water systems or the mean Cryptosporidium concentration for unfiltered water systems.¶

(E) Reporting monitoring results for grandfathering. Water systems that request to grandfather previously collected monitoring results must report the following information by the applicable dates listed in this paragraph.¶

(i) Water systems must report that they intend to submit previously collected monitoring. This report must specify the number of previously collected results the system will submit, the dates of the first and last sample, and whether a system will conduct additional source water monitoring to meet the requirements of paragraph (5)(e)(A) of this rule. Water systems must report this information no later than the date the sampling schedule is required as prescribed by subsection (5)(f) of this rule.¶

(ii) Water systems must report previously collected monitoring results for grandfathering, along with the associated documentation listed in sub-subparagraphs (5)(h)(E)(ii)(I) through (IV) of this rule, no later than two months after the applicable date listed in paragraph (5)(e)(C) of this rule.¶

(I) For each sample result, water systems must report the applicable data elements specified by OAR 333-061-0040(1)(o).¶

(II) Water systems must certify that the reported monitoring results include all results the system generated during the time period beginning with the first reported result and ending with the final reported result. This applies to samples that were collected from the sampling location specified for source water monitoring under this paragraph and analyzed in accordance with subsection (1)(a) of this rule.¶

(III) Water systems must certify that the samples were representative of a plant's source water(s) and that the source water(s) have not changed. Water systems must report a description of the sampling location(s), which must address the position of the sampling location in relation to the system's water source(s) and treatment processes, including points of chemical addition and filter backwash recycle.¶

(IV) For Cryptosporidium samples, the laboratory or laboratories that analyzed the samples must provide a letter certifying that the quality control criteria in accordance with subsection (1)(a) of this rule were met for each sample batch associated with the reported results. Alternatively, the laboratory may provide bench sheets and sample examination report forms for each field, matrix spike, IPR, OPR, and method blank sample associated with the reported results.¶

(F) If the Authority determines that a previously collected data set submitted for grandfathering was generated during source water conditions that were not normal for the system, such as a drought, the Authority may

disapprove the data. Alternatively, the Authority may approve the previously collected data if the water system reports additional source water monitoring data, as determined by the Authority, to ensure that the data set used under OAR 333-061-0032(4)(f) or 0032(2)(c) represents average source water conditions for the system.¶

(G) If a water system submits previously collected data that fully meets the number of samples required for initial source water monitoring required by paragraph (5)(e)(A) of this rule, and some of the data is rejected due to not meeting the requirements of this subsection, systems must conduct additional monitoring to replace rejected data on a schedule the Authority approves. Water systems are not required to begin this additional monitoring until two months after notification that data has been rejected and that additional monitoring is necessary.¶

(6) Coliform Bacteria and Microbiological Contaminants.¶

(a) General requirements for coliform bacteria sampling.¶

(A) Sample Handling Requirements and Sample Types.¶

(i) The standard sample volume required for analysis, regardless of analytical method used, is 100 ml.¶

(ii) Only the presence or absence of total coliforms and *E. coli* is required to be determined, not a determination of density.¶

(iii) Test medium incubation must be initiated within 30 hours of sample collection. Samples should be held below 10 deg. C during transit.¶

(iv) If water having residual chlorine (measured as free, combined, or total chlorine) is to be analyzed, sufficient sodium thiosulfate ( $\text{Na}_2\text{S}_2\text{O}_3$ ) must be added to the sample bottle before sterilization to neutralize any residual chlorine in the water sample. Dechlorination procedures are addressed in Section 9060A.2 of Standard Methods for the Examination of Water and Wastewater (20th and 21st editions).¶

(v) There are three types of samples collected in the distribution system for coliform bacteria.¶

(I) Routine samples are collected to satisfy the monitoring requirements specified in this rule from established sampling locations according to a water system's coliform sampling plan. These samples are used to calculate compliance with the MCL for *E. coli* prescribed in OAR 333-061-0030(4) and with the coliform investigation triggers specified in OAR 333-061-0078.¶

(II) Repeat samples are collected according to subsection (6)(g) of this rule as a follow-up to a total coliform-positive routine sample and are used to calculate compliance with the MCL for *E. coli* prescribed in OAR 333-061-0030(4) and with the coliform investigation triggers specified in OAR 333-061-0078.¶

(III) Special samples are not considered representative of the water system and are outside the scope of normal water quality assurance and control procedures. Examples of when special samples may be collected include, but are not limited to, investigating user complaints, verifying disinfection after construction or repair and samples from sources not in service. Analyses of special samples must be made available to the Authority upon request and records of such analyses shall be maintained according to OAR 333-061-0040(2)(b).¶

(B) Water suppliers must comply with the repeat monitoring requirements and *E. coli* analytical requirements specified in subsection (6)(g) of this rule following any total coliform-positive sample collected according to subsections (6)(b) through (6)(f) of this rule.¶

(C) Water suppliers must determine whether a coliform investigation trigger as specified in OAR 333-061-0078(2) has been exceeded once all monitoring as required by subsections (6)(b) through (6)(g) of this rule has been completed for a calendar month.¶

(D) If a routine or repeat sample is total coliform-positive, the sample must be analyzed to determine if *E. coli* are present. If *E. coli* are present, the water supplier must notify the Authority by the end of the day when the water supplier is notified of the test result, unless the water supplier is notified of the result after the Authority office is closed, in which case the water supplier must notify the Authority before the end of the next business day.¶

(E) The Authority may, on a case-by-case basis, allow a water supplier to forgo *E. coli* testing on a total coliform-positive sample if that water supplier assumes that the total coliform-positive sample is *E. coli*-positive. Accordingly, the water supplier must notify the Authority as specified in paragraph (6)(a)(D) of this rule and take action appropriate for exceeding the MCL for *E. coli* as specified in OAR 333-061-0030(4).¶

(F) The Authority may invalidate a total coliform-positive sample only if the conditions specified in subparagraph (6)(a)(F)(i), (ii), or (iii) of this rule are met. A total coliform-positive sample invalidated according to this paragraph does not count toward meeting the minimum monitoring requirements of this rule.¶

(i) The laboratory establishes that improper sample analysis caused the total coliform-positive result.¶

(ii) The Authority, on the basis of the results of repeat samples collected as required by subsection (6)(g) of this rule, determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem in which coliform was present only in samples collected at a specific service connection within a public water system with more than one service connection. The Authority cannot invalidate a sample on the basis of repeat sample results unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected at a location other than the original tap are total coliform-negative (for example, the Authority cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative, or if the water system has only one

service connection).¶

(iii) The Authority has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition that does not reflect water quality in the distribution system. In this case, the water supplier must still collect all repeat samples required by subsection (6)(g) of this rule, and use them to determine whether a coliform investigation trigger as specified in OAR 333-061-0078(2) has been exceeded. To invalidate a total coliform-positive sample under this paragraph, the decision and supporting rationale must be documented in writing, and approved and signed by the supervisor of the Authority official who recommended the decision. The written documentation must state the specific cause of the total coliform-positive sample, and what action the water supplier has taken, or will take, to correct this problem. The Authority will not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative. If the Authority invalidates a sample according to this subparagraph the written documentation will be made available to the EPA or the public upon request.¶

(G) A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (for example, the Multiple-Tube Fermentation Technique), produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P-A) Coliform Test, or exhibits confluent growth where there is continuous bacterial growth covering the entire filtration area of a membrane filter, or a portion thereof, in which bacterial colonies are not discrete, or produces colonies too numerous to count where the total number of bacterial colonies exceeds 200 on a 47 mm diameter membrane filter with an analytical method using a membrane filter (for example, Membrane Filter Technique). If a laboratory invalidates a sample because of such interference, the system must collect another sample from the same location as the original sample within 24 hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The water supplier must continue to re-sample within 24 hours and have the samples analyzed until it obtains a valid result. The Authority may waive the 24-hour time limit on a case-by-case basis.¶

(H) A total coliform-positive sample invalidated according to paragraphs (6)(a)(F) or (G) of this rule does not count toward meeting the minimum monitoring requirements specified in this section.¶

(I) Water suppliers must develop a written coliform sampling plan for every water system that they own or operate or for which they are responsible according to the criteria in this paragraph by March 31, 2016. The plan must identify sampling sites and a sample collection schedule that is representative of water throughout the distribution system. Water suppliers must collect total coliform samples according to the plan. Plans are subject to Authority review and revision.¶

(i) Monitoring required by subsections (6)(b) through (6)(g) of this rule may take place at a customer's premises, dedicated sampling station, or other designated sampling location. Routine and repeat sample sites and any sampling points necessary to meet the requirements of subsection (6)(i) of this rule must be reflected in the coliform sampling plan.¶

(ii) Samples must be collected at regular time intervals throughout the month, except that groundwater systems serving 4,900 or fewer people may collect all required samples on a single day if they are collected at different sites.¶

(iii) Water suppliers must collect at least the minimum number of required samples every month even if the MCL for E. coli as specified in OAR 333-061-0030(4) was exceeded or a coliform investigation trigger as specified in OAR 333-061-0078(2) was exceeded.¶

(iv) Water suppliers may use monitoring as a tool to assist in investigating problems whereby additional samples beyond the number required by this section may be collected to investigate potential problems in the distribution system. A water supplier collecting more routine samples than required in a month must include the results of the additional sampling in calculating whether a coliform investigation trigger as specified in OAR 333-061-0078(2) has been exceeded only if the samples are collected in accordance with an existing coliform sampling plan and are representative of water throughout the distribution system.¶

(v) Water suppliers must identify repeat monitoring locations in the coliform sampling plan. At least one repeat sample must be collected from the sampling tap where the original total coliform-positive sample was collected, at least one repeat sample must be collected at a tap within five service connections upstream and at least one repeat sample must be collected at a tap within five service connections downstream of the original sampling site unless the provisions of sub-subparagraphs (6)(a)(I)(v)(I) or (6)(a)(I)(v)(II) of this rule are met. If a total coliform-positive sample is at the end of the distribution system, or one service connection away from the end of the distribution system, the Authority may allow an alternative sampling location in lieu of the requirement to collect at least one repeat sample upstream or downstream of the original sampling site. Except as provided for in sub-subparagraph (6)(a)(I)(v)(II) of this rule, at water systems where triggered source water monitoring is required according to paragraph (6)(i)(A), groundwater source samples must be collected in addition to repeat samples as required by subsection (6)(g) of this rule.¶

(I) Water suppliers may propose repeat monitoring locations to the Authority that the water supplier believes to

be representative of a pathway for contamination of the distribution system. A water supplier may elect to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis in a standard operating procedure (SOP) in its coliform sampling plan. The water supplier must design its SOP to focus the repeat samples at locations that best verify and determine the extent of potential contamination of the distribution system area based on specific situations. The Authority may modify the SOP or require alternative monitoring locations as needed.¶

(II) For groundwater systems serving 1,000 people or less, repeat sampling locations may be proposed that differentiate potential source water and distribution system contamination (for example, by sampling at entry points to the distribution system). A water system with a single groundwater source and a single service connection may request to collect repeat samples at the location for triggered source water monitoring. The Authority may approve the request if the water supplier demonstrates that the coliform sampling plan remains representative of water quality in the distribution system. If approved by the Authority, the sample result may be used to meet the monitoring requirements in both subsection (6)(g) and (6)(i) of this rule.¶

(III) Triggered source water monitoring locations as required by subsection (6)(i) of this rule must be identified in the plan in addition to the repeat samples required by subsection (6)(g) of this rule.¶

(IV) The Authority may review, revise, and approve, as appropriate, repeat sampling proposed by systems under sub-subparagraphs (6)(a)(I)(v)(I) and (II) of this rule. The water supplier must demonstrate that the coliform sampling plan remains representative of the water quality in the distribution system. The Authority may determine that monitoring at the entry point to the distribution system (especially for groundwater systems without disinfection) is effective to differentiate between potential source water and distribution system problems.¶

(b) At NTNC and TNC, TNC and state regulated water systems using only groundwater as defined in OAR 333-061-0020(687) and serving 1,000 people or less, one sample must be collected for coliform bacteria every calendar quarter the water system provides water to the public. At seasonal water systems as defined in OAR 333-061-0020(12018), monitoring must be conducted at least once every month the system is in operation.¶

(A) For the purpose of determining a water supplier's eligibility to continue or qualify for quarterly monitoring according to the provisions of subparagraphs (6)(b)(C)(iv) or (6)(b)(D)(ii) of this rule at a TNC, the Authority may elect to not consider monitoring violations according to paragraph (6)(p)(A) of this rule if the missed sample is collected no later than the end of the monitoring period following the monitoring period in which the sample was missed. The water supplier must collect the make-up sample in a different week than the routine sample for that monitoring period and should collect the sample as soon as possible during the monitoring period.¶

(B) Water suppliers must submit to a special monitoring evaluation during each sanitary survey as specified in OAR 333-061-0076 to review the status of a water system, including the distribution system, and determine whether the system is on an appropriate monitoring schedule. After the Authority has performed the special monitoring evaluation, it may modify the system's monitoring schedule, as necessary, or it may allow the system to stay on its existing monitoring schedule, consistent with the provisions of this subsection.¶

(C) Monitoring must be increased to monthly the month following any of the events identified in subparagraphs (6)(b)(C)(i) through (6)(b)(C)(iv) of this rule. Monthly monitoring must continue until the requirements in subparagraph (6)(b)(D) of this rule are met. A water system prescribed monthly monitoring for reasons other than those identified in subparagraphs (6)(b)(C)(i) through (6)(b)(C)(iv) of this rule is not considered to be on increased monitoring for the purposes of this paragraph and will be restored to quarterly monitoring at the discretion of the Authority.¶

(i) One level 2 coliform investigation or two level 1 coliform investigations are triggered as specified in OAR 333-061-0078(2) at a water system in a rolling 12-month period.¶

(ii) The MCL for E. coli is exceeded at a water system.¶

(iii) A violation as specified in OAR 333-061-0078(5) occurs at a water system.¶

(iv) Two violations as specified in subsection (6)(p) of this rule occur, or one violation as specified in subsection (6)(p) of this rule occurs and one level 1 coliform investigation as prescribed by OAR 333-061-0078(2) is triggered during a rolling 12-month period for a water system.¶

(D) The Authority may reduce the monitoring frequency from monthly monitoring as specified in paragraph (6)(b)(C) of this rule to quarterly monitoring if the criteria specified in subparagraphs (6)(b)(D)(i) and (6)(b)(D)(ii) of this rule are met.¶

(i) A sanitary survey, level 2 coliform investigation or an equivalent site visit was completed by the Authority or another party authorized by the Authority within the previous 12 months, and the water system was found to be free of sanitary defects and to have a protected water source; and¶

(ii) The water supplier ensured the following at the water system for at least the previous 12 consecutive months:¶

(I) No MCL exceedances as prescribed by OAR 333-061-0030(4) or 40 CFR 141.63;¶

(II) That all samples required by this rule and 40 CFR 141.21 were collected and reported to the Authority;¶

(III) No coliform investigation trigger exceedances as prescribed by OAR 333-061-0078(2); and¶

(IV) No coliform investigation violations as prescribed by OAR 333-061-0078(5).¶

(E) Additional routine monitoring the month following a total coliform-positive sample. At least three routine samples must be collected during the next month following one or more total coliform-positive samples at water systems prescribed quarterly monitoring. The Authority may waive this requirement if the conditions of subparagraphs (6)(b)(E)(i), (6)(b)(E)(ii), or (6)(b)(E)(iii) of this rule are met. Samples may either be collected at regular time intervals throughout the month or may be collected on a single day if samples are collected at different sites. The results from the analysis of additional routine samples must be used to determine if a coliform investigation trigger was exceeded as specified in OAR 333-061-0078(2).¶

(i) The Authority may waive the requirement to collect three routine samples as required by paragraph (6)(b)(E) of this rule if the Authority, or a party authorized by the Authority, performs a site visit before the end of the next month in which the system provides water to the public. The site visit must be sufficiently detailed to allow the Authority to determine whether additional monitoring or any corrective action is needed. A representative of the water supplier may not perform this site visit, even if the representative is a party authorized by the Authority to perform sanitary surveys.¶

(ii) The Authority may waive the requirement to collect three routine samples as required by paragraph (6)(b)(E) of this rule if the Authority has determined why the sample was total coliform-positive and has established that the water supplier has corrected the problem or will correct the problem before the end of the next month in which the water system serves water to the public. In this case, the Authority must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by an Authority supervisor who recommends such a decision, and make this document available to the EPA and public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the water supplier has taken or will take to correct this problem.¶

(iii) The Authority will not waive the requirement to collect three additional routine samples the next month in which the system provides water to the public solely on the grounds that all repeat samples are total coliform-negative. If the Authority determines that the water supplier has corrected the contamination problem before the set of repeat samples required by subsection (6)(g) of this rule is collected, and all repeat samples were total coliform-negative, the Authority may waive the requirement for additional routine monitoring the next month.¶

(c) At community water systems using only groundwater as defined in OAR 333-061-0020(687) serving 1,000 people or less, one sample must be collected for coliform bacteria every month.¶

(d) At water systems using surface water or GWUDI serving 1,000 people or less, one sample must be collected for coliform bacteria every month.¶

(e) At public water systems serving more than 1,000 people, the monitoring frequency for total coliform bacteria is based on the population served by the system, as specified in Table 34.¶

(f) At water systems using surface water or GWUDI without filtration treatment as specified in OAR 333-061-0032(2) and (3), at least one sample must be collected near the first service connection every day the turbidity level measured as specified in OAR 333-061-0036(5)(a)(B) exceeds 1 NTU. The sample must be analyzed for the presence of total coliform bacteria and must be collected within 24 hours of the first exceedance, unless the Authority determines that the water supplier, for logistical reasons beyond its control, cannot have the sample analyzed within 30 hours of collection and identifies an alternative sample collection schedule. Sample results from this coliform monitoring must be included in determining whether a coliform investigation trigger as specified in OAR 333-061-0078(2) was exceeded.¶

(g) If a sample collected as prescribed by subsections (6)(b) through (6)(f) of this rule is total coliform-positive, a set of repeat samples must be collected within 24 hours of being notified of the positive result. No fewer than three repeat samples must be collected for each total coliform-positive sample found.¶

(A) The Authority may extend the 24-hour limit on a case-by-case basis if a logistical problem beyond its control prevents a water supplier from collecting the repeat samples within 24 hours.¶

(B) All repeat samples must be collected on the same day, except that at water systems with only a single service connection the Authority may allow the required set of repeat samples to be collected over a three-day period, or the collection of a larger volume repeat sample(s) in one or more sample containers of any size as long as the total volume collected is at least 300 ml.¶

(C) An additional set of repeat samples must be collected if one or more repeat samples in the current set of repeat samples is total coliform-positive. The additional set of repeat samples must be collected within 24 hours of being notified of the positive result, unless the Authority extends the limit as specified in paragraph (6)(g)(A) of this rule. Water suppliers must continue to collect additional sets of repeat samples until either total coliforms are not detected in one complete set of repeat samples or the water supplier determines that a coliform investigation trigger as specified in OAR 333-061-0078(2) was exceeded as a result of a repeat sample being total coliform-positive and notifies the Authority. If a trigger identified in OAR 333-061-0078(2) is exceeded as a result of a routine sample being total coliform-positive, water suppliers are required to conduct only one round of repeat

monitoring for each total coliform-positive routine sample.¶

(D) After a water supplier collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample, after analysis, is found to be total coliform-positive, then the water supplier may count the subsequent sample(s) as a repeat sample instead of as a routine sample.¶

(E) Repeat samples collected at a groundwater source.¶

(i) If a repeat sample as specified in this subsection was collected at the location for triggered source water monitoring as specified in paragraph (6)(i)(A) of this rule and is E. coli-positive, the MCL for E. coli as specified in OAR 333-061-0030(4) was exceeded and the water supplier must also comply with subsection (6)(j) of this rule. If more than one repeat sample is collected at the monitoring location required for triggered source water monitoring, the water supplier may reduce the number of additional source water samples required by subsection (6)(j) of this rule by the number of repeat samples taken at that location that were not E. coli-positive.¶

(ii) If more than one repeat sample is collected at the location for triggered source water monitoring as specified in paragraph (6)(i)(A) of this rule, and more than one repeat sample is E. coli-positive, the MCL for E. coli was exceeded and the water supplier must also comply with OAR 333-061-0032(6).¶

(iii) If all repeat samples collected at the location for triggered source water monitoring as specified in paragraph (6)(i)(A) of this rule are E. coli-negative and a repeat sample collected at a monitoring location other than one required for triggered source water monitoring is E. coli-positive, the MCL for E. coli was exceeded, but the water supplier is not required to comply with subsection (6)(j) of this rule.¶

(h) Sampling for additional pathogens may be required by the Authority when specific evidence indicates the possible presence of such organisms.¶

(i) Groundwater source sampling requirements:¶

(A) At least one sample must be collected from every groundwater source for which at least 4-log treatment of viruses is not applied before or at the first customer within 24 hours of notification of a total coliform-positive sample collected as prescribed by subsections (6)(b) through (6)(f) of this rule that is not invalidated according to paragraphs (6)(a)(F) or (G) of this rule.¶

(i) The sample must be collected from every groundwater source in use at the time the total coliform-positive sample was collected, except as provided by subparagraph (6)(i)(A)(ii) of this rule.¶

(ii) If approved by the Authority, the sampling required by this subsection may be conducted at a representative groundwater source or sources at water systems with more than one ground water source. If directed by the Authority, water suppliers must request approval of a triggered source water monitoring plan that identifies one or more ground water sources that are representative of each monitoring site in a system's coliform sampling plan according to paragraph (6)(a)(I) of this rule and that the water supplier intends to use for representative sampling under this paragraph.¶

(iii) The Authority may extend the 24-hour time limit for the collection of samples on a case-by-case basis if the water supplier cannot collect the sample(s) within 24 hours due to circumstances beyond its control. In the case of an extension, the Authority will specify how much time the water supplier has to collect the sample(s).¶

(iv) A water supplier is not required to comply with the source water monitoring requirements specified in this paragraph if either of the following conditions exists:¶

(I) The Authority determines, and documents in writing, that the total coliform-positive sample collected as prescribed by subsections (6)(b) through (6)(f) of this rule is caused by a distribution system deficiency; or¶

(II) The total coliform-positive sample collected as prescribed by subsections (6)(b) through (6)(f) of this rule is collected at a location that meets Authority criteria for distribution system conditions that will cause total coliform-positive samples.¶

(v) Groundwater source samples required by this subsection must be collected at a location prior to any treatment unless the Authority approves an alternative sampling location. If the water system's configuration does not allow for sampling at the groundwater source, the water system must collect a sample at an Authority-approved location representative of source water quality.¶

(B) Additional Requirements related to wholesale water systems that use groundwater sources without providing at least 4-log inactivation of viruses for each groundwater source and purchasing water systems.¶

(i) If a sample collected according to subsections (6)(b) through (6)(f) of this rule at a purchasing water system is total coliform-positive, the water supplier for that purchasing system must notify the water supplier for the wholesale system(s) within 24 hours of being notified of the total coliform-positive sample.¶

(ii) If the water supplier for a wholesale system receives notice that a sample collected according to subsections (6)(b) through (6)(f) of this rule at a purchasing water system it serves is total coliform-positive, the wholesaler must collect a sample from its groundwater source(s) as prescribed by paragraph (6)(i)(A) of this rule and have it analyzed for E. coli within 24 hours of notification.¶

(iii) If a sample collected according to subparagraph (6)(i)(A) of this rule at a wholesale system is E. coli-positive, the water supplier must notify the water supplier(s) for all purchasing water systems served by the groundwater



source of the E. coli-positive source water sample within 24 hours of being notified of the result. The water supplier for the wholesale system must also meet the requirements of subsection (6)(j) of this rule.¶

(j) Five additional samples must be collected from the same source within 24 hours of notification of an E. coli-positive sample collected as prescribed by paragraph (6)(i)(A) or (6)(k) of this rule at a groundwater source and not invalidated according to subsection (6)(l) of this rule if the Authority does not require corrective action as prescribed by OAR 333-061-0032(6).¶

(k) At groundwater systems where chlorine, UV, or another oxidant is used for disinfection, but where 4-log inactivation of viruses is not achieved, assessment monitoring must be conducted at the groundwater source to determine the potential for viral contamination.¶

(A) Assessment monitoring according to this subsection must include the collection of at least one sample from each groundwater source every year. The Authority may grant written approval to conduct monitoring at one or more representative groundwater sources within a water system that draw water from the same hydrogeologic setting.¶

(B) A sample collected according to paragraph (6)(i)(A) of this rule or a sample collected for GWUDI determination according to OAR 333-061-0032(7) may be used to meet the requirements of this subsection.¶

(C) Additional Source Water Assessment Monitoring.¶

(i) The Authority may require additional source water assessment monitoring if at least one of the following conditions occur:¶

(I) At least one total coliform-positive sample was collected from the groundwater source;¶

(II) A groundwater source having been determined by the Authority to be susceptible to fecal contamination through a Source Water Assessment (or equivalent hydrogeologic assessment wherein susceptibility is defined as a result of a highly sensitive source due to aquifer characteristics, vadose zone characteristics, monitoring history, or well construction) and the presence of a fecal contaminant source within the two-year TOT zone, outreach area, or zone one area;¶

(III) A source that draws water from an aquifer that the Authority has identified as being fecally contaminated;¶

(IV) A determination by a source water assessment or equivalent hydrogeologic analysis that the groundwater source is highly sensitive, and that the source is located within an area that has a high density of underground injection control wells; or¶

(V) Other criteria at the discretion of the Authority.¶

(ii) Requirements for additional source water assessment monitoring include, but are not limited to:¶

(I) Collecting 12 consecutive monthly groundwater source samples for water systems that operate year-round, or monthly samples that represent each month the water system provides groundwater to the public for water systems that operate seasonally;¶

(II) Collecting a standard sample volume of at least 100 mL for E. coli analysis regardless of the analytical method used;¶

(III) Analysis of all samples for the presence of E. coli, using an analytical method as prescribed by section (1) of this rule;¶

(IV) Collecting samples at a location prior to any treatment unless the Authority approves a sampling location after treatment; and¶

(V) Collecting samples at the groundwater source, unless the water system's configuration does not allow for raw water sampling and the Authority approves an alternate sampling location that is representative of the water quality of that groundwater source.¶

(D) The Authority may require a groundwater source to be re-evaluated as prescribed by this subsection if geologic conditions, source pumping conditions, or fecal contaminant source conditions change over time.¶

(I) The Authority may invalidate an E. coli-positive groundwater source sample collected according to subsections (6)(i), (j) or (k) of this rule only under the following conditions:¶

(A) The water supplier or laboratory notifies the Authority in writing that improper sample analysis occurred; or¶

(B) The Authority determines and documents in writing that there is substantial evidence that an E. coli -positive sample is not related to source water quality.¶

(m) If the Authority invalidates an E. coli -positive groundwater source sample according to subsection (6)(l) of this rule, the water supplier must collect another source water sample as prescribed by subsection (6)(i) of this rule within 24 hours of being notified of the invalidation. The Authority may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the Authority must specify how much time the system has to collect the sample.¶

(n) The Authority may direct a water supplier to conduct source water assessment monitoring as prescribed by subsection (6)(k) of this rule when a new groundwater source is placed into service. Monitoring as prescribed by this subsection must begin before the groundwater source is used to provide water to the public.¶

(o) The Authority may require a water supplier to provide any existing information that will enable the Authority

to perform an assessment to determine whether the groundwater system obtains water from a hydrogeologically sensitive aquifer.¶

(p) Monitoring violations.¶

(A) Failure to collect every required routine or additional routine sample in a compliance period is a violation of this rule.¶

(B) Failure to analyze for E. coli following a total coliform-positive routine sample is a violation of this rule.¶

(q) Every water system must undergo a sanitary survey at least every five years at a frequency determined by the authority. The Authority will review the results of each survey to determine whether the existing monitoring frequency is adequate and what additional measures, if any, the water supplier needs to undertake to improve drinking water quality.¶

(r) For any samples collected or analyzed for coliform bacteria on March 31, 2016 or earlier or for any repeat samples collected or analyzed for coliform bacteria after March 31, 2016 in response to a positive sample collected on March 31, 2016 or earlier, the provisions of 40 CFR 141.21(b), (c), (e), (f) and (g) apply to processing and analysis of that sample.¶

(7) Radionuclides:¶

(a) Gross alpha particle activity, Radium 226, Radium 228, and Uranium:¶

(A) Initial Monitoring. Community Water Systems without acceptable historical data, as defined below, must conduct initial monitoring to determine compliance with OAR 333-061-0030(5).¶

(i) At new water systems or systems using a new source, water suppliers must conduct initial monitoring in the first quarter of operation, followed by three consecutive quarterly samples.¶

(ii) The Authority may waive the final two quarters of the initial monitoring at an entry point if the results of the samples from the first two quarters are below the method detection limit.¶

(iii) Grandparenting of historical data. A system may use monitoring data from each source or entry point collected between June 2000 and December 8, 2003 to satisfy the initial monitoring requirements.¶

(iv) If the average of the initial monitoring results for a sampling point is above the MCL, the system must collect and analyze quarterly samples at the entry point until the system has results from four consecutive quarters that are at or below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the Authority.¶

(B) Reduced Monitoring. Radionuclide monitoring may be reduced to once every three years, once every six years, or once every nine years based on the following criteria:¶

(i) If the average of the initial monitoring result for each contaminant (gross alpha particle activity, radium-226, radium-228, and uranium) at a given entry point is below the detection limit, sampling for that contaminant may be reduced to once every nine years.¶

(ii) For gross alpha particle activity, combined radium 226 and radium 228, and uranium, if the average of the initial monitoring results is at or above the detection limit but at or below one-half the MCL, sampling for that contaminant may be reduced to once every six years.¶

(iii) For gross alpha particle activity, combined radium 226 and radium 228, and uranium, if the average of the initial monitoring results is above one-half the MCL but at or below the MCL, the system must collect one sample at that sampling point at least once every three years.¶

(iv) Systems must use the samples collected during the reduced monitoring period to determine the monitoring frequency for subsequent monitoring periods.¶

(v) If a system has a monitoring result that exceeds the MCL while on reduced monitoring, the system must collect and analyze quarterly samples at that entry point until the system has results from four consecutive quarters that are below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the Authority.¶

(vi) A water system with two or more wells that have been determined to constitute a "wellfield" as specified in subsection (1)(k) of this rule may reduce sampling to only those entry point(s) designated by the Authority.¶

(C) Compositing of samples. A system may composite up to four consecutive quarterly samples from a single entry point if the analysis is done within a year of the first sample. If the analytical result from the composited sample is greater than one-half the MCL, the Authority may direct the system to take additional quarterly samples before allowing the system to sample under a reduced monitoring schedule.¶

(D) Substitution of results.¶

(i) A gross alpha particle activity measurement may be substituted for the required radium-226 measurement if the gross alpha particle activity does not exceed 5 pCi/L.¶

(ii) A gross alpha particle activity measurement may be substituted for the required uranium measurement if the gross alpha particle activity does not exceed 15 pCi/L.¶

(iii) The gross alpha measurement shall have a confidence interval of 95 percent (1.65 where one-half is the standard deviation of the net counting rate of the sample) for radium-226 and uranium.¶

(iv) When a system uses a gross alpha particle activity measurement in lieu of a radium-226 or uranium

measurement, the gross alpha particle activity analytical result will be used to determine the future monitoring frequency for radium-226 or uranium. If the gross alpha particle activity result is less than detection, half the method detection limit will be used to determine compliance and the future monitoring frequency.¶

(b) Beta particle and photon radioactivity:¶

(A) Community water systems designated by the Authority as "vulnerable" must sample for beta particle and photon radioactivity as follows. No waivers shall be granted.¶

(i) Quarterly samples for beta emitters and annual samples for tritium and strontium-90 must be taken at each entry point to the distribution system. Systems already designated by the state must continue to sample until the state removes the designation.¶

(ii) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sample point has a running annual average less than or equal to 50 pCi/l, sampling for contaminants prescribed in subparagraph (7)(b)(A)(i) of this rule maybe reduced to once every three years.¶

(B) Community water systems designated by the Authority as "contaminated" by effluents from nuclear facilities and must sample for beta particle and photon radioactivity as follows. No waivers shall be granted.¶

(i) Systems must collect quarterly samples for beta emitters as detailed below and iodine-131 and annual samples for tritium and strontium-90 at each entry point to the distribution system. Sampling must continue until the Authority removes the designation.¶

(ii) Quarterly monitoring for gross beta particle activity is based on the analysis of monthly samples or the analysis of a composite of three monthly samples.¶

(iii) For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. More frequent monitoring may be required if iodine-131 is detected.¶

(iv) Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples.¶

(v) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at an entry point has a running annual average less than or equal to 15 pCi/l, the Authority may reduce the frequency of monitoring for contaminants prescribed in subparagraph (7)(b)(B)(i) of this rule at that entry point to every three years.¶

(C) For systems in the vicinity of a nuclear facility, the Authority may allow the substitution of appropriate environmental surveillance data taken in conjunction with operation of a nuclear facility for direct monitoring of man-made radioactivity by the water supplier where such data is applicable to a particular Community water system. In the event of a release, monitoring must be done at the water system's entry points.¶

(D) Systems may analyze for naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity analysis. Systems are allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level is exceeded. The potassium-40 beta particle activity must be calculated by multiplying elemental potassium concentrations (in mg/l) by a factor of 0.82.¶

(E) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds the screening level, an analysis of the sample must be performed to identify the major radioactive constituents present in the sample and the appropriate doses must be calculated and summed to determine compliance with OAR 333-061-0030(5). Doses must also be calculated and combined for measured levels of tritium and strontium to determine compliance.¶

(F) Systems must monitor monthly at the entry point(s) which exceed the MCL listed in OAR 333-061-0030(5) beginning the month after the exceedance occurs. Systems must continue monthly monitoring until the system has established, by a rolling average of three monthly samples, that the MCL is being met. Systems who establish that the MCL is being met must return to quarterly monitoring until they meet the requirements set forth in subparagraph (7)(b)(A)(ii) or (7)(b)(B)(v) of this rule.¶

(c) General monitoring and compliance requirements for radionuclides.¶

(A) The Authority may require more frequent monitoring than specified in subsections (7)(a) and (b) of this rule, or may require confirmation samples at its discretion. The results of the initial and confirmation samples will be averaged for use in compliance determinations.¶

(B) Each system shall monitor at the time designated by the Authority during each compliance period. To determine compliance with 333-061-0030(5), averages of data shall be used and shall be rounded to the same number of significant figures as the MCL of the contaminant in question.¶

(C) Compliance.¶

(i) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point. If the average of any sampling point is greater than the MCL, then the system is out of compliance with the MCL.¶

(ii) For systems monitoring more than once per year, if any sample result will cause the running average to exceed the MCL at any entry point, the system is out of compliance with the MCL immediately.¶

- (iii) Systems must include all samples taken and analyzed under the provisions of this section in determining compliance, even if that number is greater than the minimum required.¶
- (iv) If a system does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.¶
- (v) If a sample is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 or uranium. In that case, if the gross alpha particle activity result is less than detection, one-half the detection limit will be used to calculate the annual average.¶
- (D) The Authority has the discretion to delete results of obvious sampling or analytical errors.¶
- (E) When the average annual MCL for radionuclides as specified in Table 5 is exceeded, the water supplier shall, within 48 hours, report the analysis results to the Authority as prescribed in OAR 333-061-0040 and initiate the public notification procedures prescribed in 333-061-0042(2)(b)(A).¶
- (8) Secondary contaminants:¶
  - (a) The levels listed in Table 6 of OAR 333-061-0030 represent reasonable goals for drinking water quality, but routine sampling for these secondary contaminants is not required.¶
  - (b) The Authority may however, require sampling and analysis under the following circumstances:¶
    - (A) User complaints of taste, odor or staining of plumbing fixtures.¶
    - (B) Where treatment of the water is proposed and the levels of secondary contaminants are needed to determine the method and degree of treatment.¶
    - (C) Where levels of secondary contaminants are determined by the Authority to present an unreasonable risk to health.¶
  - (c) If the results of the analyses do not exceed levels for secondary contaminants, listed in Table 6 of OAR 333-061-0030, subsequent sampling and analysis shall be at the discretion of the Authority.¶
  - (d) If the results of the analyses indicate that the levels for secondary contaminants, listed in Table 6 of OAR 333-061-0030 are exceeded, the Authority shall determine whether the contaminant levels pose an unreasonable risk to health or interfere with the ability of a water treatment facility to produce a quality of water complying with the MCLs of these rules and specify follow-up actions to be taken.¶
  - (e) During the period while any measures called for in subsection (8)(d) of this rule are being implemented, the water supplier shall follow the procedures relating to variances and permits which are prescribed in OAR 333-061-0045.¶
- (9) Monitoring of disinfectant residuals in the distribution system:¶
  - (a) All public water systems that add a disinfectant to the water supply at any point in the treatment process, or deliver water in which a disinfectant has been added to the water supply, must maintain a detectable disinfectant residual throughout the distribution system and shall measure and record the residual:¶
    - (A) At one or more representative points at a frequency that is sufficient to detect variations in chlorine demand and changes in water flow but in no case less often than twice per week; and¶
    - (B) At the same points in the distribution system and at the same times as total coliforms are sampled as prescribed by subsections (6)(b) through (6)(f) of this rule.¶
  - (b) The Authority may allow a water supplier to collect disinfectant residual samples as specified in paragraph (9)(a)(B) of this rule at points other than the total coliform sampling points at public water systems which use both a surface water source or GWUDI source and a groundwater source, if the Authority determines that such points are more representative of treated (disinfected) water quality within the distribution system. At water systems where surface water or GWUDI is used, the results of residual disinfectant concentration sampling conducted as prescribed by subsection (5)(a) of this rule for unfiltered systems or subsection (5)(b) of this rule for systems which filter, may be used in lieu of collecting separate samples.¶
  - (c) All public water systems that add chlorine for any purpose must ensure that the chlorine residual entering the distribution system after treatment is less than 4.0 mg/l.¶
  - (d) The Authority may waive the monitoring requirements specified in subsection (9)(a) of this rule for water systems that add chlorine for purposes such as the oxidation of metals or taste and odor control if a water system measures and records the residual daily and verifies that there is no remaining disinfectant residual at or before the first customer.¶
  - (e) Where chlorine is used as the disinfectant, the measurement of residual chlorine shall be by the DPD or other EPA-approved method in accordance with Standard Methods for the Examination of Water and Waste-water, and shall measure the free chlorine residual or total chlorine residual as applicable;¶
  - (f) The water supplier shall maintain a summary report of the residual disinfectant measurements and shall retain this summary report at a convenient location within or near the area served by the water system.¶
- (10) Lead and copper monitoring at community and NTNC water systems:¶
  - (a) Site selection criteria for lead and copper monitoring in tap water.¶
    - (A) Water suppliers must complete a materials evaluation of the distribution system at every water system to which this section applies in order to identify a pool of targeted sampling sites that meet the requirements of this

subsection. The sample sites identified must be sufficient to ensure the number of tap water samples required by subsection (10)(c) of this rule can be collected every monitoring period. All sample sites from which first draw samples are collected must 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) Water suppliers must review the sources of information listed in this paragraph to identify a sufficient number of sampling sites but may consider additional information if approved by the Authority.¶

(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 water distribution system; and¶

(ii) All existing water quality information, which includes the results of all prior analyses at the water system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations.¶

(C) The sampling sites selected for a community water system's sampling pool must consist of buildings constructed as single-family residences that are used as either a residence or a place of business and that contain copper pipes with lead solder installed from January 1, 1983 through June 30, 1985 or are buildings served by lead pipes, lead goosenecks or similar appurtenances. When multiple-family residences comprise at least 20 percent of the structures served by a water system, the water supplier may include these types of structures in the sampling pool. These sample sites constitute tier 1 sampling sites.¶

(D) At community water systems with insufficient tier 1 sampling sites to satisfy the monitoring requirements in subsection (10)(c) of this rule, water suppliers must complete the sampling pool with sample sites at buildings, including multiple-family residences that contain copper pipes with lead solder installed from January 1, 1983 through June 30, 1985 or at buildings served by lead pipes, lead goosenecks or similar appurtenances. These sample sites constitute tier 2 sampling sites.¶

(E) At community water systems with insufficient tier 1 and tier 2 sampling sites, water suppliers must complete the sampling pool with sample sites at single family structures that contain copper pipes with lead solder installed before 1983. These sample sites constitute tier 3 sampling sites.¶

(F) At community water systems with insufficient tier 1, tier 2 and tier 3 sampling sites to satisfy the monitoring requirements in subsection (10)(c) of this rule, water suppliers must complete the sampling pool with representative sites throughout the distribution system at which the plumbing materials used at that site are commonly found at other sites served by the water system.¶

(G) The sampling sites selected for NTNC water systems must consist of buildings that contain copper pipes with lead solder installed from January 1, 1983 through June 30, 1985 or sample sites served by lead pipes, lead goosenecks or similar appurtenances. These sample sites constitute tier 1 sampling sites for NTNC water systems.¶

(H) At NTNC water systems with insufficient tier 1 sites, water suppliers must complete the sampling pool with sites that meet the criteria specified in paragraph (10)(a)(D) of this rule or if necessary, complete the sampling pool with sites served by copper pipes with lead solder installed before 1983. If additional sites are still needed to satisfy the monitoring requirements in subsection (10)(c) of this rule, the water supplier shall use representative sites throughout the distribution system with plumbing materials commonly found at other sites served by the water system.¶

(I) For any water system where the sampling pool does not consist exclusively of tier 1 sites, water suppliers must submit a letter to the Authority according to OAR 333-061-0040(1)(g)(A)(i) indicating why a review of the information in subparagraph (10)(a)(B) of this rule was inadequate to locate a sufficient number of tier 1 sites. For community water systems which include tier 3 sampling sites in the sampling pool, water suppliers must indicate in such a letter why a sufficient number of tier 1 and tier 2 sampling sites could not be located.¶

(b) Sample collection methods for lead and copper monitoring in tap water.¶

(A) All tap water samples for lead and copper collected according to subsections (10)(a) through (e) of this rule must be first draw samples consisting of a one-liter sample collected from a tap where the water remained in plumbing pipes for at least six hours and must be collected without flushing the tap first. First-draw samples from residential housing must be collected from the cold-water kitchen tap or bathroom sink. First-draw samples from non-residential buildings must be collected at an interior tap from which water is typically drawn for consumption. First-draw samples may be collected by the water supplier or by residents but only after those residents were instructed of the sampling procedures specified in this paragraph. To avoid the risks associated with residents handling nitric acid, acid fixation of first draw samples may be done up to 14 days after a sample is collected. If a water supplier allows residents to perform sampling, the water supplier may not challenge the accuracy of sampling results based on alleged errors in sample collection.¶

(B) Water suppliers must collect each first-draw tap sample from the same sampling site from which a previous sample was collected. If a water supplier cannot gain access to a sampling site in order to collect a follow-up tap sample for any reason, the water supplier may collect the follow-up tap sample from another sampling site in the

sampling pool as long as the new sample site meets the same targeting criteria and is within the proximity of the original site.¶

(c) Water suppliers must collect at least the number of samples indicated in this subsection during each monitoring period according to subsection (10)(d) of this rule. The sample sites selected for reduced monitoring must be representative of the sites identified as standard monitoring sampling sites.¶

(A) At water systems with fewer than five drinking water taps meeting the sample site criteria specified in subsection (10)(a) of this rule, water suppliers must collect at least one sample from each sampling site and must then collect additional samples on different days during the monitoring period to meet the required number of samples during the monitoring period.¶

(B) The Authority may allow water suppliers to collect a number of samples less than the number of sampling sites specified in this subsection provided that at least one sample is collected at every tap that can be used for human consumption. The Authority must approve this reduction of the minimum number of samples in writing based on a request from the water supplier or onsite verification by the Authority. The Authority may specify sampling locations when a system is conducting reduced monitoring.¶

Number of People Served by the Water System - Number of Standard Monitoring Sites¶

>100,000 - 100¶

10,001 to 100,000 - 60¶

3,301 to 10,000 - 40¶

501 to 3,300 - 20¶

101 to 500 - 10¶

d100 - 5¶

Number of People Served by the Water System - Number of Reduced Monitoring Sites¶

>100,000 - 50¶

10,001 to 100,000 - 30¶

3,301 to 10,000 - 20¶

501 to 3,300 - 10¶

101 to 500 - 5¶

d100 - 5¶

(d) Frequency of monitoring for lead and copper in tap water.¶

(A) At all water systems, water suppliers must conduct initial tap water monitoring during two consecutive six-month periods.¶

(i) At water systems serving 50,000 people or less, if sample results are at or below the lead and copper action levels during two consecutive six-month monitoring periods, water suppliers may reduce monitoring according to paragraph (10)(d)(D) of this rule.¶

(ii) At water systems serving 50,000 people or less, if sample results exceed the action level for lead or copper, water suppliers must implement corrosion control treatment according to OAR 333-061-0034(2) and monitor according to paragraphs (10)(d)(B) and (C) of this rule.¶

(B) Monitoring after installation of corrosion control and source water treatment.¶

(i) At any water system where optimal corrosion control treatment is installed according to OAR 333-061-0034(3), water suppliers must monitor during two consecutive six-month periods no later than 12 months after the deadline for installing treatment.¶

(ii) At any water system where source water treatment is installed according to OAR 333-061-0034(4), water suppliers must monitor during two consecutive six-month periods no later than 12 months after the deadline for installing treatment.¶

(C) After the Authority specifies water quality parameters for optimal corrosion control according to OAR 333-061-0034(3), water suppliers must monitor during each subsequent six-month monitoring period beginning on the date the Authority specifies the optimal water quality control parameters.¶

(D) Reduced monitoring:¶

(i) At water systems where sample results are at or below the lead and copper action levels during each of two consecutive six-month monitoring periods, water suppliers may reduce both the number of samples according to paragraph (10)(c)(B) of this rule and the monitoring frequency to once per year. In no case may the number of samples required be reduced below the minimum number specified in paragraph (10)(c)(B) of this rule or at least one sample per available tap. This monitoring must begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.¶

(I) At water systems with optimal corrosion control treatment, monitoring may be reduced only if the range of optimal water quality control parameters specified by the Authority are met and after written approval from the Authority.¶

(II) At water systems with optimal corrosion control treatment, the Authority shall review monitoring, treatment, and other relevant information submitted by the water supplier and notify the water supplier in writing when it

determines the reduced monitoring may begin. The Authority shall review, and where appropriate, revise its determination when the water supplier submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.¶

(ii) At water systems where sample results are at or below the lead and copper action levels during three consecutive years of monitoring, water suppliers may reduce the monitoring frequency for lead and copper to once every three years.¶

(I) At water systems with optimal corrosion control treatment, monitoring may be reduced only if the range of optimal water quality control parameters specified by the Authority are met and after written approval from the Authority.¶

(II) The Authority shall review monitoring, treatment, and other relevant information submitted by the water supplier and shall notify the water supplier in writing when it determines monitoring once every three years may begin. The Authority shall review, and where appropriate, revise its determination when the water supplier submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.¶

(III) Monitoring conducted once every three years must be completed no later than every third calendar year.¶

(iii) At water systems where the required number of samples is reduced, water suppliers must collect the samples from representative sites included in the pool of targeted sampling sites identified according to subsection (10)(a) of this rule. At systems where monitoring is annual or less frequent, water suppliers must conduct the lead and copper tap sampling between June 1 and September 30, inclusive. For water suppliers collecting a reduced number of samples, the Authority may approve a different seasonal period for lead and copper tap water monitoring. Such a seasonal period shall be no longer than four consecutive months and must represent a time of normal operation, when the highest concentrations of lead are most likely to occur.¶

(I) At a NTNC water system which is not operated during the months of June through September and for which a period of normal operation is unknown where the highest concentrations of lead are most likely to occur, the Authority shall designate a monitoring period that represents a time of normal operation for the water system. This monitoring shall begin during the period designated by the Authority in the calendar year immediately following the end of the monitoring period for which samples were collected at the water system.¶

(II) At community and NTNC water systems where monitoring is annual or less frequent and the Authority approved sample collection during the months of June through December, water suppliers must collect the next round of samples during a time period that ends no later than 21 months or 45 months respectively, after the previous round of sampling. Subsequent rounds of sampling must be collected annually or triennially.¶

(iv) At water systems subject to reduced monitoring and serving 50,000 people or less, if lead or copper samples exceed the action level, water suppliers must resume monitoring at the frequency specified in paragraph (10)(d)(A) of this rule and collect the number of samples specified for standard monitoring specified in subsection (10)(c) of this rule. Water suppliers must also monitor water quality parameters according to subsection (10)(f) of this rule during the period in which the lead or copper action level was exceeded.¶

(I) At water systems where monitoring was increased according to subparagraph (10)(d)(D)(iv) of this rule, water suppliers may resume annual tap water monitoring for lead and copper according to subparagraph (10)(d)(D)(i) of this rule at the reduced number of sampling sites after two subsequent consecutive six-month rounds of lead and copper sample results are at or below the applicable action levels. This annual monitoring must begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.¶

(II) Water suppliers may resume triennial monitoring for lead and copper in tap water at the reduced number of sampling sites after meeting the criteria specified in subparagraph (10)(d)(D)(ii) of this rule.¶

(v) At water systems subject to reduced monitoring, if sample results exceed the lead action level during any four-month monitoring period or if optimal water quality control parameters are not at or above the minimum values or within the range of values specified by the Authority for more than nine days in any six-month period as specified in subparagraph (10)(f)(F), water suppliers must complete the actions specified in sub-subparagraphs (10)(d)(D)(v)(I) through (III) of this rule:¶

(I) Resume monitoring at the frequency specified in paragraph (10)(d)(A) of this rule.¶

(II) Collect the number of samples specified for standard monitoring specified in subsection (10)(c) of this rule; and¶

(III) Resume monitoring for water quality parameters within the distribution system, if applicable, according to paragraph (10)(f)(C) of this rule.¶

(IV) This monitoring must begin no later than the six-month monitoring period beginning January 1 of the calendar year following the lead action level exceedance or water quality parameter excursion.¶

(vi) At water systems where monitoring was increased according to subparagraph (10)(d)(D)(v) of this rule, water suppliers may resume both reduced tap water monitoring for lead and copper and reduced water quality parameter monitoring within the distribution system if the Authority approves the monitoring reduction in writing and after two subsequent six-month rounds of lead and copper monitoring met the criteria specified in

subparagraph (10)(d)(D)(i) of this rule.¶

(I) This annual monitoring must begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.¶

(II) At such water systems, water suppliers may resume reduced triennial monitoring for lead and copper in tap water after meeting the criteria specified in specified in subparagraph (10)(d)(D)(ii) of this rule. Water suppliers may also reduce water quality parameter distribution monitoring according to sub-subparagraph (10)(f)(F)(vi)(I) and (II) of this rule.¶

(III) Water suppliers must demonstrate they have re-qualified for triennial monitoring for water quality parameters in distribution before beginning this monitoring.¶

(vii) At water systems where sample results are less than or equal to 0.005 mg/l for lead and 0.65 mg/l for copper when calculated according to OAR 333-061-0030(1) for two consecutive six-month monitoring periods, water suppliers may reduce the number of samples according to subsection (10)(c) of this rule and the sampling frequency to once every three calendar years.¶

(viii) At water systems subject to reduced monitoring according to (10)(d)(D) of this rule, water suppliers must notify the Authority in writing of any upcoming, long-term change to treatment practices or the addition of a new water source. The Authority shall review and approve the addition of the source or change in treatment practices before the project is implemented by the water supplier. The Authority may require the water supplier to resume standard monitoring or take other appropriate steps to evaluate water quality such as increased water quality parameter monitoring or re-evaluation of its corrosion control treatment.¶

(e) The results of any monitoring conducted in addition to the requirements of this section must be considered by the water supplier and by the Authority when determining whether an action level is exceeded or in making any determinations. The Authority may invalidate lead or copper tap water samples according to the criteria in this subsection.¶

(A) The Authority may invalidate a lead or copper tap water sample if at least one of the conditions specified in this paragraph is met. The decision and the rationale for the decision shall be documented in writing by the Authority. A sample invalidated by the Authority does not count toward determining if the action level for lead or copper is exceeded or toward meeting the minimum monitoring requirements. Sample results may be invalidated if:¶

(i) The laboratory establishes that improper sample analysis caused erroneous results;¶

(ii) The sampling site did not meet the site selection criteria;¶

(iii) The sample container was damaged in transit; or¶

(iv) There is substantial reason to believe that the sample was subject to tampering.¶

(B) Water suppliers must report the results of all samples to the Authority and all supporting documentation for samples proposed to be invalidated.¶

(C) The Authority may not invalidate a sample solely on the grounds that a follow-up sample result is higher or lower than that of the original sample.¶

(D) Water suppliers must collect replacement samples for any samples invalidated if after the invalidation of one or more samples, the number of samples collected for the monitoring period does not meet the minimum requirements specified in subsection (10)(c) of this rule. Replacement samples must be collected as soon as possible, and in no case later than 20 days after the date the Authority invalidates the original sample.

Replacement samples must be collected at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the monitoring period.¶

(f) Water suppliers must monitor water quality parameters as specified in paragraphs (10)(f)(D) through (J) of this rule as applicable at:¶

(A) Water systems serving more than 50,000 people;¶

(B) Water systems serving 50,000 people or less where the lead or copper action levels were exceeded; or¶

(C) Water systems where optimal corrosion control treatment is operated.¶

(D) Sample collection methods:¶

(i) Distribution samples must be representative of water quality throughout the distribution system taking into account the number of people served by the water system, different sources of water, different treatment methods employed at the system, and seasonal variability. Water quality parameter monitoring is not required to be conducted at taps targeted for lead and copper monitoring.¶

(ii) Entry point samples must be collected at locations representative of each source after treatment. If a water system draws water from more than one source and the sources are combined before distribution, water suppliers must monitor at an entry point to the distribution system during periods of normal operating conditions when water is representative of all sources being used.¶

(E) Number of samples:¶

(i) Water suppliers must collect two distribution samples for applicable water quality parameters during each monitoring period as specified in paragraphs (10)(f)(F) through (H) of this rule from the following number of sites.¶  
Number of people served by the water system - Number of sample locations¶



- >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¶

(ii) Water suppliers must collect two samples for each applicable water quality parameter at each entry point to the distribution system during each monitoring period specified in subparagraph (10)(f)(F) of this rule except as provided in subparagraph (10)(f)(G)(iii) of this rule. During each monitoring period specified in paragraphs (10)(f)(G) through (I) of this rule, water suppliers must collect one sample for each applicable water quality parameter at each entry point to the distribution system.¶

(F) Water suppliers must monitor water quality parameters in the distribution system and at each entry point to the distribution system at water systems as prescribed by subparagraphs (10)(f)(F)(i) or (ii) of this rule. Monitoring must be conducted during each six-month monitoring period for the following parameters: pH, alkalinity, orthophosphate (when an inhibitor containing a phosphate compound is used), silica (when an inhibitor containing a silicate compound is used), calcium, conductivity, and water temperature. This monitoring must be conducted:¶

- (i) At water systems serving 50,000 people or less, if sample results exceed the lead or copper action level; or¶
- (ii) At water systems serving 50,000 people or more or where a water system grows to serve more than 50,000 people.¶

(G) At water systems where optimal corrosion control treatment is installed, water suppliers must monitor water quality parameters at the locations and frequencies specified in this paragraph during each six-month monitoring period as specified in paragraph (10)(d)(B) of this rule.¶

(i) At taps in the distribution system, two samples for: pH, alkalinity, orthophosphate (when an inhibitor containing a phosphate compound is used), silica (when an inhibitor containing a silicate compound is used), calcium (when calcium carbonate stabilization is used as part of corrosion control).¶

(ii) At each entry point to the distribution system, at least one sample for pH, no less frequently than every two weeks except as specified in subparagraph (10)(f)(G)(iii) of this rule. Monitoring must also include if applicable:¶

- (I) The alkalinity concentration and the dosage rate of the chemical used to adjust alkalinity when alkalinity is adjusted as part of optimal corrosion control; or¶
- (II) The concentration of orthophosphate or silica (whichever is applicable) and the dosage rate of the inhibitor used when a corrosion inhibitor is used as part of optimal corrosion control.¶

(iii) At groundwater systems, water suppliers may limit entry point monitoring to those entry points that are representative of water quality and treatment conditions throughout the distribution system. If water from untreated ground water sources mixes with water from treated ground water sources, the water supplier must monitor water quality parameters both at representative entry points receiving treatment and no treatment. Water suppliers must provide the Authority written information identifying the selected entry points and documentation, including information about seasonal variability sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system, prior to any monitoring.¶

(H) Monitoring after the Authority specifies water quality parameter values for optimal corrosion control treatment.¶

(i) At water systems serving more than 50,000 people where the Authority specifies water quality parameter values for optimal corrosion control according to OAR 333-061-0034(3)(I), water suppliers must monitor the applicable water quality parameters specified in paragraph (10)(f)(G) of this rule every six months. Water suppliers must also determine compliance with the minimum optimal water quality parameter values set by the Authority every six months, beginning with the first six-month period on either January 1 or July 1, whichever comes first, after the Authority specifies the values. Compliance with the Authority-designated optimal water quality parameter values must be determined according to OAR 333-061-0034(3)(I).¶

(ii) At water systems serving 50,000 people or less where the Authority specifies water quality parameter values for optimal corrosion control according to OAR 333-061-0034(3)(I), water suppliers must monitor the applicable water quality parameters according to paragraphs (10)(f)(G) or (I) of this rule as appropriate. Water suppliers must also monitor water quality parameters during each six-month monitoring period where sample results exceed the action level for lead or copper.¶

(I) Reduced monitoring:¶

(i) At water systems where the range of water quality parameter values for optimal corrosion control treatment are met during two consecutive six-month monitoring periods conducted according to subsection (10)(d) of this rule, water suppliers may collect two distribution samples for the applicable water quality parameters at the reduced number of sites specified in this subparagraph during each six-month monitoring period. The monitoring frequency at the entry point(s) to the distribution system must continue as specified in paragraph (10)(f)(G) of this rule.¶

Number of People Served by the Water System - Reduced Number of Sample Sites¶

>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¶

(ii) At water systems where the range of water quality parameter values for optimal corrosion control treatment are met during every six-month monitoring period for three consecutive years, water suppliers may reduce the monitoring frequency for water quality parameters in distribution to annually. This monitoring must begin during the calendar year immediately following the end of the monitoring period in which the third consecutive year of six-month monitoring occurs.¶

(iii) At water systems where the range water quality parameter values for optimal corrosion control treatment are met during three consecutive years of annual monitoring, water suppliers may reduce the monitoring frequency for water quality parameters in distribution from annually to once every three years. This monitoring must begin no later than the third calendar year following the end of the monitoring period in which the third consecutive year of annual monitoring occurred.¶

(iv) Water suppliers may reduce the monitoring frequency for applicable water quality parameters in distribution to once every three years if able to demonstrate that the lead concentration in tap water is less than or equal to 0.005 mg/l, that the copper concentration in tap water is less than or equal to 0.65 mg/l, and that the range of water quality parameter values for optimal corrosion control treatment were met during two consecutive monitoring periods conducted according to subsection (10)(d) of this rule. Monitoring must be conducted at least once every third calendar year.¶

(v) Water suppliers monitoring annually must collect samples evenly throughout the year to reflect seasonal variability in water quality.¶

(vi) At water systems where reduced monitoring is conducted, water suppliers that fail to operate optimal corrosion control treatment within the range of values specified by the Authority according to OAR 333-061-0034(3)(I) for more than nine days during any six-month period must resume distribution monitoring at the number of locations and frequency prescribed by paragraph (10)(f)(H) of this rule. Water suppliers may resume annual monitoring for water quality parameters in distribution at the reduced number of sites after completing two subsequent consecutive six-month rounds of monitoring that meet the criteria specified in subparagraph (10)(f)(I)(i) of this rule.¶

(J) The results of any monitoring conducted in addition to the minimum requirements specified in this section shall be considered by the water supplier and the Authority in making any determinations.¶

(g) Monitoring requirements for lead and copper in source water.¶

(A) At water systems where the action level for either lead or copper is exceeded in tap water samples collected according to subsections (10)(a) through (e) of this rule, water suppliers must collect lead and copper source water samples as specified in this subsection.¶

(i) At groundwater systems, water suppliers must collect at least one sample at every entry point to the distribution system which is representative of each source after treatment unless conditions make a different sampling point more representative of each source or water treatment plant.¶

(ii) At surface water systems or water systems with a combination of groundwater and surface water sources, water suppliers must collect at least one sample at every 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. Water suppliers must collect each sample at equivalent sampling points unless conditions make another sampling point more representative of each source or water treatment plant.¶

(iii) If a water system draws water from more than one source and the sources are combined before distribution, water suppliers must monitor at an entry point to the distribution system during periods when water is representative of all sources being used.¶

(B) Where the results of sampling indicate the maximum permissible source water level established in OAR 333-061-0034(4)(b)(D) is exceeded, the Authority may require one additional sample to be collected as soon as possible after the initial sample was collected (but not to exceed two weeks) at the same sampling point. If an Authority-required confirmation sample is collected, the results of the initial and confirmation samples must be averaged to determine compliance with the Authority-specified maximum permissible levels. Any sample value below the detection limit shall be considered to be zero. For lead, any value above the detection limit but below the practical quantitation level (PQL) of 0.005 mg/l shall either be considered as the measured value or be considered one-half the PQL (0.0025 mg/l). For copper, any value above the detection limit but below the PQL of 0.050 mg/l shall either be considered as the measured value or be considered one-half the PQL (0.025 mg/l).¶

(C) Water suppliers must collect one sample according to paragraph (10)(g)(A) of this rule no later than six months

after the end of the monitoring period during which the lead or copper action level was exceeded. For monitoring periods that are annual or less frequent, the end of the monitoring period is September 30 of the calendar year in which the monitoring occurred, or if the Authority has established an alternate monitoring period, the last day of that period.¶

(D) At water systems where source water treatment was installed according to OAR 333-061-0034(4)(a)(C), water suppliers must collect at least one sample from each entry point to the distribution system during two consecutive six-month monitoring periods within 36 months after the Authority determines source water treatment is necessary.¶

(E) Monitoring frequency after the Authority specifies maximum permissible source water levels or determines that source water treatment is not needed.¶

(i) Water suppliers must monitor at the frequency specified in this paragraph in cases where the Authority specifies maximum permissible source water levels according to OAR 333-061-0034(4)(b)(D) or determines that source water treatment is not required according to OAR 333-061-0034(4)(b)(B).¶

(I) At water systems using only groundwater sources, water suppliers must collect samples once during the three-year compliance period in effect when the applicable Authority determination is made and thereafter water suppliers must collect samples once every third calendar year.¶

(II) At water systems using surface water or a combination of groundwater and surface water sources, water suppliers must collect samples once during each calendar year, with the first annual monitoring period beginning during the year in which the applicable Authority determination is made.¶

(ii) Water suppliers are not required to conduct source water monitoring if sample results are at or below the action level for lead and copper in tap water samples collected during the same monitoring period.¶

(F) Reduced monitoring frequency:¶

(i) At water systems using only groundwater sources, water suppliers may reduce monitoring for lead and copper in source water to once every nine-year compliance cycle, provided samples are collected no later than every ninth calendar year, if:¶

(I) The water supplier demonstrates that finished drinking water entering the distribution system has concentrations of lead and copper below the maximum permissible lead and copper concentrations specified by the Authority according to OAR 333-061-0034(4)(b)(D) during at least three consecutive compliance periods; or¶

(II) The Authority determines that source water treatment is not necessary and the water supplier demonstrates during at least three consecutive compliance periods that the concentration of lead in source water was less than or equal to 0.005 mg/l and that the concentration of copper in source water was less than or equal to 0.65 mg/l.¶

(ii) At water systems using surface water or a combination of groundwater and surface water, water suppliers may reduce monitoring for lead and copper in source water to once during each nine-year compliance cycle, provided that the samples are collected no later than every ninth calendar year, if:¶

(I) Water suppliers demonstrate that finished drinking water entering the distribution system has concentrations of lead and copper below the maximum permissible lead and copper concentrations specified by the Authority according to OAR 333-061-0034(4)(b)(D) for at least three consecutive years; or¶

(II) The Authority determines that source water treatment is not necessary and the water supplier demonstrates during at least three consecutive years that the concentration of lead in source water was less than or equal to 0.005 mg/l and the concentration of copper in source water was less than or equal to 0.65 mg/l.¶

(iii) At water systems using a new source of water, water suppliers are not eligible for reduced monitoring for lead or copper until concentrations in samples collected from the new source during three consecutive monitoring periods are below the maximum permissible lead and copper concentrations specified by the Authority according to OAR 333-061-0034(4)(a)(E).¶

(h) Lead service line inventory and replacement requirements.¶

(A) Inventory requirements:¶

(i) Water suppliers must develop an inventory to identify the lead status of all public and private service lines connected to the public water distribution system. The inventory must:¶

(I) Be based on records, information, or identification methods approved by the Authority to assess service line materials; ¶

(II) Classify each public and private service line as described in paragraph (10)(h)(B) of this rule. Water suppliers are not required to physically verify the material composition (for example, copper or plastic) of a service line to identify its lead status in the inventory; and ¶

(III) Be submitted to the Authority no later than October 16, 2024, in a format approved by the Authority.¶

(ii) Each service line, or portion of the service line where ownership is split, must be categorized in the inventory in the following manner:¶

(I) "Lead" where the service line is made of lead.¶

(II) "Galvanized Requiring Replacement" where a galvanized service line is or was at any time downstream of a lead service line or is currently downstream of a "Lead Status Unknown" service line. If the water supplier is

unable to demonstrate that the galvanized service line was never downstream of a lead service line, it must presume there was an upstream lead service line. ¶

(III) "Non-lead" where the service line is determined through an evidence-based record, method, or technique not to be lead or galvanized requiring replacement. The water system may classify the actual material of the service line (for example, plastic or copper) as an alternative to classifying it as "Non-lead." ¶

(IV) "Lead Status Unknown" where the service line material is not known to be lead, galvanized requiring replacement, or a non-lead service line, such as where there is no documented evidence supporting material classification. ¶

(iii) Water suppliers must identify and update service line materials in the inventory as they are encountered during normal water system operations (including, but not limited to, checking service line materials when reading water meters or performing maintenance activities). ¶

(B) For any lead pipes, goosenecks or similar appurtenances found within a public water distribution system, water suppliers must: ¶

(i) Remove the component upon discovery; ¶

(ii) Include the component as part of a compliance schedule approved by the Authority according to OAR 333-061-0087(4); or ¶

(iii) Include the component as part of the replacement plan described in paragraph (10)(h)(C) of this rule, for removal as quickly as feasible. ¶

(C) At water systems with one or more lead, galvanized requiring replacement, or lead status unknown service lines in the distribution system or customer-owned portions of the service line, water suppliers must submit a lead service line replacement plan to the Authority no later than October 16, 2024. The plan must include a description of: ¶

(i) A strategy for determining the composition of lead status unknown service lines; ¶

(ii) A procedure for conducting full lead service line replacement; ¶

(iii) A strategy for informing customers before a full or partial lead service line replacement is conducted; ¶

(iv) A procedure instructing customers how to flush service lines and premise plumbing of particulate lead; ¶

(v) A lead service line replacement prioritization strategy based on factors including but not limited to the targeting of known lead service lines, lead service line replacement for disadvantaged consumers and populations most sensitive to the effects of lead; ¶

(vi) A funding strategy for replacing lead service lines which considers ways to accommodate customers that are unable to pay to replace the portion they own; and ¶

(viii) At water systems serving more than 10,000 people, water suppliers must identify a lead service line replacement goal rate, as approved by the Authority. ¶

(11) Monitoring requirements when 4-log treatment of viruses is provided at groundwater systems. ¶

(a) At groundwater systems where at least 4-log treatment of viruses (using inactivation, removal or an Authority-approved combination of 4-log virus inactivation and removal) is provided before or at the first customer for a groundwater source, water suppliers must comply with the requirements of this subsection within 30 days of placing the groundwater source in service. ¶

(A) The water supplier must notify the Authority in writing that it provides at least 4-log treatment of viruses. The notification must include engineering, operational, or other information as determined by the Authority necessary to evaluate the submission. ¶

(B) Disinfection and filtration effectiveness and reliability must be monitored as specified in subsections (11)(b) and (c) of this rule. ¶

(C) Groundwater source monitoring according to OAR 333-061-0036(6) must be conducted if 4-log treatment of viruses is subsequently discontinued for the groundwater-source. ¶

(b) Chemical Disinfection: ¶

(A) At groundwater systems serving more than 3,300 people, water suppliers must continuously monitor the residual disinfectant concentration using analytical methods as specified in OAR 333-061-0036(1) at a location approved by the Authority and must record the lowest residual disinfectant concentration each day water from the groundwater source is served to the public. The minimum residual disinfectant concentration determined by the Authority must be maintained every day water from the groundwater source is served to the public. If there is a failure in the continuous monitoring equipment, grab sampling must be conducted every four hours until continuous monitoring is restored. Water suppliers in all cases must resume continuous residual disinfectant monitoring within 14 days. ¶

(B) At groundwater systems serving 3,300 or fewer people, water suppliers must monitor the residual disinfectant concentration using analytical methods as specified in OAR 333-061-0036(1) at a location approved by the Authority and record the residual disinfection concentration each day that water from the groundwater source is served to the public. The minimum residual disinfectant concentration determined by the Authority must be maintained every day water from the groundwater-source is served to the public. Daily grab samples must be

collected during the hour of peak flow or at another time specified by the Authority. If any daily grab sample measurement falls below the minimum residual disinfectant concentration determined by the Authority, follow-up samples must be collected every four hours until the residual disinfectant concentration is restored to the Authority-determined level. Alternately, continuous monitoring may be conducted according to paragraph (11)(b)(A) of this rule. ¶

(c) At groundwater systems where ultraviolet light (UV) is used, water suppliers must verify reactors are operating within validated conditions as prescribed by OAR 333-061-0050(5)(k) by monitoring at a location approved by the Authority every day water is served to the public.¶

(A) Water suppliers must determine UV dose every day by monitoring parameters designated by the Authority for reactor operation, which may include, but are not limited to:¶

(i) UV intensity as measured by a UV sensor;¶

(ii) Flow rate;¶

(iii) Lamp status; or¶

(iv) UV transmittance. ¶

(B) Water suppliers must verify UV sensors are calibrated at least once every month.¶

(d) At water systems where membrane filtration is used to achieve at least 4-log removal of viruses, water suppliers must monitor and operate the membrane filtration process according to all Authority-specified monitoring and compliance requirements and must ensure:¶

(A) The membrane has an absolute molecular weight cut-off or an alternate parameter describing the exclusion characteristics of the membrane that can reliably achieve at least 4-log removal of viruses; ¶

(B) The membrane process is operated according to Authority-specified compliance requirements; and ¶

(C) The integrity of the membrane is intact as verified per OAR 333-061-0050(4)(c)(I). ¶

(de) At groundwater systems that use an Authority-approved alternative treatment to provide at least 4-log treatment of viruses (using inactivation, removal, or an Authority-approved combination of 4-log virus inactivation and removal) before or at the first customer, water suppliers must: ¶

(A) Monitor the alternative treatment according to all Authority-specified monitoring requirements; and ¶

(B) Operate the alternative treatment according to all compliance requirements that the Authority determines necessary to verify at least 4-log treatment of viruses. ¶

(ef) It is a violation of this rule if a water supplier fails to correct any disruption in treatment within four hours of determining the disruption is occurring at a groundwater system subject to the requirements of subsection (11)(b) of this rule where at least 4-log treatment of viruses (using inactivation, removal, or an Authority approved combination of 4-log virus inactivation and removal) is required before or at the first customer.

Statutory/Other Authority: ORS 448.131

Statutes/Other Implemented: ORS 448.131, 448.150, 448.273

RULE ATTACHMENTS DO NOT SHOW CHANGES. PLEASE CONTACT AGENCY REGARDING CHANGES.

**333-061-0036**  
**Sampling and Analytical Requirements**

Table 14

A	B	C	Designation	Sample Location
Y	Y	Y	EP for wellfield	Most susceptible well Entry point
Y	Y	N	Wellfield	Entry point for most susceptible well
N	Y	Y	EP for wellfield	Entry point for wellfield
Y	N	Y	EP for wells (not a wellfield)	Entry point
N	N	Y	EP for wells (not a wellfield)	Entry point
Y	N	N	Separate (not a wellfield)	Each entry point separately
N	Y	N	Separate (not a wellfield)	Each entry point separately
N	N	N	Separate (not a wellfield)	Each entry point separately

Note: A: wells are within 2,500 feet of each other; B: wells are in the same and no other aquifer;  
 C: wells have a common entry point to the distribution system and pump simultaneously.

Table 15

<u>Contaminant</u>	<u>Detection Limit (mg/l)</u>
Alachlor	0.0002
Atrazine	0.0001
Benzo(a) pyrene	0.00002
Carbofuran	0.0009
Chlordane	0.0002
Dalapon	0.001
Di(2-ethylhexyl) adipate	0.0006
Di(2-ethylhexyl) phthalate	0.0006
Dibromochloropropane (DBCP)	0.00002
Dinoseb	0.0002
Dioxin(2,3,7,8-TCDD)	0.000000005
Diquat	0.0004
Endothall	0.009
Endrin	0.00001
Ethylene Dibromide (EDB)	0.00001
Glyphosate	0.006

Heptachlor	0.00004
Heptachlor Epoxide	0.00002
Hexachlorobenzene	0.0001
Hexachlorocyclopentadiene	0.0001
Lindane(BHC-g)	0.00002
Methoxychlor	0.0001
Oxamyl(Vydate)	0.002
Picloram	0.0001
Polychlorinated Biphenyls (PCBs) (as Decachlorobiphenyl)	0.0001
Pentachlorophenol	0.00004
Simazine	0.00007
Toxaphene	0.001
2,4-D	0.0001
2,4,5-TP (Silvex)	0.0002

Table 16

Source water type	Population and category	Monitoring periods and frequency of sampling	Distribution system monitoring locations				
			Total per monitoring period	Near entry points	Average residence time	High TTHM locations	High HAA5 locations
Surface water or GWUDI:	< 500 purchasing water systems	One (during peak historical month) <sup>1</sup>	2	1		1	
	< 500 non-purchasing water systems	One (during peak historical month) <sup>1</sup>	2			1	1
	500-3,300 purchasing water systems	four (every 90 days)	2	1		1	
	500-3,300 non-purchasing water systems	four (every 90 days)	2			1	1
	3,301-9,999	four (every 90 days)	4		1	2	1
	10,000-49,999	six (every 60 days)	8	1	2	3	2
	50,000-249,999	six (every 60 days)	16	3	4	5	4
	250,000-999,999	six (every 60 days)	24	4	6	8	6
	1,000,000-4,999,999	six (every 60 days)	32	6	8	10	8

	≥5,000,000	six (every 60 days)	40	8	10	12	10
Ground-water:	< 500 purchasing water systems	one (during peak historical month) <sup>1</sup>	2	1		1	
	< 500 non-purchasing water systems	one (during peak historical month) <sup>1</sup>	2			1	1
	500-9,999	four (every 90 days)	2			1	1
	10,000-99,999	four (every 90 days)	6	1	1	2	2
	100,000-499,999	four (every 90 days)	8	1	1	3	3
	≥500,000	four (every 90 days)	12	2	2	4	4

<sup>1</sup> Peak historical month refers to the month with the highest TTHM or HAA5 levels, or the month of warmest water temperature.

Table 17

Source water type	Population	Monitoring frequency <sup>1</sup>	Distribution system monitoring location		
			Total per monitoring period <sup>2</sup>	Highest TTHM locations	Highest HAA5 locations
Surface water systems or GWUDI	< 500	per year	2	1	1
	500-3,300	per quarter	2	1	1
	3,301-9,999	per quarter	2	1	1
	10,000-49,999	per quarter	4	2	2
	50,000-249,999	per quarter	8	4	4
	250,000-999,999	per quarter	12	6	6
	1,000,000-4,999,999	per quarter	16	8	8
	≥5,000,000	per quarter	20	10	10
Groundwater	< 500	per year	2	1	1
	500-9,999	per year	2	1	1
	10,000-99,999	per quarter	4	2	2
	100,000-499,999	per quarter	6	3	3
	≥500,000	per quarter	8	4	4

<sup>1</sup> All water systems must monitor during month of highest DBP concentrations.



<sup>2</sup> Water systems on quarterly monitoring must collect dual sample sets every 90 days at each monitoring location, except for surface water or groundwater under the direct influence of surface water systems serving 500-3,300. Groundwater systems serving 500-9,999 on annual monitoring must collect dual sample sets at each monitoring location. All other water systems on annual monitoring, and systems using surface water or groundwater under the direct influence of surface water serving 500-3,300 are required to collect individual TTHM and HAA5 samples at the locations with the highest TTHM and HAA5 concentrations. Systems using surface water or groundwater under the direct influence of surface water serving 500-3,300 may collect one dual sample set per monitoring period if the highest TTHM and HAA5 concentrations occur at the same location. For systems serving fewer than 500 people, only one location with a dual sample set per monitoring period is needed if the highest TTHM and HAA5 concentrations occur at the same location, and month.

Source water type	Population size category	Monitoring Frequency <sup>1</sup>	Distribution system monitoring location total per monitoring period <sup>2</sup>
Surface water systems or GWUDI:	< 500	per year	2
	500-3,300	per quarter	2
	3,301-9,999	per quarter	2
	10,000-49,999	per quarter	4
	50,000-249,999	per quarter	8
	250,000-999,999	per quarter	12
	1,000,000-4,999,999	per quarter	16
	≥5,000,000	per quarter	20
Groundwater:	< 500	per year	2
	500-9,999	per year	2
	10,000-99,999	per quarter	4
	100,000-499,999	per quarter	6
	≥500,000	per quarter	8

<sup>1</sup> All systems must monitor during month of highest DBP concentrations.

<sup>2</sup> Water systems on quarterly monitoring must collect dual sample sets every 90 days at each monitoring location, except for surface water or groundwater under the direct influence of surface water systems serving 500-3,300. Groundwater systems serving 500-9,999 on annual monitoring must collect dual sample sets at each monitoring location. All other water systems on annual monitoring, and systems using surface water or groundwater under the direct influence of surface water serving 500-3,300 are required to collect individual TTHM and HAA5 samples at the locations with the highest TTHM and HAA5 concentrations. Systems using surface water or groundwater under the direct influence of surface water serving 500-3,300 may collect one dual sample set per monitoring period if the highest TTHM and HAA5 concentrations occur at the

same location. For systems serving fewer than 500 people, only one location with a dual sample set per monitoring period is needed if the highest TTHM and HAA5 concentrations occur at the same location, and month.

Table 19

Source water type	Population size category	Monitoring frequency <sup>1</sup>	Distribution system monitoring location per monitoring period
Surface water or GWUDI:	< 500		Monitoring may not be reduced.
	500-3,300	per year	One TTHM sample at the location and during the quarter with the highest TTHM single measurement, and one HAA5 sample at the location and during the quarter with the highest HAA5 single measurement; or one dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and during the same quarter.
	3,301-9,999	per year	2 dual sample sets, one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
	10,000-49,999	per quarter	2 dual sample sets, one each at the locations with the highest TTHM and highest HAA5 LRAAs.
	50,000-249,999	per quarter	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs.
	250,000-999,999	per quarter	6 dual sample sets at the locations with the three highest TTHM and three highest HAA5 LRAAs.
	1,000,000-4,999,999	per quarter	8 dual sample sets at the locations with the four highest TTHM and four highest HAA5 LRAAs.
	≥5,000,000	per quarter	10 dual sample sets—at the locations with the five highest TTHM and five highest HAA5 LRAAs.
Groundwater:	< 500	every third year	One TTHM sample at the location and during the quarter with the highest TTHM single measurement, and one HAA5 sample at the location and during the quarter with the highest HAA5 single measurement; or one dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and during the same quarter.
	500-9,999	per year	One TTHM sample at the location and during the quarter with the highest TTHM single measurement, and one HAA5 sample at the

			location and during the quarter with the highest HAA5 single measurement; or one dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and during the same quarter.
	10,000-99,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
	100,000-499,999	per quarter	2 dual sample sets; at the locations with the highest TTHM and highest HAA5 LRAAs.
	≥500,000	per quarter	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs.

<sup>1</sup> Systems on quarterly monitoring must take dual sample sets every 90 days.

Table 20

Population Served:	Samples Per Week:
500 or less	1
501 to 3,300	2
3,301 to 10,000	3
10,001 to 25,000	4
More than 25,000.	5

Table 21

CT Values (CT <sub>99.9</sub> ) for 99.9 Percent Inactivation of <i>Giardia Lamblia</i> Cysts by Free Chlorine at 0.5 °C(33°F) or Lower <sup>1</sup>							
	Free residual (mg/l)						
	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	137	163	195	237	277	329	390
0.6	141	168	200	239	286	342	407
0.8	145	172	205	246	295	354	422
1.0	148	176	210	253	304	365	437
1.2	152	180	215	259	313	376	451
1.4	155	184	221	266	321	387	464
1.6	157	189	226	273	329	397	477
1.8	162	193	231	279	338	407	489
2.0	165	197	236	286	345	417	500
2.2	169	201	242	297	353	426	511
2.4	172	205	247	298	361	435	522
2.6	175	209	252	304	368	444	533
2.8	178	213	257	310	375	452	543

3.0	181	217	261	316	382	460	552
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<sup>1</sup> These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT<sub>99.9</sub> values at the lower temperature and at the higher pH.

Table 22

CT Values (CT <sub>99.9</sub> ) Percent Inactivation of <i>Giardia Lamblia</i> Cysts by Free Chlorine at 5.0 °C(41°F) <sup>1</sup>							
	Free residual (mg/l)						
	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	97	117	139	166	198	236	279
0.6	100	120	143	171	204	244	291
0.8	103	122	146	175	210	252	301
1.0	105	125	149	179	216	260	312
1.2	107	127	152	183	221	267	320
1.4	109	130	155	187	227	274	329
1.6	111	132	158	192	232	281	337
1.8	114	135	162	196	238	287	345
2.0	116	138	165	200	243	294	353
2.2	118	140	169	204	248	300	361
2.4	120	143	172	209	253	306	368
2.6	122	149	175	213	258	312	375
2.8	124	148	178	217	263	318	382
3.0	126	151	182	221	268	324	389

<sup>1</sup> These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT<sub>99.9</sub> value at the lower temperature, and at the higher pH.

Table 23

CT Values (CT <sub>99.9</sub> ) for 99.9 Percent Inactivation of <i>Giardia Lamblia</i> Cysts by Free Chlorine at 10.0 °C(50°F) <sup>1</sup>							
	Free residual (mg/l)						
	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	73	88	104	125	149	177	209
0.6	75	90	107	128	153	183	218
0.8	78	92	110	131	158	189	226
1.0	79	94	112	134	162	195	234
1.2	80	95	114	137	166	200	240
1.4	82	98	116	140	170	206	247

1.6	83	99	119	144	174	211	253
1.8	86	101	122	147	179	215	259
2.0	87	104	124	150	182	221	265
2.2	89	105	127	153	186	225	271
2.4	90	107	129	157	190	230	276
2.6	92	110	131	160	194	234	281
2.8	93	111	134	163	197	239	287
3.0	95	113	137	166	201	243	292

<sup>1</sup> These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT<sub>99.9</sub> value at the lower temperature, and at the higher pH.

Table 24

CT Values (CT <sub>99.9</sub> ) for 99.9 Percent Inactivation of <i>Giardia Lamblia</i> Cysts by Free Chlorine at 15.0 °C(59°F) <sup>1</sup>							
Free residual (mg/l)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	49	59	70	83	99	118	140
0.6	50	60	72	86	102	122	146
0.8	52	61	73	88	105	126	151
1.0	53	63	75	90	108	130	156
1.2	54	64	76	92	111	134	160
1.4	55	65	78	94	114	137	165
1.6	56	66	79	96	116	141	169
1.8	57	68	81	98	119	144	173
2.0	58	69	83	100	122	147	177
2.2	59	70	85	102	124	150	181
2.4	60	72	86	105	127	153	184
2.6	61	73	88	107	129	156	188
2.8	62	74	89	109	132	159	191
3.0	63	76	91	111	134	162	195

<sup>1</sup> These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT<sub>99.9</sub> value at lower temperature, and at the higher pH.

Table 25

CT Values (CT <sub>99.9</sub> ) for 99.9 Percent Inactivation of <i>Giardia Lamblia</i> Cysts by Free Chlorine at 20 °C(68°F) <sup>1</sup>							
Free residual (mg/l)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	36	44	52	62	74	89	105

0.6	38	45	54	64	77	92	109
0.8	39	46	55	66	79	95	113
1.0	39	47	56	67	81	98	117
1.2	40	48	57	69	83	100	120
1.4	41	49	58	70	85	103	123
1.6	42	50	59	72	87	105	126
1.8	43	51	61	74	89	108	129
2.0	44	52	62	75	91	110	132
2.2	44	53	63	77	93	113	135
2.4	45	54	65	78	95	115	138
2.6	46	55	66	80	97	117	141
2.8	47	56	67	81	99	118	143
3.0	47	57	68	83	101	122	146

<sup>1</sup> These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT<sub>99.9</sub> value at the lower temperature, and at the higher pH.

Table 26

CT Values (CT <sub>99.9</sub> ) for 99.9 Percent Inactivation of <i>Giardia Lamblia</i> Cysts by Free Chlorine at 25 °C(77°F) <sup>1</sup> and Higher							
Free residual (mg/l)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	24	29	35	48	50	59	70
0.6	25	30	36	43	51	61	73
0.8	26	31	37	44	53	63	75
1.0	26	31	37	45	54	65	78
1.2	27	32	38	46	55	67	80
1.4	27	33	39	47	57	69	82
1.6	28	33	40	48	58	70	84
1.8	29	34	41	49	60	72	86
2.0	29	35	41	50	61	74	88
2.2	30	35	42	51	62	75	90
2.4	30	36	43	52	63	77	92
2.6	31	37	44	53	65	78	94
2.8	31	37	45	54	66	80	96
3.0	32	38	46	55	67	81	97

<sup>1</sup> These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT<sub>99.9</sub> value at the lower temperature, and at the higher pH.

Table 27

-CT Values (CT <sub>99.9</sub> ) Percent Inactivation of <i>Giardia Lamblia</i> Cysts by Chlorine Dioxide and Ozone <sup>1</sup>						
Temperature						
	<1°C	5 °C	10 °C	15 °C	20 °C	>25 °C
Chlorine dioxide	63	26	23	19	15	11
Ozone	2.9	1.9	1.4	0.95	0.72	0.48

<sup>1</sup> These CT values achieve greater than 99.99 percent inactivation of viruses. CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the CT<sub>99.9</sub> value at the lower temperature for determining CT<sub>99.9</sub> values between indicated temperatures.

Table 28

CT Values (CT <sub>99.9</sub> ) for 99.9 Percent Inactivation of <i>Giardia Lamblia</i> Cysts by Chloramines <sup>1</sup>					
Temperature					
<1°C	5 °C	10 °C	15 °C	20 °C	>25 °C
3,800	2,200	1,850	1,500	1,100	750

<sup>1</sup> These values are for pH values of 6 to 9. These CT values may be assumed to achieve greater than 99.99 percent inactivation of viruses only if chlorine is added and mixed in the water prior to the addition of ammonia. If this condition is not met, the system must demonstrate, based on demonstration studies or other information, as approved by the Authority, that the system is achieving at least 99.99 percent inactivation of viruses. CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the CT<sub>99.9</sub> value at the lower temperature for determining CT<sub>99.9</sub> values between indicated temperatures.

Table 29

Population	Samples per day
500 or Less	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

Table 30

CT Values (mg-min/L) for *Cryptosporidium* Inactivation by Chlorine Dioxide\*

Log Credit	Water Temperature, Deg. C										
	≤0.5	1	2	3	5	7	10	15	20	25	30
0.25	159	153	140	128	107	90	69	45	29	19	12

0.5	319	305	279	256	214	180	138	89	58	38	24
1.0	637	610	558	511	429	360	277	179	116	75	49
1.5	956	915	838	767	643	539	415	268	174	113	73
2.0	1275	1220	1117	1023	858	719	553	357	232	150	98
2.5	1594	1525	1396	1278	1072	899	691	447	289	188	122
3.0	1912	1830	1675	1534	1286	1079	830	536	347	226	147

\*Systems may use this equation to determine log credit between the indicated values:  
 $\text{Log credit} = (0.001506 \times (1.09116)^{\text{temp}}) \times \text{CT}$ .

Table 31  
 CT Values (mg-min/L) for *Cryptosporidium* Inactivation by Ozone\*

Log Credit	Water Temperature, Deg. C										
	≤0.5	1	2	3	5	7	10	15	20	25	30
0.25	6.0	5.8	5.2	4.8	4.0	3.3	2.5	1.6	1.0	0.6	0.39
0.5	12	12	10	9.5	7.9	6.5	4.9	3.1	2.0	1.2	0.78
1.0	24	23	21	19	16	13	9.9	6.2	3.9	2.5	1.6
1.5	36	35	31	29	24	20	15	9.3	5.9	3.7	2.4
2.0	48	46	42	38	32	26	20	12	7.8	4.9	3.1
2.5	60	58	52	48	40	33	25	16	9.8	6.2	3.9
3.0	72	69	63	57	47	39	30	19	12	7.4	4.7

\*Systems may use this equation to determine log credit between the indicated values:  $\text{Log credit} = (0.0397 \times (1.09757)^{\text{temp}}) \times \text{CT}$ .

Table 32  
 UV Dose Table for *Cryptosporidium*, *Giardia lamblia*, and Virus Inactivation Credit

Log Credit	<i>Cryptosporidium</i> UV dose (mJ/cm <sup>2</sup> )	<i>Giardia Lamblia</i> UV dose (mJ/cm <sup>2</sup> )	Virus UV dose (mJ/cm <sup>2</sup> )
0.5	1.6	1.5	39
1.0	2.5	2.1	58
1.5	3.9	3.0	79
2.0	5.8	5.2	100
2.5	8.5	7.7	121
3.0	12	11	143
3.5	15	15	163
4.0	22	22	186



Table 33  
Source water monitoring start dates

Systems that serve	Must begin the first round of source water monitoring no later than the month beginning	And must begin the second round of source water monitoring no later than the month beginning
At least 100,000 people	October 1, 2006	April 1, 2015
From 50,000 to 99,999 people	April 1, 2007	October 1, 2015
From 10,000 to 49,999 people	April 1, 2008	October 1, 2016
Fewer than 10,000 people and monitor for <i>E. coli</i> (filtered water systems only)	October 1, 2008	October 1, 2017
Fewer than 10,000 and monitor for <i>Cryptosporidium</i> *	April 1, 2010	April 1, 2019

\*Applies to filtered water systems that meet the conditions of subparagraph (5)(e)(A)(iv) of this rule and unfiltered water systems.

TABLE 34 Total Coliform Monitoring Frequency at Public Water Systems Serving More Than 1,000 People			
Population served	Minimum number of samples per month	Population served	Minimum number of samples per month
1,001 to 2,500	2	70,001 to 83,000	80
2,501 to 3,300	3	83,001 to 96,000	90
3,301 to 4,100	4	96,001 to 130,000	100
4,101 to 4,900	5	130,001 to 220,000	120
4,901 to 5,800	6	220,001 to 320,000	150
5,801 to 6,700	7	320,001 to 450,000	180
6,701 to 7,600	8	450,001 to 600,000	210
7,601 to 8,500	9	600,001 to 780,000	240
8,501 to 12,900	10	780,001 to 970,000	270
12,901 to 17,200	15	970,001 to 1,230,000	300
17,201 to 21,500	20	1,230,001 to 1,520,000	330
21,501 to 25,000	25	1,520,001 to 1,850,000	360
25,001 to 33,000	30	1,850,001 to 2,270,000	390

33,001 to 41,000	40	2,270,001 to 3,020,000	420
41,001 to 50,000	50	3,020,001 to 3,960,000	450
50,001 to 59,000	60	3,960,001 or more	480
59,001 to 70,000	70		

AMEND: 333-061-0040

RULE SUMMARY: Amend OAR 333-061-0040: The Reporting and Record Keeping rule was amended to clarify record keeping requirements when UV treatment is used for 4-log disinfection of groundwater.

CHANGES TO RULE:

333-061-0040

Reporting and Record Keeping ¶¶

(1) Reporting requirements:¶¶

(a) Any person who has reason to believe that his or her actions have led to contamination of a public water system shall report that fact immediately to the water supplier and the Authority.¶¶

(b) Laboratory Reporting:¶¶

(A) Analyses required by OAR 333-061-0036 and performed by an accredited laboratory as defined in OAR 333-061-0036(1)(b) must be reported on a form produced by the accredited laboratory. The laboratory analysis report must be submitted to the Authority within 10 days of the end of the month, or within 10 days of the end of the required monitoring period.¶¶

(B) "Analytical Run" means the process during which a set of analytical drinking water samples along with an appropriate number of blanks, matrix spikes, or quality control samples are analyzed according to National Environmental Laboratory Accreditation Conference requirements to determine the presence, absence, or concentration of a specific target analyte or analytes. An analytical run is complete when the instrument performing the sample analysis generates a report of the sample analysis.¶¶

(C) Mandatory reporting requirements for primary laboratories as defined in OAR 333-061-0036(1)(b)(A). These laboratories must:¶¶

(i) Validate the results of any sample analysis and report that analysis directly to the Authority and to the water supplier within 48 hours or two business days of completing the analytical run if the samples analysis:¶¶

(I) Exceeds the MCL for nitrate as specified in OAR 333-061-0030(1); or¶¶

(II) Is positive for coliform bacteria.¶¶

(ii) Report any sample analysis directly to the Authority and to the water supplier within 24 hours or on the next business day after validating a sample result that exceeds the MCL for any chemical analyte specified in OAR 333-061-0030 other than nitrate.¶¶

(iii) Report any sample analysis directly to the Authority and to the water supplier within 24 hours or on the next business day after obtaining a sample result from a subcontracted laboratory, if the sample analysis:¶¶

(I) Exceeds the MCL for nitrate as specified in OAR 333-061-0030(1) or is positive for coliform bacteria; or¶¶

(II) Exceeds the MCL for any chemical analyte specified in OAR 333-061-0030 other than nitrate upon validating the sample analysis.¶¶

(D) Mandatory reporting requirements for subcontracted laboratories as defined in OAR 333-061-0036(1)(b)(B). These laboratories must:¶¶

(i) Validate the results of any sample analysis and report that analysis to their client laboratory within 48 hours or two business days of completing the analytical run if the analysis:¶¶

(I) Exceeds the MCL for nitrate as specified in OAR 333-061-0030(1); or¶¶

(II) Is positive for coliform bacteria.¶¶

(ii) Report any sample analysis to their client laboratory within 24 hours or on the next business day after validating a sample result that exceeds the MCL for any chemical analyte specified in OAR 333-061-0030 other than nitrate.¶¶

(c) Water suppliers must report the following events to the Authority within 24 hours or sooner as prescribed in this subsection.¶¶

(A) The detection of any substance or pathogenic organisms in the water that has caused or is likely to cause physical suffering or illness.¶¶

(B) An exceedance of the MCL for E. coli, which must be reported to the Authority by the end of the day when the water supplier learns of the exceedance and which must be followed by public notice according to OAR 333-061-0042.¶¶

(C) Notification of an E. coli-positive routine sample, which must be reported to the Authority according to by the end of the day when the water supplier learns of the result, unless the water supplier is notified of the result after the Authority office is closed, in which case the water supplier must notify the Authority before the end of the next business day.¶¶

(D) Violation of a coliform investigation requirement as specified in OAR 333-061-0078(5), which must be followed by public notice according to OAR 333-061-0042.¶¶

(d) The water supplier using a surface water source or a groundwater source under direct influence of surface

water which provides filtration treatment shall report monthly after filtration is installed to the Authority the results of any test, measurement or analysis required by OAR 333-061-0036(5)(b) of these rules within 10 days after the end of the month.¶

(A) All systems using surface water or groundwater under the direct influence of surface water shall consult with the Authority within 24 hours, after learning:¶

(i) That the turbidity exceeded 5 NTU;¶

(ii) Of a waterborne disease outbreak potentially attributable to that water system;¶

(iii) That the disinfectant residual concentration in the water entering the distribution system fell below 0.2 mg/l and whether or not the residual was restored to at least 0.2 mg/l within four hours.¶

(B) In addition to the reporting and recordkeeping requirements in paragraph (1)(d)(A) of this rule, a public water system which provides conventional filtration treatment or direct filtration serving at least 10,000 people must report monthly to the Authority the information specified in subparagraphs (1)(d)(B)(i) and (ii) of this rule. Public water systems which provide filtration treatment other than conventional filtration treatment, direct filtration, slow sand filtration, and diatomaceous earth filtration, regardless of population served, must also meet the requirements of paragraph (1)(d)(A) of this rule and must report monthly to the Authority the information specified in subparagraph (1)(d)(B)(i) of this rule. For the purposes of this rule, filter profile means a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from start-up to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.¶

(i) Turbidity measurements as required by OAR 333-061-0036(5) must be reported within 10 days after the end of each month the system serves water to the public. Information that must be reported includes:¶

(I) The total number of filtered water turbidity measurements taken during the month;¶

(II) The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified by OAR 333-061-0030(3)(b)(A) through (D);¶

(III) The date and value of any turbidity measurements taken during the month which exceed 1 NTU for systems using conventional filtration treatment or direct filtration, or which exceed the maximum level set by the Authority specified in OAR 333-061-0030(3)(b)(D).¶

(IV) The date and value of any turbidity measurements taken during the month which exceed 5 NTU for systems using slow sand filtration or diatomaceous earth filtration.¶

(ii) Water systems must maintain the results of individual filter monitoring for at least three years. Water systems must report that they have conducted individual filter turbidity monitoring within 10 days after the end of each month the system serves water to the public. Water systems must also report individual filter turbidity measurement results within 10 days after the end of each month the system serves water to the public only if measurements demonstrate one or more of the conditions in sub-subparagraphs (1)(d)(B)(ii)(I) through (IV) of this rule. Water systems that use lime softening may apply to the Authority for alternative exceedance levels for the levels specified in sub-subparagraphs (1)(d)(B)(ii)(I) through (IV) of this rule if the water system can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.¶

(I) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the water system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the water system must either produce a filter profile for the filter within seven days of the exceedance (if the water system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.¶

(II) For any individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the system must report the filter number, the turbidity, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within seven days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.¶

(III) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of three consecutive months, the water system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the water system must conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-assessment was conducted. The self assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report.¶

(IV) For any individual filter that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of two consecutive months, the water system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the water system must arrange to have a CPE by the Authority or a third party approved by the Authority conducted no later than 30 days following the exceedance and have the evaluation completed and submitted to the Authority no later than 90 days following the exceedance.¶

(iii) If at any time the turbidity exceeds 1 NTU in representative samples of filtered water in a system using conventional filtration treatment or direct filtration, the system must inform the Authority as soon as possible, but no later than the end of the next business day.¶

(iv) If at any time the turbidity in representative samples of filtered water exceed the maximum level set by the Authority as specified in OAR 333-061-0030(3)(b)(D) for filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, the water system must inform the Authority as soon as possible, but no later than the end of the next business day.¶

(C) In addition to the reporting and recordkeeping requirements in paragraph (1)(d)(A) of this rule, a public water system which provides conventional filtration treatment or direct filtration treatment serving less than 10,000 people must report monthly to the Authority the information specified in subparagraphs (1)(d)(B)(i) of this rule and the information specified in subparagraph (1)(d)(D) of this rule. Public water systems which provide filtration treatment other than conventional filtration treatment, direct filtration, slow sand filtration, and diatomaceous earth filtration regardless of population served must also meet the requirements of paragraph (1)(d)(A) of this rule and must report monthly to the Authority the information specified in subparagraph (1)(d)(B)(i) of this rule.¶

(D) Water systems must maintain the results of individual filter monitoring for at least three years. Water systems must report that they have conducted individual filter turbidity monitoring within 10 days after the end of each month the system serves water to the public. Water systems must also report individual filter turbidity measurement results within 10 days after the end of each month the system serves water to the public only if measurements demonstrate one or more of the conditions in subparagraphs (1)(d)(D)(i) through (iii) of this rule. Water systems that use lime softening may apply to the Authority for alternative exceedance levels for the levels specified in subparagraphs (1)(d)(D)(i) through (iii) of this rule if the water system can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.¶

(i) If the turbidity of an individual filter (or the turbidity of the combined filter effluent (CFE) for systems with two or less filters that monitor CFE in lieu of individual filter monitoring) is greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the water system must report to the Authority by the 10th day of the following month the filter number(s), the turbidity value(s) that exceeded 1.0 NTU, the corresponding date(s) of occurrence, and the cause (if known) for the elevated turbidity values. The Authority may request the water system produce a turbidity profile for the filter(s) in question.¶

(ii) If the turbidity of an individual filter (or the turbidity of the combined filter effluent (CFE) for systems with two or less filters that monitor CFE in lieu of individual filter monitoring) is greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart for three consecutive months, the water system must conduct a filter self-assessment within 14 days of the date the turbidity exceeded 1.0 NTU during the third month, unless a CPE is performed in lieu of a filter self-assessment. Systems with two filters monitoring the CFE must conduct a filter self-assessment for both filters. The self-assessment must consist of the following components: assessment of filter performance; development of a filter profile as defined in paragraph (1)(d)(B) of this rule; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report. When a self-assessment is required, the water system must report the date the self-assessment was triggered, the date the self-assessment was completed, and the conclusion(s) of the self-assessment by the 10th of the following month or 14 days after the self-assessment was triggered only if the self-assessment was triggered during the last four days of the month.¶

(iii) If the turbidity of an individual filter (or the turbidity of the combined filter effluent (CFE) for systems with two or less filters that monitor CFE in lieu of individual filter monitoring) is greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart for two consecutive months, the water system must report these turbidity results to the Authority by the 10th of the following month and arrange to have a CPE by the Authority or a third party approved by the Authority conducted within 60 days of the date the turbidity exceeded 2.0 NTU during the second month. The CPE report must be submitted to the Authority no later than 120 days following the date the turbidity exceeded 2.0 NTU during the second month. A CPE is not needed if the Authority or approved third party has conducted a CPE within the last 12 months or the Authority and the water system are jointly participating in an on-going Comprehensive Technical Assistance (CTA) project as part of the Composite Correction Program with the water system. When a CPE is required, the water system must report that a CPE is required and the date that the CPE was triggered by the 10th day of the following month.¶

(e) The water supplier for water systems using a surface water source or a groundwater source under direct influence of a surface source which does not provide filtration treatment shall report according to subsection

(1)(d) of this rule in addition to the requirements of this subsection. Monthly reporting must begin no later than six months after the Authority determines a source to be GWUDI.¶

(A) Report to the Authority within 10 days after the end of each month, the results or analysis of:¶

(i) Fecal coliform or total coliform bacteria test results on raw (untreated) source water.¶

(ii) Daily disinfection "CT" values including parameters such as pH measurements, temperature, and disinfectant residuals at the first customer used to compute the "CT" values.¶

(iii) Daily determinations using the "CT" values of the adequacy of disinfectant available for inactivation of *Giardia lamblia* or viruses as specified in OAR 333-061-0032(1)(a).¶

(B) Report to the Authority within 10 days after the end of each Federal Fiscal year (September 30), the results of:¶

(i) The watershed control program requirements as specified in OAR 333-061-0032(2)(b)(B).¶

(ii) The on-site inspection summary requirements as specified in OAR 333-061-0032(2)(b)(C).¶

(f) Special reporting requirements for groundwater systems.¶

(A) Water suppliers monitoring disinfection effectiveness for groundwater systems according to OAR 333-061-0036(11)(b) must notify the Authority any time the Authority-specified operating requirements are not met, including but not limited to, minimum residual disinfectant concentration, ultraviolet light (UV) reactor operation, membrane operating criteria or membrane integrity, and alternative treatment operating criteria, if operation in accordance with the specified criteria is not restored within four hours. The water supplier must notify the Authority as soon as possible, but in no case later than the end of the next business day.¶

(B) Water suppliers must notify the Authority within 30 days of completing any corrective action as prescribed by OAR 333-061-0032(6).¶

(C) At groundwater systems subject to the requirements of OAR 333-061-0036(6)(i), water suppliers must provide documentation to the Authority within 30 days that a total coliform-positive sample met Authority criteria for exceptions to triggered source water monitoring requirements because the total coliform-positive sample was attributed to distribution system conditions.¶

(D) At groundwater systems where monitoring as prescribed by OAR 333-061-0036(11)(b) is conducted, water suppliers must report the results of daily residual disinfectant concentration measurements or UV reactor operations at the entry point within 10 days after the end of each month.¶

(g) All Community and NTNC public water systems shall report all of the following information pertaining to lead and copper to the Authority in accordance with the requirements of this subsection.¶

(A) Except as provided in subparagraph (1)(h)(A)(vii) of this rule, a public water system shall report the information below for all tap water samples and for all water quality parameter samples within 10 days following the end of each applicable monitoring period. For monitoring periods with a duration less than six-months, the end of the monitoring period is the last date samples can be collected during that period.¶

(i) The results of all tap samples for lead and copper including the location of each site and the criteria under which the site was selected for the system's sampling pool. With the exception of initial tap sampling, the system shall designate any site which was not sampled during previous monitoring periods, and include an explanation of why sampling sites have changed. By the applicable date specified in OAR 333-061-0036(10)(d)(A) for commencement of initial monitoring, each Community Water System which does not complete its targeted sampling pool meeting the criteria for tier 1 sampling sites shall send a letter to the Authority justifying its selection of tier 2 or tier 3 sampling sites. By the applicable date specified in OAR 333-061-0036(10)(d)(A) for commencement of initial monitoring, each NTNC water system which does not complete its sampling pool meeting the criteria for tier 1 sampling sites shall send a letter to the Authority justifying its selection of sampling sites.¶

(ii) A certification that each first draw sample collected by the water system is one-liter in volume and, to the best of their knowledge, has stood motionless in the service line, or in the interior plumbing of a sampling site, for at least six hours. Where residents collected samples, a certification that each tap sample collected by the residents was taken after the water system informed them of proper sampling procedures according to OAR 333-061-0036(10)(b).¶

(iii) The results of all tap samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica, and the results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters according to OAR 333-061-0036(10)(f).¶

(iv) Each water system that requests that the Authority reduce the number and frequency of sampling shall provide the information required in OAR 333-061-0036(10)(d)(D).¶

(v) Documentation for each tap water lead and copper sample for which the water system requests invalidation.¶

(vi) The 90th percentile lead and copper tap water samples collected during each monitoring period.¶

(vii) A water system shall report the results of all water quality parameter samples collected for follow-up tap monitoring prescribed in OAR 333-061-0036(10)(f) during each six-month monitoring period within 10 days following the end of the monitoring period unless the Authority specifies a more frequent monitoring requirement.¶

(B) A water system shall report the sampling results for all source water samples collected for lead and copper within the first 10 days following the end of each source water monitoring period according to OAR 333-061-0036(10)(g). With the exception of the first round of source water sampling, the system shall specify any site which was not sampled during previous monitoring periods, and include an explanation of why the sampling point has changed.¶

(C) Corrosion control treatment reporting requirements. By the applicable dates according to OAR 333-061-0034(2)(a) through (d), systems shall report the following information: for systems demonstrating that they have already optimized corrosion control, the information required in OAR 333-061-0034(2)(d)(B) or (C); for systems required to optimize corrosion control, their recommendation regarding optimal corrosion control treatment according to OAR 333-061-0034(3)(a); for systems required to evaluate the effectiveness of corrosion control treatments, the information required in OAR 333-061-0034(3)(b) of these rules; for systems required to install optimal corrosion control designated by the Authority according to OAR 333-061-0034(3)(h), a letter certifying that the system has completed the installation.¶

(D) Source water treatment reporting requirements. By the applicable dates according to OAR 333-061-0034(4)(a), systems shall report the following information to the Authority: the system's recommendation regarding source water treatment if required according to OAR 333-061-0034(4)(b)(A); for systems required to install source water treatment according to OAR 333-061-0034(4)(b)(B), a letter certifying that the system has completed the installation of the treatment designated by the Authority within 24 months after the Authority designated the treatment.¶

(E) Public education program reporting requirements.¶

(i) Any water system that is subject to the public education requirements in OAR 333-061-0034(5) shall, within 10 days after the end of each period in which the system is required to perform public education tasks in accordance with OAR 333-061-0034(5)(c), send written documentation to the Authority that contains:¶

(I) A demonstration that the system has delivered the public education materials that meet the content and delivery requirements specified in OAR 333-061-0034(5)(a) through (c); and¶

(II) A list of all the newspapers, radio stations, television stations, and facilities and organizations to which the system delivered public education materials during the period in which the system was required to perform public education tasks.¶

(ii) Unless required by the Authority, a system that previously has submitted the information in sub-subparagraph (1)(g)(E)(i)(II) of this rule need not resubmit the information, as long as there have been no changes in the distribution list and the system certifies that the public education materials were distributed to the same list submitted previously.¶

(iii) No later than three months following the end of the monitoring period, each system must mail a sample copy of the consumer notification of tap results to the Authority along with a certification that the notification has been distributed in a manner consistent with the requirements of OAR 333-061-0034(5)(e).¶

(F) Any system which collects sampling data in addition to that required by this subsection shall report the results to the Authority within the first 10 days following the end of the applicable monitoring period under OAR 333-061-0036(10) during which the samples are collected.¶

(G) At a time specified by the Authority prior to the addition of a new source or any long-term change in water treatment, a water system deemed to have optimized corrosion control, or is subject to reduced monitoring, shall submit written documentation to the Authority describing the change or addition. The Authority must review and approve the addition or change before it is implemented by the water system.¶

(H) Each ground water system that limits water quality parameter monitoring to a subset of entry points shall provide written correspondence to the Authority that identifies the selected entry points and includes information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system. This correspondence must be submitted to the Authority prior to commencement of such monitoring.¶

(h) The water supplier shall report to the Authority the results of any test, measurement or analysis required by these rules that is performed on site (for example, supplemental fluoride) by trained personnel within 10 days after the end of the month, except that reports which indicate that fluoride levels exceed 4.0 mg/l shall be reported within 48 hours:¶

(i) The water supplier shall submit to the Authority within 10 days after completing any public notification action as prescribed in OAR 333-061-0042 a representative copy of each type of notice distributed to the water users or made available to the public and the media along with certification that the system has fully complied with the distribution and public notification requirements.¶

(j) Water systems required to sample for the contaminants listed in OAR 333-061-0036(4)(c) through (4)(e) or (4)(g) through (4)(k) must report the information listed in Tables 35 through 37 to the Authority. Water systems monitoring quarterly or more frequently must report to the Authority within 10 days after the end of each quarter in which samples were collected. Water systems required to sample less frequently than quarterly must report to

the Authority within 10 days after the end of each monitoring period in which samples were collected. Water systems are required to submit the information listed in Tables 35 through 37, within 10 days of the end of any quarter in which monitoring is required.¶

(A) Disinfection byproducts. Water systems must report the information specified in Table 35.¶

(B) Disinfectants. Water systems must report the information specified in Table 36.¶

(C) Disinfection byproduct precursors and enhanced coagulation or enhanced softening. Water systems must report the information specified in Table 37.¶

(D) The Authority may choose to perform calculations and determine whether the MCL was exceeded or the system is eligible for reduced monitoring in lieu of having the system report that information.¶

(k) Systems using surface water or GWUDI sources must respond to the Authority within 45 days of receiving a sanitary survey report or CPE report that identifies significant deficiencies. The response must meet the criteria specified in OAR 333-061-0076(65)(a). Failure to report to the Authority requires a Tier 2 public notice as prescribed in OAR 333-061-0042(2)(b)(D).¶

(l) Reporting requirements related to triggered coliform investigations.¶

(A) Water suppliers required to conduct a level 1 coliform investigation as prescribed by OAR 333-061-0078 must submit a completed investigation report as prescribed by OAR 333-061-0078(3) to the Authority within 30 days of learning a trigger as specified in OAR 333-061-0078(2) was exceeded. Water suppliers subject to a level 2 coliform investigation as prescribed by OAR 333-061-0078(3) must ensure a completed investigation report is submitted to the Authority within 30 days of learning a trigger as specified in OAR 333-061-0078(2) was exceeded.¶

(B) Water suppliers must report to the Authority the completion of every scheduled corrective action within 30 days for corrections not completed by the time the investigation report was reported to the Authority as specified in paragraph (1)(l)(A) of this rule.¶

(m) Water suppliers that have failed to comply with a coliform monitoring requirement as prescribed by OAR 333-061-0036(6) must report the monitoring violation to the Authority within 10 days after the water supplier discovers the violation, and notify the public in accordance with OAR 333-061-0042.¶

(n) Water suppliers responsible for seasonal water systems must certify in a manner determined by the Authority, that an Authority-approved start-up procedure has been completed prior to serving water to the public. Water suppliers must submit the certification to the Authority prior to the seasonal water system opening for the season and serving water to the public.¶

(o) Reporting source water monitoring results for Cryptosporidium and E. coli collected in accordance with OAR 333-061-0036(5)(e). Water systems must report results from the source water monitoring no later than 10 days after the end of the first month following the month when the sample is collected as prescribed by this subsection.¶

(A) Water systems must report the following data elements for each Cryptosporidium analysis: PWS ID, facility ID, sample collection date, sample type (field or matrix spike), sample volume filtered in Liters (to nearest 250 mL), whether 100 percent of the filtered volume was examined, and the number of oocysts counted.¶

(i) For matrix spike samples, water systems must also report the sample volume spiked and estimated number of oocysts spiked. These data are not required for field samples.¶

(ii) For samples in which less than 10 L is filtered or less than 100 percent of the sample volume is examined, systems must also report the number of filters used and the packed pellet volume.¶

(iii) For samples in which less than 100 percent of sample volume is examined, systems must also report the volume of re-suspended concentrate and volume of this re-suspension processed through immunomagnetic separation.¶

(B) Water systems must report the following data elements for each E. coli analysis: PWS ID, facility ID, sample collection date, analytical method number, method type, source type (flowing stream, lake/reservoir, or GWUDI), E. coli/100 mL, and turbidity (if required). For the purposes of Cryptosporidium monitoring and reporting, lake/reservoir means a natural or man-made basin or hollow on the Earth's surface in which water collects or is stored that may or may not have a current or single direction of flow.¶

(p) Reporting requirements relating to Cryptosporidium protection.¶

(A) Water systems must report sampling schedules prescribed by OAR 333-061-0036(5)(f) and source water monitoring results in accordance with subsection (1)(p) of this rule unless they notify the Authority that they will not conduct source water monitoring due to meeting the criteria of OAR 333-061-0036(5)(e)(D).¶

(B) Filtered water systems must report their Cryptosporidium bin classification as described in OAR 333-061-0032(4)(f).¶

(C) Unfiltered water systems must report their mean source water Cryptosporidium level as described in OAR 333-061-0032(2)(c).¶

(D) Water systems must report disinfection profiles and benchmarks to the Authority as prescribed by OAR 333-061-0036(4)(l) and 333-061-0060(1)(e) prior to making a significant change in disinfection practice.¶



- (E) Water systems must report to the Authority any microbial toolbox options as specified in Table 38 used to comply with treatment requirements under OAR 333-061-0032(2)(c), (3)(e) through (g), and (4)(g). Alternatively, the Authority may approve a water system to operate within required parameters for treatment credit rather than reporting monthly operational data for toolbox options.¶
- (q) Water systems must report the use of uncovered finished water storage facilities to the Authority as described in OAR 333-061-0032(11).¶
- (r) Water suppliers must report analyses of special samples for coliform bacteria to the Authority upon request.¶
- (s) Reporting violations.¶
- (A) Failure to report coliform sampling results as required by OAR 333-061-0036(6) after monitoring was properly conducted in a timely manner is a violation of this rule.¶
- (B) Failure to submit a completed coliform investigation report form after conducting an investigation or failure to ensure a coliform investigation report is submitted following a level 2 coliform investigation is a violation of this rule.¶
- (C) Failure to notify the Authority following an E. coli-positive sample as required by paragraph (1)(c)(C) of this rule is a violation of this rule.¶
- (D) Failure to certify and report completion of an Authority-approved start-up procedure at a seasonal water system as required by subsection (1)(n) of this rule is a violation of this rule.¶
- (2) Record Maintenance by Water Suppliers:¶
- (a) Water suppliers of public water systems shall retain records relating to the quality of the water produced and the condition of the physical components of the system. These records shall be kept at a convenient location within or near the area served by the water system;¶
- (b) Records of microbiological analyses shall be kept for at least five years. Records of chemical analyses, secondary contaminants, turbidity, radioactive substances, and monitoring plans shall be kept for at least 10 years. Data may be transferred to tabular summaries provided the following information is included:¶
- (A) Date, place and time of sampling, and the name of the person who collected the sample;¶
- (B) Identification of the sample as to whether it was a routine finished water sample, repeat sample, raw water sample or special purpose sample;¶
- (C) Date and time of the analysis, the laboratory and person performing the analysis; and,¶
- (D) Analytical method used and results of the analysis.¶
- (c) Records of actions taken to correct items of non-compliance shall be kept for at least three years after the last action taken with respect to the particular violation;¶
- (d) Reports, summaries or communications on sanitary surveys shall be kept for at least 10 years;¶
- (e) Records concerning variances or permits shall be kept for at least five years after the expiration of the variance or permit;¶
- (f) Records of residual disinfectant measurements shall be kept for at least two years.¶
- (g) All public water systems subject to the requirements of subsection (1)(g) of this rule shall retain the original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, Authority determinations, and any other information required for no fewer than 12 years.¶
- (h) Copies of public notices issued pursuant to OAR 333-061-0042 and certifications made to the Authority must be kept for three years after issuance.¶
- (i) For water systems using surface water or groundwater under the direct influence of surface water that use conventional filtration treatment or direct filtration treatment and that recycle spent filter backwash water, thickener, supernatant, or liquids from dewatering processes, water suppliers must collect and retain on file recycle flow information specified in paragraphs (2)(i)(A) through (F) of this rule for review and evaluation by the Authority:¶
- (A) Copy of the recycle notification and information submitted to the Authority as required by OAR 333-061-0032(10);¶
- (B) List of all recycle flows and the frequency with which they are returned;¶
- (C) Average and maximum backwash flow rate through the filters and the average and maximum duration of the filter backwash process in minutes;¶
- (D) Typical filter run length and a written summary of how filter run length is determined;¶
- (E) The type of treatment provided for the recycle flow;¶
- (F) Data on the physical dimensions of the equalization or treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals used and average dose and frequency of use, and frequency at which solids are removed, if applicable.¶
- (j) Water suppliers must maintain the following information in their records relating to water systems using groundwater sources:¶
- (A) Documentation of corrective actions for a period of not less than 10 years;¶
- (B) Documentation of notice to the public as prescribed by OAR 333-061-0042(8) for a period of not less than

three years;¶

(C) Records of decisions made in accordance with OAR 333-061-0036(6)(i)(A)(iv) and records of invalidation of E. coli -positive groundwater source samples in accordance with OAR 333-061-0036(6)(l) for a period of not less than five years;¶

(D) For purchasing water systems, documentation of notification to the wholesale system(s) of total-coliform positive samples not invalidated in accordance under OAR 333-061-0036(6)(a)(F) for a period of not less than five years; and¶

(E) For any water system ~~required to perform where~~ compliance monitoring in accordance with ~~required according to~~ OAR 333-061-0036(11)(b):¶

(i) Records of the Authority-specified minimum disinfectant residual for a period of not less than ten years;¶

(ii) Records of the lowest daily residual disinfectant concentration and records of the date and duration of any failure to maintain the Authority-prescribed minimum residual disinfectant concentration for a period of more than four hours for a period of not less than five years; and¶

(iii) Records of Authority-specified compliance requirements for membrane filtration, parameters specified by the Authority for Authority-approved alternative treatment, and records of the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operating requirements for more than four hours for a period of not less than five years.¶

(k) For systems required to compile a disinfection profile, the results of the profile (including raw data and analysis) must be kept indefinitely as well as the disinfection benchmark (including raw data and analysis) determined from the profile.¶

(l) Recordkeeping requirements pertaining to Cryptosporidium protection. Water systems must keep:¶

(A) Results from the source water monitoring prescribed by OAR 333-061-0036(5)(e) for three years after bin classification in accordance with OAR 333-061-0032(4)(f) for filtered systems, or determination of the mean Cryptosporidium level in accordance with OAR 333-061-0032(2)(c) for unfiltered systems for the particular round of monitoring.¶

(B) Any notification to the Authority that they will not conduct source water monitoring due to meeting the criteria specified in OAR 333-061-0036(5)(e)(D) for three years.¶

(C) The results of treatment monitoring associated with microbial toolbox options as prescribed by OAR 333-061-0032(13) through (17) and with uncovered finished water reservoirs in accordance with OAR 333-061-0032(11)(b), as applicable, for three years.¶

(m) IDSE reports (including Authority modifications) must be kept for at least 10 years. IDSE standard monitoring plans and IDSE system specific study plans must be retained at least as long as the IDSE report or any Authority modifications, whichever is longer. IDSE reports and any Authority modification must be made available for review by the Authority or the public.¶

(n) Water systems must retain a complete copy of any 40/30 certification submitted to the EPA for 10 years after the date the certification was submitted. The certification, all data upon which the certification is based, and any EPA notification must be available for review by the Authority or the public.¶

(o) Water suppliers must maintain any coliform investigation form, regardless of who conducts the investigation, and documentation of corrective actions completed as a result of those investigations, or other available summary documentation of the sanitary defects and corrective actions taken as specified in OAR 333-061-0078 for Authority review. This record must be maintained for a period not less than five years after completion of the coliform investigation or corrective action, whichever is later.¶

(p) Water suppliers must maintain a record of any repeat sample collected that meets Authority criteria for an extension of the 24-hour period for collecting repeat samples as provided for in OAR 333-061-0036(6)(g).

Statutory/Other Authority: ORS 448.131

Statutes/Other Implemented: ORS 448.273, ORS 448.150

AMEND: 333-061-0050

RULE SUMMARY: Amend OAR 333-061-0050: The Construction Standards rule was amended to specify that piping which bypasses water treatment must have a physical gap to prevent untreated water from being delivered to users, to clarify rule text for disinfection after repair of water pipes and to clarify when review of standards at Oregon very small water systems is required.

CHANGES TO RULE:

333-061-0050

Construction Standards ¶¶

(1) General:¶¶

(a) These standards shall apply to the construction of new public water systems and to major additions or modifications to existing public water systems and are intended to assure that the system facilities, when constructed, will be free of public health hazards and will be capable of producing water which consistently complies with the MCLs;¶¶

(b) Facilities at public water systems must comply with the construction standards in place at the time the facility was constructed or installed for use at a public water system. A public water system shall not be required to undertake alterations to existing facilities, unless the standard is listed as a significant deficiency as prescribed in OAR 333-061-0076(4) or if MCLs are being exceeded.¶¶

(c) Non-public and Oregon very small water systems that are converted to community, NTNC or TNC public water systems shall must be modified as necessary to conform to the requirements of this rule.¶¶

(d) Facilities at public water systems shall be designed and constructed in a manner such that contamination will be effectively excluded, and the structures and piping will be capable of safely withstanding external and internal forces acting upon them;¶¶

(e) Only materials designed for potable water service and meeting NSF Standard 61: Drinking Water System Components - Health Effects or equivalent shall be used in those elements of the water system which are in contact with potable water;¶¶

(f) New tanks, pumps, equipment, pipe valves and fittings shall be used in the construction of new public water systems, major additions or modifications to existing water systems. The Authority may permit the use of used items when it can be demonstrated that they have been renovated and are suitable for use in public water systems;¶¶

(g) Prior to construction of new facilities, the water supplier shall submit plans to the Authority for approval as specified in OAR 333-061-0060(1)(a).¶¶

(h) Construction may deviate from the requirements of this section provided that documentation is submitted, to the satisfaction of the Authority, that the deviation is equal to or superior to the requirements of this section as specified in OAR 333-061-0055 (variances from construction standards).¶¶

(i) A public water system or other Responsible Management Authority using groundwater, or groundwater under the direct influence of surface water, derived from springs, confined or unconfined wells that wish to have a state certified wellhead protection program shall comply with the requirements as specified in OAR 333-061-0057, 0060, and 0065, as well as OAR 340-040-0140 through 0200. Additional technical information is available in the Oregon Wellhead Protection Guidance Manual.¶¶

(j) As used in this rule, the following definitions apply:¶¶

(A) "Confined well" means a well that is constructed to draw water from a confined aquifer. More specifically, it is a well which produces water from a formation that is overlain by a low permeability material such as clay or unfractured consolidated rock such that the water-level in the well rises above the top of the aquifer. This well shall be constructed according to OAR chapter 690, division 200 "Water Supply Well Construction Standards."¶¶

(B) "Impermeable material" means a material that limits the passage of water.¶¶

(C) "Impounding reservoir" means an uncovered body of water formed behind a dam across a river or stream, and in which water is stored.¶¶

(D) "Pilot study" means the construction and operation of a scaled down treatment system during a given period of time to determine the feasibility of a full-scale treatment facility.¶¶

(E) "Sensitivity" means the intrinsic characteristics of a drinking water source such as depth to the aquifer for groundwater or highly erodible soils in a watershed that increase the potential for contamination to take place if a contaminant source is present.¶¶

(F) "Unconfined well" means a well that is constructed to draw water from an unconfined aquifer. More specifically, it is a well which produces water from a formation that is not overlain by a low permeability material such that the water-level in the well does not rise above the top of the aquifer. This well shall be constructed

according to OAR chapter 690, division 200 "Water Supply Well Construction Standards."¶

(k) All new groundwater sources, whether additional or modified wells or springs, are subject to consideration for potential direct influence of surface water as prescribed in OAR 333-061-0032(7).¶

(2) Groundwater:¶

(a) Wells:¶

(A) For the purpose of this rule, wells are defined as holes or other excavations that are drilled, dug or otherwise constructed for the purpose of capturing groundwater or groundwater in hydraulic connection where part of the water supplied by the collection system is derived, either naturally or induced, from a surface water source as a source of public drinking water.¶

(B) The area within 100 feet of the well shall be owned by the water supplier, or a perpetual restrictive easement shall be obtained by the water supplier for all land (with the exception of public rights-of-way) within 100 feet of the well. The easement shall be recorded with the county in which the well is located and with the recorded deed to the property. A certified true copy shall be filed with the Authority.¶

(C) For wells located on land owned by a public entity, (Federal, State, County, Municipality) where the entity is not the water supplier, a permit may be issued by the public entity to the water supplier in lieu of an easement. Said permit shall state that no existing or potential public health hazard shall be permitted within a minimum of 100 feet of a well site;¶

(D) Public or private roadways may be allowed within 100 feet of a confined well, provided the well is protected against contamination from surface runoff or hazardous liquids which may be spilled on the roadway and is protected from unauthorized access;¶

(E) The following sanitary hazards are not allowed within 100 feet of a well which serves a public water system unless waived by the Authority: any existing or proposed pit privy, subsurface sewage disposal drain field; cesspool; solid waste disposal site; pressure sewer line; buried fuel storage tank; animal yard, feedlot or animal waste storage; untreated storm water or gray water disposal; chemical (including solvents, pesticides and fertilizers) storage, usage or application; fuel transfer or storage; mineral resource extraction, vehicle or machinery maintenance or long term storage; junk/auto/scrap yard; cemetery; unapproved well; well that has not been properly abandoned or of unknown or suspect construction; source of pathogenic organisms or any other similar public health hazards. No gravity sewer line or septic tank shall be permitted within 50 feet of a well which serves a public water system. Clearances greater than indicated above shall be provided when it is determined by the Authority that the aquifer sensitivity and degree of hazard require a greater degree of protection. Above-ground fuel storage tanks provided for emergency water pumping equipment may be exempted from this requirement by the Authority provided that a secondary containment system is in place that will accommodate 110 percent of the fuel tank storage.¶

(F) Wells shall not be located at sites which are prone to flooding. In cases where the site is subject to flooding, the area around the well shall be mounded, and the top of the well casing shall be extended at least two feet above the anticipated 100-year (1 percent) flood level;¶

(G) Except as otherwise provided herein, wells shall be constructed in accordance with the general standards for the construction and maintenance of water wells in Oregon as prescribed in OAR chapter 690, divisions 200 through 220;¶

(H) Wells as defined in paragraph (2)(a)(A) of this rule that are less than 12 feet in depth must be constructed so as to be cased and sealed from the surface to a minimum of three feet above the bottom of the well. The casing may consist of concrete or metal culvert pipe or other pre-approved materials. The seal shall be watertight, be a minimum of four inches in thickness and may consist of cement, bentonite or concrete (see concrete requirements prescribed in OAR 690-210-315). The construction and placement of these wells must comply with all requirements of this rule.¶

(I) Before a well is placed into operation as the source of supply at a public water system, laboratory reports as required by OAR 333-061-0036 shall be submitted by the water supplier;¶

(J) Water obtained from wells which exceed the MCLs shall be treated as outlined in section (4) of this rule;¶

(K) The pump installation, piping arrangements, other appurtenances, and well house details at wells which serve as the source of supply for a public water system, shall meet the following requirements:¶

(i) The line shaft bearings of turbine pumps shall be water-lubricated, except that bearings lubricated with non-toxic approved food-grade lubricants may be permitted in wells where water-lubricated bearings are not feasible due to depth to the water;¶

(ii) Where turbine pumps are installed, the top of the casing shall be sealed into the pump motor. Where submersible pumps are installed, the top of the casing shall be provided with a watertight sanitary seal;¶

(iii) A casing vent shall be provided and shall be fitted with a screened return bend;¶

(iv) Provisions shall be made for determining the depth to water surface in the well under pumping and static conditions;¶

(v) A sampling tap shall be provided on the pump discharge line;¶

- (vi) Piping arrangements shall include provisions for pumping the total flow from the well to waste;¶
- (vii) A method of determining the total output of each well shall be provided. This requirement may be waived by the Authority at confined wells which serve as the source of supply for TNCs;¶
- (viii) A reinforced concrete slab shall be poured around the well casing at ground surface. The slab shall be sloped to drain away from the casing;¶
- (ix) The ground surface around the well slab shall be graded so that drainage is away from the well;¶
- (x) The top of the well casing shall extend at least 12 inches above the concrete slab;¶
- (xi) Provisions shall be made for protecting pump controls and other above-ground appurtenances at the well head. Where a wellhouse is installed for this purpose, it shall meet applicable building codes and shall be insulated, heated and provided with lights, except that where the wellhouse consists of a small removable box-like structure the requirement for lights may be waived by the Authority;¶
- (xii) The wellhouse shall be constructed so that the well pump can be removed.¶
- (xiii) Wells equipped with pitless adaptors or units are not required to meet the requirements of subparagraphs (2)(a)(~~E~~K)(iii) and (viii) of this rule.¶
- (L) The area in the vicinity of a well, particularly the area uphill or upstream, shall be surveyed by the water supplier to determine the location and nature of any existing or potential public health hazards;¶
- (M) The requirements with respect to land ownership, clearances from public health hazards, and protection against flooding for wells in an unconfined aquifer shall be the same or more restrictive than those prescribed for wells in confined aquifers, as determined by the Authority.¶
- (N) Before a well is placed into operation as the source of supply for a public water system, the following documents shall be submitted by the water supplier:¶
  - (i) Reports on pumping tests for yield and drawdown for unconfined wells;¶
  - (ii) Reports of laboratory analyses on contaminants in the water as required by OAR 333-061-0036;¶
  - (iii) Performance data on the pumps and other equipment;¶
  - (iv) Proposals for disinfection as required by section (5) of this rule, if applicable.¶
  - (v) Reports on determination of potential direct influence by surface water into groundwater source as prescribed in section (3) of this rule.¶
- (b) Springs:¶
  - (A) In addition to those requirements under subsection (2)(a) of this rule, construction of spring supplies shall meet the following requirements:¶
    - (i) An intercepting ditch shall be provided above the spring to effectively divert surface water;¶
    - (ii) A fence shall be installed around the spring area unless other provisions are made to effectively prevent access by animals and unauthorized persons;¶
    - (iii) The springbox shall be constructed of concrete or other impervious durable material and shall be installed so that surface water is excluded;¶
    - (iv) The springbox shall be provided with a screened overflow which discharges to daylight, an outlet pipe provided with a shutoff valve, a bottom drain, an access manhole with a tightly fitting cover, and a curb around the manhole.¶
    - (v) Spring collection facilities that meet the definition of a well in paragraph (2)(a)(A) of this rule must comply with construction requirements specified in paragraph (2)(a)(~~H~~H) of this rule.¶
  - (B) Reports on flow tests shall be provided to establish the yield of springs.¶
- (3) Surface water and groundwater under direct surface water influence source facilities:¶
  - (a) In selecting a site for an infiltration gallery, or for a direct intake from a stream, lake, or impounding reservoir, consideration shall be given to land use in the watershed. A sanitary survey of the watershed shall be made by the water supplier to evaluate natural and man-made factors which may affect water quality and investigations shall also be made of seasonal variations in water quality and quantity. A report giving the results of this survey shall be submitted for review and approval by the Authority.¶
  - (b) A determination shall be made as to the status of water rights, and this information shall be submitted to the Authority for review.¶
  - (c) Impounding reservoirs shall be designed and constructed so that they include the following features:¶
    - (A) The capacity shall be sufficient to meet projected demands during drought conditions;¶
    - (B) Outlet piping shall be arranged so that water can be withdrawn from various depths;¶
    - (C) Facilities shall be provided for releasing undesirable water.¶
  - (d) Direct intake structures shall be designed and constructed so that they include the following features:¶
    - (A) Screens shall be provided to prevent fish, leaves and debris from entering the system;¶
    - (B) Provisions shall be made for cleaning the screens, or self-cleaning screens shall be installed;¶
    - (C) Motors and electrical controls shall be located above flood level;¶
    - (D) Provisions shall be made to restrict swimming and boating in the vicinity of the intake;¶
    - (E) Valves or sluice gates shall be installed at the intake to provide for the exclusion of undesirable water when

required.¶

(4) Water treatment facilities (other than disinfection):¶

(a) General:¶

(A) Water treatment facilities shall be capable of producing water which consistently does not exceed MCLs. The type of treatment shall depend on the raw water quality. The Authority shall make determinations of treatment capabilities based upon recommendations in the US EPA Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources.¶

(B) Investigations shall be undertaken by the water supplier prior to the selection or installation of treatment facilities to determine the physical, chemical and microbiological characteristics of the raw water as appropriate. These investigations shall include a determination of the seasonal variations in water quality, as well as a survey to identify potential sources of contamination which may affect the quality of the raw water.¶

(C) Water obtained from wells constructed in conformance with the requirements of these rules and which is found not to exceed the MCLs, may be used without treatment at public water systems:¶

(D) Laboratory equipment shall be provided so that the water supplier can perform analyses necessary to monitor and control the treatment processes.¶

(E) Sampling taps shall be provided before and following the treatment process and before the first user when any form of water treatment is used at a public water system.¶

(F) Piping that bypasses required treatment facilities must have a physical gap between pipes that carry treated and untreated water.¶

(b) Best Available Technology:¶

(A) Pilot studies or other supporting data shall be used to demonstrate the effectiveness of any treatment method other than that defined as a BAT. Pilot study protocol shall be approved beforehand by the Authority. When point-of-use (POU) or point-of-entry (POE) devices are used for compliance, programs to ensure proper long-term operation, maintenance, and monitoring shall be provided by the water system to ensure adequate performance.¶

(B) The Authority identifies the following as the BAT, treatment techniques, or other means available for achieving compliance with the MCLs for volatile organic chemicals:¶

(i) Central treatment using packed tower aeration for all these chemicals.¶

(ii) Central treatment using GAC for all these chemicals except vinyl chloride.¶

(C) The Authority identifies the following as the BAT, treatment techniques or other means generally available for achieving compliance with the MCL for fluoride.¶

(i) Activated alumina absorption, centrally applied.¶

(ii) Reverse osmosis, centrally applied.¶

(D) The Authority identifies the following as the BAT, treatment techniques, or other means available for achieving compliance with the MCL for E. coli as specified in OAR 333-061-0030(4).¶

(i) Protection of wells from fecal contamination by appropriate placement and construction.¶

(ii) Maintenance of a disinfectant residual throughout the distribution system.¶

(iii) Proper maintenance of the distribution system including appropriate pipe replacement and repair procedures, main flushing programs, proper operation and maintenance of storage tanks and reservoirs, cross connection control and maintaining a minimum pressure of 20 psi at all service connections.¶

(iv) Filtration treatment or disinfection of surface water or GWUDI or disinfection of groundwater using strong oxidants such as chlorine, chlorine dioxide, or ozone.¶

(v) For systems using only groundwater, compliance with the requirements of an Authority approved wellhead protection program.¶

(E) The Authority identifies the following as the BAT, treatment techniques, or other means available for achieving compliance with the MCLs for organic chemicals.¶

(i) Central treatment using packed tower aeration for Ddibromochloropropane, Eethylene Ddibromide, Hhexachlorocyclopentadiene and Ddi(2-ethylhexyl)adipate.¶

(ii) Central treatment using GAC for all these chemicals except Ftrihalomethanes and Gglyphosate.¶

(iii) Central treatment using oxidation (chlorination or ozonation) for Gglyphosate.¶

(F) The Authority identifies the following as the BAT, treatment techniques, or other means available for achieving compliance with the MCLs for inorganic chemicals. Preoxidation may be required to convert Arsenic III to Arsenic V.¶

(i) Central treatment using coagulation/filtration for systems with 500 or more service connections for Aantimony, Aarsenic V (for systems with populations 501-10,000), Aasbestos, Bberyllium, Ccadmium, Cchromium, Mmercury (influent concentration e 10ug/L), and Sselenium (Sselenium IV only).¶

(ii) Central treatment using direct and diatomite filtration for Aasbestos.¶

(iii) Central treatment using GAC for Mmercury.¶

(iv) Central treatment using activated alumina for Aarsenic V (for systems with populations 10,000 or less), Bberyllium, Sselenium and Fthallium.¶

- (v) Central treatment using ion exchange for Arsenic V (for systems with populations 10,000 or less), Barium, Beryllium, Cadmium, Chromium, Cyanide, Nickel, Nitrate, Nitrite and Thallium.¶
  - (vi) Central treatment using lime softening for systems with 500 or more service connections for Arsenic V (for systems with populations of 501-10,000), Barium, Beryllium, Cadmium, Chromium (Chromium III only), Mercury (influent concentration  $\leq 10\mu\text{g/L}$ ), Nickel and Selenium.¶
  - (vii) Central treatment using reverse osmosis for Antimony, Arsenic V (for systems with populations of 501-10,000), Barium, Beryllium, Cadmium, Chromium, Cyanide, Mercury (influent concentration  $\leq 10\mu\text{g/L}$ ), Nickel, Nitrate, Nitrite, and Selenium.¶
  - (viii) Central treatment using corrosion control for Asbestos and Lead and Copper.¶
  - (ix) Central treatment using electro dialysis for Arsenic V (for systems with populations of 501-10,000), Barium, Nitrate, and Selenium.¶
  - (x) Central treatment using alkaline chlorination ( $\text{pH} \leq 8.5$ ) for Cyanide.¶
  - (xi) Central treatment using coagulation-assisted microfiltration for Arsenic V (for systems with populations 501-10,000).¶
  - (xii) Central treatment using oxidation/filtration for Arsenic V (to obtain high removals, iron to Arsenic ratio must be at least 20:1).¶
  - (xiii) Point-of-use treatment using activated alumina for Arsenic V (for systems with populations 10,000 or less).¶
  - (xiv) Point-of-use treatment using reverse osmosis for Arsenic V (for systems with populations 10,000 or less).¶
- (G) The Authority identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the MCLs for disinfection byproducts:¶
- (i) For bromate concentrations: control of ozone treatment process to reduce production of bromate.¶
  - (ii) For chlorite concentrations: control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.¶
  - (iii) For TTHM and HAA5, for water systems that disinfect their source water and monitor in accordance with OAR 333-061-0036(4)(c) or (d): enhanced coagulation or enhanced softening plus GAC in filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days, except that the reactivation frequency for GAC for compliance with OAR 333-061-0030(2)(b) shall be 120 days; or nanofiltration with a molecular weight cutoff less than or equal to 1000 Daltons; or GAC in filter beds with an empty-bed contact time of 20 minutes based on average daily flow and a carbon reactivation frequency of every 240 days.¶
  - (iv) For TTHMs and HAA5, for purchasing water systems with populations greater than or equal to 10,000 and that monitor in accordance with OAR 333-061-0036(4)(c) or (d) improved distribution system and storage tank management to reduce residence time, plus the use of chloramines for disinfectant residual maintenance. This applies only to the disinfected water that purchasing water systems receive from a wholesale system.¶
  - (v) For TTHMs and HAA5, for purchasing water systems with populations less than 10,000 and that monitor in accordance with OAR 333-061-0036(4)(c) or (d): improved distribution system and storage tank management to reduce residence time. This applies only to the disinfected water that purchasing water systems receive from a wholesale system.¶
- (H) The Authority identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the MRDLs: Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.¶
- (I) The Authority identifies the following as the BAT, treatment techniques, or other means available for achieving compliance with the MCLs for radionuclides.¶
- (i) Central treatment using ion exchange for combined radium-226/228, beta particle/photon activity and uranium.¶
  - (ii) Central treatment using reverse osmosis for combined radium-226/228, gross alpha particle activity, beta particle/photon activity, and uranium (for systems with populations 501-10,000).¶
  - (iii) Central treatment using lime softening for combined radium-226/228, and uranium (for systems with populations 501-10,000).¶
  - (iv) Central treatment using enhanced coagulation/filtration for uranium.¶
  - (v) Central treatment using activated alumina for uranium (for systems with populations of 10,000 or less).¶
  - (vi) Central treatment using greensand filtration for combined radium-226/228.¶
  - (vii) Central treatment using electro dialysis for combined radium-226/228.¶
  - (viii) Central treatment using pre-formed hydrous manganese oxide filtration for combined radium-226/228.¶
  - (ix) Central treatment using co-precipitation with barium for combined radium-226/228.¶
  - (x) Point-of-use treatment using ion exchange for combined radium-226/228, beta particle/photon activity, and uranium.¶
  - (xi) Point-of use treatment using reverse osmosis for combined radium-226/228, gross alpha particle activity, beta

particle/ photon activity, and uranium (for systems with populations of 10,000 or less).¶

(c) Filtration of ~~S~~surface ~~W~~water ~~S~~sources and ~~G~~groundwater ~~S~~sources ~~U~~nder the ~~D~~irect ~~I~~nfluence of ~~S~~surface ~~W~~water.¶

(A) All water systems using surface water or groundwater sources under the direct influence of surface water that fail to meet the criteria for avoiding filtration prescribed in OAR 33-061-0032(2) and (3) must meet all requirements of this subsection for installing filtration treatment.¶

(B) There are four standard filtration methods: conventional filtration, direct filtration, slow sand, and diatomaceous earth. Other filtration technologies are only acceptable if their efficiency at removing target organisms and contaminants can be demonstrated to be equal to or more efficient than these. The assumed log removals credited to filtration of *Giardia lamblia* and viruses will be based on recommendations in the US EPA Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources. In all cases, filtration processes must be designed and operated to achieve at least 2.0 log removal of *Giardia lamblia*. For membrane filtration, removal credits shall be verified by a challenge study according to paragraphs (4)(c)(H) and (I) of this rule. Bag and ~~C~~ cartridge Filtration must have removal credits demonstrated in a challenge study according to paragraph (4)(c)(J) of this rule. The combination of filtration and disinfection must meet the inactivation levels prescribed in OAR 333-061-0032(1). Any water system wishing to challenge the assumed log removal credits must conduct demonstration studies based on the recommendations in the USEPA SWTR Guidance Manual and have the study protocol approved by the Authority.¶

(C) Pilot studies shall be conducted by the water supplier to demonstrate the effectiveness of any filtration method other than conventional filtration. Pilot study protocol shall be approved in advance by the Authority. Results of the pilot study shall be submitted to the Authority for review and approval.¶

(D) Regardless of the filtration method used, the water system must achieve a minimum of 0.5-log reduction of *Giardia lamblia* and a 1.0-log reduction of viruses from disinfection alone after filtration treatment.¶

(E) All filtration systems shall be designed and operated so as to meet the requirements prescribed in OAR 333-061-0032(4) and (5). Design of the filtration system must be in keeping with accepted standard engineering references acknowledged by the Authority such as the Great Lakes Upper Mississippi River "Recommended Standards for Water Works" technical reports by the International Reference Center for Community Water Supply and Sanitation, or publications from the World Health Organization. A list of additional references is available from the Authority upon request.¶

(F) Requirements for water systems using conventional or direct filtration.¶

(i) Systems that employ multiple filters shall be designed such that turbidity measurements are monitored for each filter independently of the other filter(s). Each filter shall have a provision to discharge effluent water as waste.¶

(ii) All water treatment plants shall have an auto-dial call out alarm or an automatic shut-off for high turbidity.¶

(G) Additional requirements for membrane filtration. Each membrane filter system must have a turbidimeter installed after each filter unit for continuous indirect integrity monitoring. Once operating, direct and indirect integrity testing must be conducted on each unit as described in OAR 333-061-0036(5)(d). The operation and maintenance manual must include a diagnosis and repair plan such that the ability to remove pathogens is not compromised.¶

(H) Challenge Study criteria for Membrane Filtration. Water systems receive *Cryptosporidium* treatment credit for membrane filtration, as defined in OAR 333-061-0020(59)(f), that meets the criteria of this paragraph. The level of treatment credit a water system receives is equal to the lower of the values determined in this paragraph.¶

(i) The removal efficiency demonstrated during challenge testing conducted under the conditions in accordance with paragraph (4)(c)(I) of this rule.¶

(ii) The maximum removal efficiency that can be verified through direct integrity testing of the membrane filtration process under the conditions prescribed by OAR 333-061-0036(5)(d)(B).¶

(I) Challenge Testing. The membrane filter used by the water system must undergo challenge testing to evaluate removal efficiency, and results of the challenge testing must be reported to the Authority. Challenge testing must be conducted according to the criteria specified in this paragraph. Water systems may use data from challenge testing conducted prior to June 1, 2009 if the prior testing was consistent with the criteria specified in this paragraph.¶

(i) Challenge testing must be conducted on a full-scale membrane module, identical in material and construction to the membrane modules used in the water system's treatment facility, or a smaller-scale membrane module, identical in material and similar in construction to the full-scale module. A module is defined as the smallest component of a membrane unit in which a specific membrane surface area is housed in a device with a filtrate outlet structure.¶

(ii) Challenge testing must be conducted using *Cryptosporidium* oocysts or a surrogate that is removed no more efficiently than *Cryptosporidium* oocysts. *Cryptosporidium* or the surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate, in both the feed and



filtrate water, must be determined using a method capable of discretely quantifying the specific challenge particulate used in the test; gross measurements such as turbidity may not be used.¶

(iii) The maximum feed water concentration that can be used during a challenge test is based on the detection limit of the challenge particulate in the filtrate and must be determined according to the following equation:¶

Maximum Feed Concentration =  $3.16 \times 10^6 \times (\text{Filtrate Detection Limit})$ .¶

(iv) Challenge testing must be conducted according to representative hydraulic conditions at the maximum design flux and maximum design process recovery specified by the manufacturer for the membrane module. Flux is defined as the throughput of a pressure driven membrane process expressed as flow per unit of membrane area. Recovery is defined as the volumetric percent of feed water that is converted to filtrate over the course of an operating cycle uninterrupted by events such as chemical cleaning or a solids removal process (that is, backwashing).¶

(v) Removal efficiency of a membrane module must be calculated from the challenge test results and expressed as a log removal value according to the following equation:¶

$LRV = \text{LOG}_{10}(C_f) - \text{LOG}_{10}(C_p)$ ¶

Where:¶

LRV = log removal value demonstrated during the challenge test;¶

$C_f$  = the feed concentration measured during the challenge test; and¶

$C_p$  = the filtrate concentration measured during the challenge test. Equivalent units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, the term  $C_p$  is set equal to the detection limit for the purpose of calculating the LRV. An LRV must be calculated for each membrane module evaluated during the challenge test.¶

(vi) The removal efficiency of a membrane filtration process demonstrated during challenge testing must be expressed as a log removal value (LRVC-Test). If fewer than 20 modules are tested, then LRVC-Test is equal to the lowest of the representative LRVs among the modules tested. If 20 or more modules are tested, then LRVC-Test is equal to the 10th percentile of the representative LRVs among the modules tested. The percentile is defined by  $(i/(n+1))$ , where  $i$  is the rank of  $n$  individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.¶

(vii) The challenge test must establish a quality control release value (QCRV) for a non-destructive performance test that demonstrates the Cryptosporidium removal capability of the membrane filtration module. This performance test must be applied to each production membrane module used by the system that was not directly challenge tested in order to verify Cryptosporidium removal capability. Production modules that do not meet the established QCRV are not eligible for the treatment credit demonstrated during the challenge test.¶

(viii) If a previously tested membrane is modified in a manner that could change the removal efficiency of the membrane or the applicability of the non-destructive performance test and associated QCRV, additional challenge testing to demonstrate the removal efficiency of, and determine a new QCRV for, the modified membrane must be conducted and submitted to the Authority.¶

(J) Challenge Study requirements for Bag and Cartridge Filtration.¶

(i) The Cryptosporidium treatment credit awarded to bag or cartridge filters must be based on the removal efficiency demonstrated during challenge testing that is conducted according to the criteria specified in this paragraph. A factor of safety equal to 1-log for individual bag or cartridge filters and 0.5-log for bag or cartridge filters in series must be applied to challenge testing results to determine removal credit. Water systems may use results from challenge testing conducted prior to June 1, 2009 if the prior testing was consistent with the criteria specified in this paragraph.¶

(ii) Challenge testing must be performed on full-scale bag or cartridge filters and the associated filter housing or pressure vessel, that are identical in material and construction to the filters and housings the water system will use for removal of Cryptosporidium. Bag or cartridge filters must be challenge tested in the same configuration that the system will use, either as individual filters or as a series configuration of filters.¶

(iii) Challenge testing must be conducted using Cryptosporidium or a surrogate that is removed no more efficiently than Cryptosporidium. The microorganism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate must be determined using a method capable of discretely quantifying the specific microorganism or surrogate used in the test; gross measurements such as turbidity may not be used.¶

(iv) The maximum feed water concentration that can be used during a challenge test must be based on the detection limit of the challenge particulate in the filtrate (that is, filtrate detection limit) and must be calculated using the following equation:¶

Maximum Feed Concentration =  $1 \times 10^4 \times (\text{Filtrate Detection Limit})$ .¶

(v) Challenge testing must be conducted at the maximum design flow rate for the filter as specified by the manufacturer.¶

(vi) Each filter evaluated must be tested for a duration sufficient to reach 100 percent of the terminal pressure

drop, which establishes the maximum pressure drop under which the filter may be used to comply with the requirements of this paragraph.¶

(vii) Removal efficiency of a filter must be determined from the results of the challenge test and expressed in terms of log removal values using the following equation:¶

$$\text{LRV} = \text{LOG}_{10}(\text{C}_f) - \text{LOG}_{10}(\text{C}_p).¶$$

Where:¶

LRV = log removal value demonstrated during challenge testing;¶

C<sub>f</sub> = the feed concentration measured during the challenge test; and¶

C<sub>p</sub> = the filtrate concentration measured during the challenge test. In applying this equation, the same units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, then the term C<sub>p</sub> must be set equal to the detection limit.¶

(viii) Each filter tested must be challenged with the challenge particulate during three periods over the filtration cycle: within two hours of start-up of a new filter; when the pressure drop is between 45 and 55 percent of the terminal pressure drop; and at the end of the cycle after the pressure drop has reached 100 percent of the terminal pressure drop. An LRV must be calculated for each of these challenge periods for each filter tested. The LRV for the filter (LRV<sub>filter</sub>) must be assigned the value of the minimum LRV observed during the three challenge periods for that filter.¶

(ix) If fewer than 20 filters are tested, the overall removal efficiency for the filter product line must be set equal to the lowest LRV<sub>filter</sub> among the filters tested. If 20 or more filters are tested, the overall removal efficiency for the filter product line must be set equal to the 10th percentile of the set of LRV<sub>filter</sub> values for the various filters tested. The percentile is defined by  $(i/(n+1))$  where *i* is the rank of *n* individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.¶

(x) If a previously tested filter is modified in a manner that could change the removal efficiency of the filter product line, challenge testing to demonstrate the removal efficiency of the modified filter must be conducted and submitted to the Authority.¶

(K) Water systems using cartridge filtration must have pressure gauges installed before and after each cartridge filter.¶

(L) Water systems using diatomaceous earth filtration must add the body feed with the influent flow.¶

(d) Criteria and procedures for public water systems using point-of-entry (POE) or point-of-use (POU) devices.¶

(A) Public water systems may use POE or POU devices to comply with MCLs, where specified in subsection (4)(b) of this rule, only if they meet the requirements of this subsection.¶

(B) It is the responsibility of the public water system to operate and maintain the POE or POU treatment system.¶

(C) The public water system must develop and obtain Authority approval for a monitoring plan before POE or POU devices are installed for compliance. Under the plan approved by the Authority, POE or POU devices must provide health protection equivalent to central water treatment. "Equivalent" means that the water would meet all MCLs as prescribed in OAR 333-061-0030 and would be of acceptable quality similar to water distributed by a well-operated central treatment plant. Monitoring must include contaminant removal efficacy, physical measurements and observations such as total flow treated and mechanical condition of the treatment equipment.¶

(D) Effective technology must be properly applied under a plan approved by the Authority and the microbiological safety of the water must be maintained.¶

(i) The water supplier must submit adequate certification of performance, field testing, and, if not included in the certification process, a rigorous engineering design review of the POE or POU devices to the Authority for approval prior to installation.¶

(ii) The design and application of the POE or POU devices must consider the tendency for increase in heterotrophic bacteria concentrations in water treated with activated carbon. It may be necessary to use frequent backwashing, post-contractor disinfection, and Heterotrophic Plate Count monitoring to ensure that the microbiological safety of the water is not compromised.¶

(iii) The POE or POU device must be evaluated to assure that the device will not cause increased corrosion of lead and copper bearing materials located between the device and the tap that could increase contaminant levels of lead and copper at the tap.¶

(E) All consumers shall be protected. Every building connected to the system must have a POE or POU device installed, maintained, and adequately monitored. The Authority must be assured that every building is subject to treatment and monitoring, and that the rights and responsibilities of the public water system customer convey with title upon sale of property.¶

(5) Facilities for disinfection and disinfectant residual maintenance:¶

(a) Water obtained from surface sources or groundwater sources under the direct influence of surface water shall, as a minimum, be provided with disinfection for pathogen inactivation before such water may be used as a source of supply for a public water system. Water obtained from wells constructed in conformance with the requirements

- of these rules and which is found not to exceed microbiological MCLs, may be used without treatment at public water systems;¶
- (b) Water obtained from wells and springs shall be considered groundwater unless determined otherwise by the Authority. Wells and springs may be utilized without disinfection if the construction requirements of section (2) of this rule are met and analyses indicate that the water consistently meets microbiological standards. A well or spring that is inadequately constructed must be upgraded to meet current construction standards or disconnected from the water system before disinfection treatment may be utilized when E. coli contamination was confirmed according to OAR 333-061-0032(7) or OAR 333-061-0036(6)(j) and where the Authority determines that reconstruction will add a significant measure of public health protection.¶
- (c) In public water systems where disinfection for pathogen inactivation is required as the sole form of treatment or as one component of more extensive treatment to meet the requirements prescribed in OAR 333-061-0032(1), the facilities shall be designed so that:¶
- (A) The disinfectant applied shall be capable of effectively destroying pathogenic organisms;¶
- (B) The disinfectant is applied in proportion to water flow; and¶
- (C) Disinfectants, other than ultraviolet light (UV) and ozone, shall be capable of leaving a residual in the water which can be readily measured and which continues to serve as an active disinfectant. The disinfectant shall be applied at every entry point so a residual is present throughout the distribution system; and¶
- (D) Sufficient contact time shall be provided to achieve "CT" values capable of the inactivation required by OAR 333-061-0032(1). For UV disinfection treatment, sufficient irradiance expressed in milliwatts per square centimeter (mWs/cm<sup>2</sup>) and exposure time expressed in seconds shall be provided to achieve UV dose levels expressed as (mWs/cm<sup>2</sup>) or millijoules per square centimeter (mJ/cm<sup>2</sup>) capable of the inactivation required by OAR 333-061-0032(1).¶
- (d) When disinfection for pathogen inactivation, other than UV disinfection, is required for reasons other than the treatment of surface water sources or groundwater sources under the direct influence of surface water, in addition to the requirements of paragraphs (5)(c)(A) through (C) of this rule, the facilities shall be designed so that:¶
- (A) The primary disinfection treatment is sufficient to ensure at least 99.99 percent (4-log) inactivation or removal of viruses as determined by the Authority, or;¶
- (B) There is sufficient contact time provided to achieve disinfection under all flow conditions between the point of disinfectant application and the point of first water use:¶
- (i) When chlorine is used as the primary disinfectant, the system shall be constructed to achieve a free chlorine residual of 0.2 mg/l after 30 minutes contact time under all flow conditions before first water use;¶
- (ii) When ammonia is added to the water with the chlorine to form a chloramine as the disinfectant, the system shall be constructed to achieve a combined chlorine residual of at least 2.0 mg/l after three hours contact time under all flow conditions before first water use;¶
- (e) Provisions shall be made to alert the water supplier before the chlorine supply is exhausted. Water systems serving more than 3,300 people shall have an auto-dial call out alarm or an automatic shut-off for low chlorine residual when chlorine is used as a disinfectant.¶
- (f) Sample taps shall be provided before and after disinfectant application as specified in subsection (4)(a)(E) of this rule;¶
- (g) Testing equipment shall be provided to determine the chlorine residual;¶
- (h) Chlorinator piping shall be designed to prevent the contamination of the potable water system by backflow of untreated water or water having excessive concentrations of chlorine;¶
- (i) The disinfectant must be applied in proportion to water flow;¶
- (j) Chlorine gas feeders and chlorine gas storage areas shall:¶
- (A) Be enclosed and separated from other operating areas;¶
- (B) Chlorine cylinders shall be restrained in position to prevent upset by chaining 100 and 150 pound cylinders two-thirds of their height up from the floor and by double chocking one ton cylinders;¶
- (C) The room housing the feeders and cylinders shall be above ground surface, shall have doors which open outward and to the outside and shall be ventilated by mechanical means at floor level and shall have an air intake located higher than the exhaust ventilation;¶
- (D) Be located so that chlorine gas, if released, will not flow into the building ventilation systems;¶
- (E) Have corrosion resistant lighting and ventilation switches located outside the enclosure, adjacent to the door;¶
- (F) Be provided with a platform or hydraulic scale for measuring the weight of the chlorine cylinders;¶
- (G) Be provided with a gas mask or self-contained breathing apparatus approved by the National Institute of Occupational Safety and Health (NIOSH) for protection against chlorine gas and kept in good working condition. Storage of such equipment shall be in an area adjoining the chlorine room and shall be readily available. (Also see the Oregon Occupational Health and Safety regulations contained in OAR chapter 437.)¶
- (k) When disinfection for pathogen inactivation is provided through UV disinfection, the facilities shall be designed

to meet the requirements of this subsection:¶

(A) The UV unit must achieve the dosage indicated in OAR 333-061-0036, Table 32 for the required pathogen inactivation.¶

(B) Ultraviolet lamps are insulated from direct contact with the influent water and are removable from the lamp housing;¶

(C) The treatment unit must have an upstream valve or device that prevents flows from exceeding the manufacturer's maximum rated flow rate, a UV sensor that monitors light intensity through the water during operation, and a visual and audible alarm;¶

(D) There must be a visual means to verify operation of all ultraviolet lamps;¶

(E) The lamps, lamp sleeves, housings and other equipment must be able to withstand the working pressures applied through the unit;¶

(F) The treatment facility must be sheltered from the weather and accessible for routine maintenance as well as routine cleaning and replacement of the lamp sleeves and cleaning of the sensor windows/lenses;¶

(G) The lamps must be changed as per the manufacturer's recommendation; and¶

(H) The treatment unit must have shut-off valves at both the inlet side and the outlet side of the treatment unit. There shall be no bypass piping around the treatment unit.¶

(I) Reactor validation testing. All water systems, except those specified in paragraph (5)(I) of this rule, must use UV reactors that have undergone validation testing to determine the operating conditions under which the reactor delivers the UV dose required in OAR 333-061-0036(5)(c) (that is, validated operating conditions). These operating conditions must include flow rate, UV intensity as measured by a UV sensor, UV Transmittance based on reactor validation, and UV lamp status.¶

(i) When determining validated operating conditions, water systems must account for the following factors: UV absorbance by the water; lamp fouling and aging; measurement uncertainty of on-line sensors; UV dose distributions arising from the velocity profiles through the reactor; failure of UV lamps or other critical system components; and inlet and outlet piping or channel configurations of the UV reactor.¶

(ii) Validation testing must include the following: full scale testing of a reactor that conforms uniformly to the UV reactors used by the water system and inactivation of a test microorganism whose dose response characteristics have been quantified with a low pressure mercury vapor lamp.¶

(iii) The Authority may approve an alternative approach to validation testing.¶

(I) At non-Community water systems using only groundwater sources and having minimal distribution systems as determined by the Authority, water suppliers may use UV as the only disinfectant when total coliforms but no E. coli have been detected in the source water. UV units must meet the specifications of a Class A UV system according to NSF Standard 55.¶

(6) Finished water storage:¶

(a) Distribution reservoirs and treatment plant storage facilities for finished water shall be constructed to meet the following requirements:¶

(A) They shall be constructed of concrete, steel, wood or other durable material capable of withstanding external and internal forces which may act upon the structure;¶

(B) Ground-level reservoirs shall be constructed on undisturbed soil, bedrock or other stable foundation material capable of supporting the structure when full;¶

(C) Steel reservoirs, standpipes and elevated tanks shall be constructed in conformance with the AWWA Standards D100 and D103;¶

(D) Concrete reservoirs shall be provided with sufficient reinforcing to prevent the formation of cracks, and waterstops and dowels shall be placed at construction joints. Poured-in-place wall castings shall be provided where pipes pass through the concrete;¶

(E) Wooden reservoirs shall be redwood or other equally durable wood and shall be installed on a reinforced concrete base. Where redwood reservoirs are used, separate inlet and outlet pipes are required and the water entering the reservoir must have a disinfectant continuously applied so as to result in a detectable residual in the water leaving the reservoir;¶

(F) Start-up procedures for new redwood tanks shall consist of filling the tank with a solution of water containing a minimum of two pounds of sodium carbonate per 1,000 gallons of water and retaining this solution in the tank a minimum of seven days before flushing;¶

(G) Where ground-level reservoirs are located partially below ground, the bottom shall be above the ground water table and footing drains discharging to daylight shall be provided to carry away ground water which may accumulate around the perimeter of the structure;¶

(H) The finished water storage capacity shall be increased to accommodate fire flows when fire hydrants are provided;¶

(I) Finished water storage facilities shall have watertight roofs;¶

(J) An access manhole shall be provided to permit entry to the interior for cleaning and maintenance. When the

access manhole is on the roof of the reservoir there shall be a curbing around the opening and a lockable watertight cover that overlaps the curbing;¶

(K) Internal ladders of durable material, shall be provided where the only access manhole is located on the roof;¶

(L) Screened vents shall be provided above the highest water level to permit circulation of air above the water in finished water storage facilities;¶

(M) A drain shall be provided at the lowest point in the bottom of the storage facility and an overflow of sufficient diameter to handle the maximum flow into the tank shall be provided at or near the top of the sidewall. The outlet ends of the drain and overflow shall be fitted with angle-flap valves or equivalent protection and shall discharge to a watercourse or storm drain capable of accommodating the flow with a vertical separation between the bottom of the pipe and top of the receiving body or structure;¶

(N) A silt stop shall be provided at the outlet pipe;¶

(O) Where a single inlet/outlet pipe is installed and the reservoir floats on the system, provisions shall be made to insure an adequate exchange of water and to prevent degradation of the water quality and to assure the disinfection levels required in subparagraph (5)(c)(D) of this rule;¶

(P) A fence or other method of vandal deterrence shall be provided around distribution reservoirs;¶

(Q) When interior surfaces of finished water storage tanks are provided with a protective coating, the coating shall meet the requirements of NSF Standard 61: Drinking Water System Components - Health Effects or equivalent.¶

(R) Reservoirs and clearwells that are to be used for disinfection contact time to treat surface water shall use a tracer study to determine the actual contact time. The Authority must approve procedures and protocols for the tracer study prior to the initiation of the study. The Authority recommends the US EPA Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources for a tracer study procedure and protocol.¶

(S) Reservoirs and clearwells that are to be used for disinfection contact time to treat surface water shall have a means to adequately determine the flow rate on the effluent line.¶

(b) Pressure tanks for finished water shall meet the following requirements:¶

(A) Pressure tanks shall be installed above normal ground surface;¶

(B) Bypass piping around the pressure tank shall be provided to permit operation of the system while the tank is being maintained or repaired;¶

(C) Pressure tanks greater than 1,000 gallons shall be provided with an access manhole and a water sight-glass.¶

(D) All pressure tanks shall be provided with a drain, a pressure gauge, an air blow-off valve, means for adding air and pressure switches for controlling the operation of the pump(s);¶

(E) Pressure tanks shall be constructed of steel or an alternative material provided the tank is NSF 61 certified and shall be designed for pressure at least 50 percent greater than the maximum system pressure anticipated.¶

(7) Pumping facilities:¶

(a) Wherever possible, booster pumps shall take suction from tanks and reservoirs to avoid the potential for negative pressures on the suction line which result when the pump suction is directly connected to a distribution main;¶

(b) Pumps which take suction from distribution mains for the purpose of serving areas of higher elevation shall be provided with a low pressure cut-off switch on the suction side set at no less than 20 psi;¶

(c) Suction lift at pumping stations shall be avoided as far as possible, and pumps shall be installed so that the suction line is under a positive head. If suction lift cannot be avoided, provision shall be made for priming with water which does not exceed MCLs;¶

(d) Pumping stations shall be located above maximum anticipated 100-year (1 percent) flood level, and the area around the pumping station shall be graded so that surface drainage is away from the station;¶

(e) Pumping stations shall be of durable construction so as to protect the equipment from the elements. The door to the pumping station shall be lockable, and facilities for heating and lighting shall be provided. The floor of the pumping station shall be sloped to provide adequate drainage.¶

(8) Distribution systems:¶

(a) Wherever possible, distribution pipelines shall be located on public property. Where pipelines are required to pass through private property, easements shall be obtained from the property owner and shall be recorded with the county clerk;¶

(b) Pipe, pipe fittings, valves and other appurtenances utilized at Community water systems shall be manufactured, installed and tested in conformance with the latest standards of the American Water Works Association, NSF International or other equivalent standards acceptable to the Authority;¶

(c) In Community water systems, distribution mains located in public roadways or easements, and the portion of the service connections from the distribution main to the customer's property line or service meter where provided are subject to the requirements of these rules. The piping from the customer's property line, or the meter where provided, to the point of water use (the building supply line) is subject to the requirements of the

State Plumbing Code;¶

(d) In all Public Water Systems where the system facilities and the premises being served are both on the same parcel of property, requirements relating to pipe materials and pipe installation shall comply with the State Plumbing Code;¶

(e) Distribution piping shall be designed and installed so that the pressure measured at the property line in the case of Community water systems, or at the furthest point of water use, in the case of a TNC of the type described in subsection (d) of this section, shall not be reduced below 20 psi;¶

(f) Distribution piping shall be carefully bedded and fully supported in material free from rocks and shall be provided with a cover of at least 30 inches. Select backfill material shall be tamped in layers around and over the pipe to support and protect it. Large rocks or boulders shall not be used as backfill over the pipe;¶

(g) Provision shall be made at all bends, tees, plugs, and hydrants to prevent movement of the pipe or fitting;¶

(h) Wherever possible, dead ends shall be minimized by looping. Where dead ends are installed, or low points exist, blow-offs of adequate size shall be provided for flushing;¶

(i) Air-relief valves shall be installed at high points where air can accumulate. The breather tube on air-relief valves shall be extended above ground surface and provided with a screened, downward facing elbow;¶

(j) Yarn, oakum, lead or other material which may impair water quality shall not be used where it will be in contact with potable water;¶

(k) Nonconductive water pipe (plastic or other material) that is not encased in conductive pipe or casing must have an electrically conductive wire or other approved conductor for locating the pipe when the pipeline is underground. The wire shall be No. 18 AWG (minimum) solid copper with blue colored insulation. Ends of wire shall be accessible in water meter boxes, valve boxes or casings, or outside the foundation of buildings where the pipeline enters the building. The distance between tracer lead access locations shall not be more than 1,000 feet. Joints or splices in wire shall be waterproof.¶

(l) Piping that is to be used for disinfection contact time shall be verified by plug flow calculations under maximum flow conditions. Plug flow, in this context, means the movement of water in a pipe such that particles pass through the pipe and are discharged in the same sequence in which they entered.¶

(9) Crossings-Sanitary sewers and water lines:¶

(a) All reference to sewers in this section shall mean sanitary sewers;¶

(b) In situations involving a water line parallel to a sewer main or sewer lateral, the separation between the two shall be as indicated in Figure 1;¶

(c) In situations where a water line and a sewer main or sewer lateral cross, the separation between the two shall be as follows:¶

(A) Wherever possible, the bottom of the water line shall be 1.5 feet or more above the top of the sewer line and one full length of the water line shall be centered at the crossing;¶

(B) Where the water line crosses over the sewer line but with a clearance of less than 1.5 feet, the sewer line shall be exposed to the sewer line joints on both sides of the crossing to permit examination of the sewer pipe. If the sewer pipe is in good condition and there is no evidence of leakage from the sewer line, the 1.5-foot separation may be reduced. However, in this situation, the water supplier must center one length of the water line at the crossing and must prepare a written report of the findings and indicating the reasons for reducing the separation. If the water supplier determines that the conditions are not favorable or finds evidence of leakage from the sewer line, the sewer line shall be replaced with a full length of pipe centered at the crossing point, of PVC pressure pipe (ASTM D-2241, SDR 32.5), high-density PE pipe (Drisco pipe 1000), ductile-iron Class 50 (AWWA C-51), or other acceptable pipe; or the sewer shall be encased in a reinforced concrete jacket for a distance of 10 feet on both sides of the crossing.¶

(C) Where the water line crosses under the sewer line, the water supplier shall expose the sewer line and examine it as indicated in paragraph (9)(c)(B) of this rule. If conditions are favorable and there is no evidence of leakage from the sewer line, the sewer line may be left in place, but special precautions must be taken to assure that the backfill material over the water line in the vicinity of the crossing is thoroughly tamped in order to prevent settlement which could result in the leakage of sewage. In this situation, the water supplier must center one length of the water line at the crossing and must prepare a written report recording the manner in which the sewer line was supported at the crossing and the material and methods used in backfilling and tamping to prevent settlement of the sewer. If the water supplier determines that conditions are not favorable or finds evidence of leakage from the sewer line, the provisions of paragraph (9)(c)(B) of this rule apply.¶

(d) When a water main is installed under a stream or other watercourse, a minimum cover of 30 inches shall be provided over the pipe. Where the watercourse is more than 15 feet wide, the pipe shall be of special construction with flexible watertight joints, valves shall be provided on both sides of the crossing so that the section can be isolated for testing or repair, and test cocks shall be provided at the valves.¶

(10) Disinfection of facilities:¶

(a) Following construction or installation of new facilities and repairs to existing facilities, those portions of the

facilities which will be in contact with water delivered to users must be cleaned and flushed with potable water and disinfected according to AWWA Standards C651 through C654 before they are placed into service.

Disinfection must be by chlorine unless another disinfectant can be demonstrated to be equally effective.¶

(b) For construction of new distribution pipelines (with any associated service connections and other appurtenances installed at the time of construction), disinfection by chlorination must be conducted as specified in paragraphs (A) through (C) of this subsection unless another method from AWWA Standard C651 is used.¶

(A) A solution with a free chlorine residual of at least 25 mg/l must be introduced to the pipe such that the solution will contact all surfaces and trapped air will be eliminated. The solution must remain in place for at least 24 hours.¶

(B) After 24 hours, if the free chlorine residual is 10 mg/l or greater, the chlorine solution must be drained and the pipe flushed with potable water. If the free chlorine residual is less than 10 mg/l after 24-hours, the pipe must be flushed and rechlorinated until a free chlorine residual of 10 mg/l or more is present after a 24 hour period.¶

(C) After the pipe is disinfected, flushed and filled with potable water, bacteriological samples must be collected to determine the procedures' effectiveness. At least two samples must be collected from the new pipe at least 16 hours apart and analyzed for coliform bacteria. If the pipe has held potable water for at least 16 hours before sample collection, two samples may be collected at least 15 minutes apart while the sample tap is left running. If the results of both analyses indicate the water is free of coliform bacteria, the pipe may be put into service. If either sample indicates the presence of coliform bacteria, the pipe may be re-flushed, filled with potable water and re-sampled. If this second set of samples is free of coliform bacteria, the pipe may be put into service, otherwise the disinfection and flushing process must be repeated until samples are free of coliform.¶

(c) For repaired pipelines that were depressurized and wholly or partly dewatered during repair or that likely experienced contamination during repair, ~~disinfection according to the procedure specified in paragraphs (10)(b)(A) through (C) of this rule must be followed except that~~ the affected pipes must be disinfected, flushed and refilled with potable water, and bacteriological samples must be collected downstream of the repair site. If the direction of flow is unknown, samples must be collected on each side of the repair site.¶

(d) A water line may be returned to service, following repairs or routine maintenance, prior to receiving a report on the bacteriological analysis if the following procedures have been completed:¶

(A) Customer meters were shut off prior to placing the water line out of service;¶

(B) The area below the water line to be repaired was excavated and dewatered;¶

(C) The exposed pipe was treated with a hypochlorite solution;¶

(D) The water line was flushed thoroughly, and a concentration of residual chlorine has been re-established that is comparable to the level normally maintained by the water system, if applicable; and¶

(E) Bacteriological analysis was conducted to verify repair effectiveness according to this section and samples were collected downstream of the repair site or on each side of the repair site if the direction of flow is unknown.¶

(e) For reservoirs and tanks, disinfection by chlorination shall be accomplished according to AWWA Standard C652 which includes, but is not limited to, the following methods:¶

(A) Filling the reservoir or tank and maintaining a free chlorine residual of not less than 10 mg/l for the appropriate 6 or 24 hour retention period; or¶

(B) Filling the reservoir or tank with a 50 mg/l chlorine solution and leaving for six hours; or¶

(C) Directly applying by spraying or brushing a 200 mg/l solution to all surfaces of the storage facility in contact with water if the facility were full to the overflow elevation.¶

(f) When the procedures described in paragraphs (10)(e)(A) and (B) of this rule are followed, the reservoir or tank shall be drained after the prescribed contact period and refilled with potable water, and a sample taken for microbiological analysis. If the results of the analysis indicate that the water is free of coliform organisms, the facility may be put into service. If not, the procedure shall be repeated until a sample free of coliform organisms is obtained;¶

(g) When the procedure described in paragraph (10)(e)(C) of this rule is followed, the reservoir or tank shall be filled with potable water and a sample taken for microbiological analysis. It will not be necessary to flush the reservoir or tank after the chlorine solution is applied by spraying or brushing. Microbiological analysis shall indicate that the water is free of coliform organisms before the facility can be put into service;¶

(h) When a reservoir is chlorinated following routine maintenance, inspection, or repair, it may be put back into service prior to receiving the report on the microbiological analysis provided the water leaving the reservoir has a free chlorine residual of at least 0.4 mg/l or a combined chlorine residual of at least 2.0 mg/l.¶

(i) Underwater divers used for routine maintenance, inspection, or repair of reservoirs shall use a full body dry suit with hardhat scuba and an external air supply. The diver shall be disinfected by spraying a 200 mg/l solution of chlorine on all surfaces that will come into contact with drinking water.

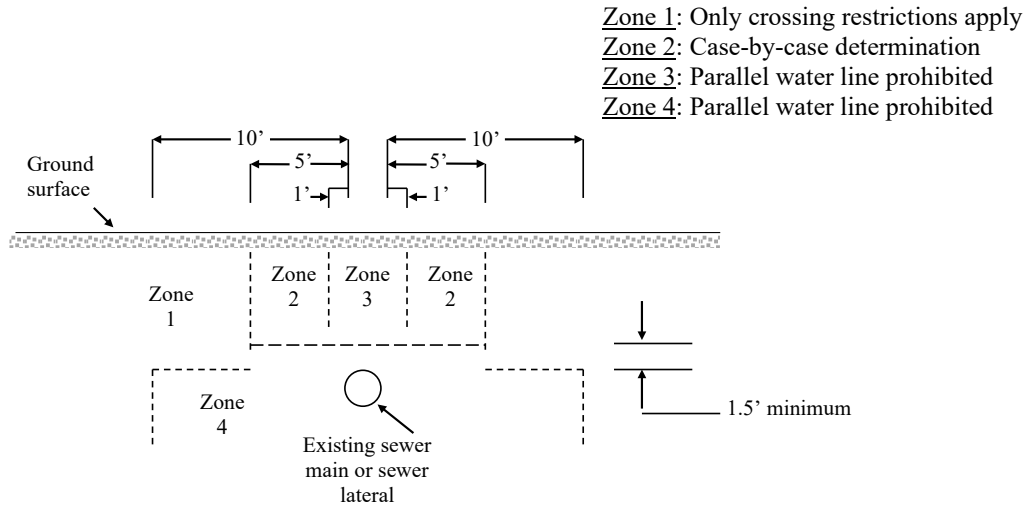
Statutory/Other Authority: ORS 448.131

Statutes/Other Implemented: ORS 448.131, 448.150, 448.273, 448.279

RULE ATTACHMENTS DO NOT SHOW CHANGES. PLEASE CONTACT AGENCY REGARDING CHANGES.



Figure 1: Water Line-Sewer Line Separation



AMEND: 333-061-0060

RULE SUMMARY: Amend OAR 333-061-0060: The Plan Submission and Review Requirements rule was amended to clarify fees for plan review and approval and to specify that corrosion control studies must be approved by the Authority prior to treatment installation.

CHANGES TO RULE:

333-061-0060

Plan Submission and Review Requirements ¶

(1) Plan Submission:¶

(a) Construction and installation plans shall be submitted to and approved by the Authority before construction begins on new systems or major additions or modifications, as determined by the Authority, are made to existing systems. Corrosion control studies conducted according to OAR 333-061-0034(3)(b) must be submitted to and approved by the Authority prior to installation of treatment. Plans shall be drawn to scale;¶

(b) Preliminary plans, pilot studies, master plans and construction plans shall be prepared by a Professional Engineer registered in Oregon, and submitted to the Authority unless exempted by the Authority (See OAR 333-061-0060(4));¶

(c) Plans shall set forth the following:¶

(A) Sufficient detail, including specifications, to completely and clearly illustrate what is to be constructed and how those facilities will meet the construction standards set forth in these regulations. Elevation or section views shall be provided where required for clarity;¶

(B) Supporting information attesting to the quality of the proposed source of water;¶

(C) Vicinity map of the proposed project relative to the existing system or established landmarks of the area;¶

(D) Name of the owner of the water system facilities during construction and the name of the owner and operator of the facilities after completion of the project;¶

(E) Procedures for cleaning and disinfecting those facilities which will be in contact with the potable water.¶

(d) Prior to drilling a well, a site plan shall be submitted which shows the site location, topography, drainage, surface water sources, specifications for well drilling, location of the well relative to sanitary hazards, dimensions of the area reserved to be kept free of potential sources of contamination, evidence of ownership or control of the reserve area and the anticipated depth of the aquifer from which the water is to be derived. The Authority will review well reports from the area and in consultation with the local watermaster and the well constructor as appropriate will recommend the depth of placement of the casing seal. After the well is drilled, the following documents shall be submitted to the Authority for review and approval: Well driller's report, report of the pump test which indicates that the well has been pumped for a sufficient length of time to establish the reliable yield of the well on a sustained basis, including data on the static water level, the pumping rate(s), the changes in drawdown over the duration of the test, the rate of recovery after the pump was turned off, reports on physical, chemical and microbiological quality of the well water, performance data on the well pump, a plan of the structure for protecting above-ground controls and appurtenances, and a plan showing how the well will be connected to the water system. (See OAR 333-061-0050(2)).¶

(e) Any community, NTNC, or TNC that treats surface water or groundwater under the influence of surface water and that desires to make a significant change to its disinfection treatment process as defined by paragraphs (1)(e)(A) through (1)(e)(D) of this rule, is required to develop a disinfection profile and calculate a disinfection benchmark according to OAR 333-061-0036(4)(e). The water system must consult with and provide any additional information requested by the Authority prior to making such a change. The water system must develop a disinfection profile for *Giardia lamblia* and viruses, calculate a disinfection benchmark, describe the proposed change in the disinfection process, and analyze the effect(s) of the proposed change on current levels of disinfection according to the USEPA Disinfection Profiling and Benchmarking Guidance Manual or the USEPA LT1-ESWTR Disinfection Profiling and Benchmarking Technical Guidance Manual and submit the information to the Authority for review and approval. Significant changes to the disinfection treatment process include:¶

(A) Changes to the point of application:¶

(B) Changes to the disinfectants used in the treatment process;¶

(C) Changes to the disinfection process;¶

(D) Any other modification identified by the Authority.¶

(f) A water system that uses either chloramines, chlorine dioxide, or ozone for primary disinfection, and that is required to prepare a disinfection profile for *Giardia lamblia* as prescribed by subsection (1)(e) of this rule, must also prepare a disinfection profile for viruses and calculate the logs of inactivation for viruses using the methods specified in OAR 333-061-0036(4)(l).¶

(2) Plan review:¶

(a) Upon receipt of plans, the Authority shall review the plans and either approve them or advise that correction or clarification is required. When the correction or clarification is received, and the item(s) in question are resolved, the Authority shall then approve the plans;¶

(b) Upon completion of a project, a professional engineer registered in Oregon shall submit to the Authority a statement certifying that the project has been constructed in compliance with the approved plans and specifications. When substantial deviations from the approved plans are made, as-built plans showing compliance with these rules shall be submitted to the Authority;¶

(c) Plans shall not be required for emergency repair of existing facilities. In lieu of plans, written notice shall be submitted to the Authority immediately after the emergency work is completed stating the nature of the emergency, the extent of the work and whether or not any threats to the water quality exists or existed during the emergency.¶

(3) Plan review fees: Plans submitted to the Authority ~~shall for review and approval must~~ be accompanied by a fee as indicated in Table 4.1. ~~Those plans not accompanied by a fee will not be reviewed.~~¶

(4) Plan review exemptions:¶

(a) Water suppliers may be exempted from submitting plans for water main extensions or replacements, providing they:¶

(A) Have provided the Authority with a current master plan; and¶

(B) Certify that the work will be carried out in conformance with the construction standards of these rules; and¶

(C) Submit to the Authority an annual summary of the projects completed, signed by a professional engineer currently registered in Oregon and certifying that all projects were completed according to OAR 333-061-0050; and¶

(D) Certify that they have staff qualified to effectively supervise the projects.¶

(b) Those water suppliers certifying that they have staff qualified to effectively plan, design and supervise their projects, may request the Authority for further exemption from this rule. Such requests must be accompanied by a listing of staff proposed to accomplish the work and a current master plan. To maintain the exemption, the foregoing must be annually updated;¶

(c) At the discretion of the Authority, ~~eCommunity, NTNC and TNC, TNC and State Regulated~~ water systems may be exempted from ~~the submission of~~ submitting engineered plans. ~~Water suppliers~~ They shall; however, submit adequate plans indicating that the project meets the minimum construction standards of these rules.¶

(5) A master plan is required for every community water system with 300 or more service connections or serving more than 1,000 people and shall be maintained by the water supplier for the duration of the period to which the plan applies. Master plans shall be prepared by a professional engineer registered in Oregon and submitted to the Authority for review and approval.¶

(a) Each master plan shall evaluate the needs of the water system for at least a twenty-year period and shall include, but not be limited to, the following elements:¶

(A) A summary of the overall plan that includes the water quality and service goals, identified present and future water system deficiencies, the engineer's recommended alternative for achieving the goals and correcting the deficiencies, and the recommended implementation schedule and financing program for constructing improvements.¶

(B) A description of the existing water system which includes the service area, source(s) of supply, status of water rights, current status of drinking water quality and compliance with regulatory standards, maps or schematics of the water system showing size and location of facilities, estimates of water use, and operation and maintenance requirements.¶

(C) A description of water quality and level of service goals for the water system, considering, as appropriate, existing and future regulatory requirements, nonregulatory water quality needs of water users, flow and pressure requirements, and capacity needs related to water use and fire flow needs.¶

(D) An estimate of the projected growth of the water system during the master plan period and the impacts on the service area boundaries, water supply source(s) and availability, and customer water use.¶

(E) An engineering evaluation of the ability of the existing water system facilities to meet the water quality and level of service goals, identification of any existing water system deficiencies, and deficiencies likely to develop within the master plan period. The evaluation shall include the water supply source, water treatment, storage, distribution facilities, and operation and maintenance requirements. The evaluation shall also include a description of the water rights with a determination of additional water availability, and the impacts of present and probable future drinking water quality regulations.¶

(F) Identification of alternative engineering solutions, environmental impacts, and associated capital and operation and maintenance costs, to correct water system deficiencies and achieve system expansion to meet anticipated growth, including identification of available options for cooperative or coordinated water system improvements with other local water suppliers.¶

- (G) A description of alternatives to finance water system improvements including local financing (such as user rates and system development charges) and financing assistance programs.¶
- (H) A recommended water system improvement program including the recommended engineering alternative and associated costs, maps or schematics showing size and location of proposed facilities, the recommended financing alternative, and a recommended schedule for water system design and construction.¶
- (I) If required as a condition of a water use permit issued by the Water Resources Department, the Master Plan shall address the requirements of OAR 690-086-0120 (Water Management and Conservation Plans).¶
- (J) A seismic risk assessment and mitigation plan for water systems fully or partially located in areas identified as VII to X, inclusive, for moderate to very heavy damage potential using the Map of Earthquake and Tsunami Damage Potential for a Simulated Magnitude 9 Cascadia Earthquake, Open File Report 0-13-06, Plate 7 published by the State of Oregon, Department of Geology and Mineral Industries.¶
- (i) The seismic risk assessment must identify critical facilities capable of supplying key community needs, including fire suppression, health and emergency response and community drinking water supply points.¶
- (ii) The seismic risk assessment must identify and evaluate the likelihood and consequences of seismic failures for each critical facility.¶
- (iii) The mitigation plan may encompass a 50-year planning horizon and include recommendations to minimize water loss from each critical facility, capital improvements or recommendations for further study or analysis.¶
- (b) The implementation of any portion of a water system master plan must be consistent with OAR 333-061 (Public Drinking Water Systems, Oregon Health Authority), OAR 660-011 (Public Facilities Planning, Department of Land Conservation and Development) and OAR 690-086 (Water Management and Conservation Plans, Water Resources Department).

Statutory/Other Authority: ORS 448.131

Statutes/Other Implemented: ORS 448.131

RULE ATTACHMENTS DO NOT SHOW CHANGES. PLEASE CONTACT AGENCY REGARDING CHANGES.

Plan Submission and Review Requirements

Table 41		
<u>Nature of Plan</u>	<u>Water System Classification</u>	
<u>Nature of Plan</u>	<u>Community <del>W</del>water <del>S</del>system (serving 300 or more connections)</u>	<u>Community <del>W</del>water <del>S</del>system (serving fewer than 300 connections) or <del>N</del>non-Community <del>W</del>water <del>S</del>system</u>
Water source	\$3,300	\$825
<u>Surface <del>W</del>water <del>T</del>reatment (full)filtration</u>	\$3,300	\$825
Disinfection <u>(including disinfectant residual maintenance)</u>	\$825	\$248
Corrosion <u>C</u> ontrol	\$825	\$248
<u>Treatment for a contaminant identified in OAR 333-061-0030(1), (2) or (5)</u>	<u>\$825</u>	<u>\$248</u>
Distribution	\$3,300	\$825
Storage	\$3,300	\$825
<u>Other</u>	<u>\$825</u>	<u>\$248</u>
Combination of two or more above	\$4,125	\$825
Master <u>P</u> lan	\$4,125	\$825
Corrosion <u>C</u> ontrol study	\$4,125	\$825
As-built plans & <u>re</u> certification statement	No fee if original plans reviewed	

AMEND: 333-061-0070

RULE SUMMARY: Amend OAR 333-061-0070: The Cross Connection Control Requirements rule was amended to improve rule text according to recommendations from the Oregon Cross Connection Advisory Board.

CHANGES TO RULE:

333-061-0070

Cross Connection Control Requirements ¶

- (1) Water suppliers ~~shall~~must undertake cross connection control programs to protect the public water systems from pollution and contamination.¶
- (2) For the purposes of this rule, the following definitions apply:¶
  - (a) "Pollutant" means a substance that creates an impairment of the quality of the water to a degree which does not create a hazard to the public health, but which does adversely affect the aesthetic qualities of the water.¶
  - (b) "Thermal expansion" means the pressure increase due to a rise in water temperature that occurs in water piping systems when such systems become "closed" by the installation of a backflow prevention assembly or other means, and will not allow for expansion beyond that point of installation.¶
- (3) The water supplier's responsibility for cross connection control ~~shall~~must begin at the water supply source, include all public treatment, storage, and distribution facilities under the water supplier's control, and end at the POD to the water user's premises.¶
- (4) Water suppliers ~~shall~~must develop and implement cross connection control programs that meet the minimum requirements set forth in these rules.¶
- (5) Water suppliers ~~shall~~must develop a procedure to coordinate cross connection control requirements with the appropriate local administrative authority having jurisdiction.¶
- (6) The water supplier ~~shall~~must ensure that inspections of approved air gaps, approved devices, and inspections and tests of approved backflow prevention assemblies protecting the public water system are conducted:¶
  - (a) By an Authority certified backflow assembly tester with a currently calibrated gauge;¶
  - ~~(b)~~ At the time of installation, ~~any~~ repair or relocation;¶
  - ~~(b)~~(c) At least annually once every 12 months after installation;¶
  - ~~(e)~~ More frequently than ~~annually~~every 12 months for approved backflow prevention assemblies that repeatedly fail, or are protecting health hazard cross connections, as determined by the water supplier;¶
  - ~~(d)~~ After a backflow incident; or¶
  - ~~(e)~~ After an approved air gap is re-plumbed.¶
- (7) Approved air gaps, approved devices, or approved backflow prevention assemblies, found not to be functioning properly ~~shall be~~must be flushed and cleaned, repaired, replaced or re-plumbed by the water user or premises owner, as defined in the water supplier's local ordinance or enabling authority, or the water supplier may take action in accordance with subsection (9)(a) of these rules.¶
- (8) A water user or premises owner who obtains water from a water supplier must notify the water supplier if they add any chemicals or substance to the water.¶
- (9) ~~P~~Mandatory premises isolation requirements:¶
  - (a) For service connections to premises listed or defined in Table 42 (Premises Requiring Isolation), the water supplier ~~shall~~must ensure an approved backflow prevention assembly or an approved air gap is installed;¶
  - (A) Premises with cross connections not listed or defined in Table 42 (Premises Requiring Premises Isolation), ~~shall~~must be individually evaluated. The water supplier ~~shall~~must require the installation of an approved backflow prevention assembly or an approved air gap commensurate with the degree of hazard on the premises, as defined in Table 43 (Backflow Prevention Methods);¶
  - (B) In lieu of premise isolation, the water supplier may accept an in-premises approved backflow prevention assembly as protection for the public water system when the approved backflow prevention assembly is installed, maintained and tested in accordance with these rules.¶
  - (C) Water suppliers may, on a case-by-case basis, provide an exemption to mandatory premises isolation requirements to premises listed on Table 42, if the premises contains no health hazards.¶
- (b) Where premises isolation is used to protect against a cross connection, the following requirements apply;¶
  - (A) The water supplier ~~shall~~must:¶
    - (i) Ensure the approved backflow prevention assembly is installed at a location adjacent to the service connection or POD;¶
    - (ii) Ensure any alternate location used must be with the approval of the water supplier and must meet the water supplier's cross connection control requirements; and¶
    - (iii) Notify the premises owner and water user, in writing, of thermal expansion concerns.¶
  - (B) The premises owner ~~shall~~must:¶

- (i) Ensure no cross connections exist between the POD from the public water system and the approved backflow prevention assemblies, when these are installed in an alternate location; and¶
- (ii) Assume responsibility for installation, testing, maintenance, and repair of the installed approved backflow prevention assembly to protect against the hazard.¶
- (c) Where unique conditions exist, but not limited to, extreme terrain or pipe elevation changes, or structures greater than three stories in height, even with no actual or potential health hazard, an approved backflow prevention assembly may be installed at the POD; and¶
- (d) Where the water supplier chooses to use premises isolation by the installation of an approved backflow prevention assembly on a one- or two-family dwelling under the jurisdiction of the Oregon Plumbing Specialty Code and there is no unprotected actual or potential cross connection, the water supplier shall must:¶
  - (A) Install the approved backflow prevention assembly at the POD;¶
  - (B) Notify the premises owner and water user in writing of thermal expansion concerns; and¶
  - (C) Take responsibility for installation, testing, maintenance and repair of the installed approved backflow prevention assembly.¶
- (10) In community water systems, water suppliers shall must implement a cross connection control program directly, or by written agreement with another agency experienced in cross connection control. The local cross connection program shall must consist of the following elements:¶
  - (a) Local ordinance or enabling authority that authorizes discontinuing water service to premises for:¶
    - (A) Failure to remove or eliminate an existing unprotected or potential cross connection;¶
    - (B) Failure to install a required approved backflow prevention assembly;¶
    - (C) Failure to maintain an approved backflow prevention assembly; or¶
    - (D) Failure to conduct the required testing of an approved backflow prevention assembly.¶
  - (b) A written program plan for community water systems with 300 or more service connections shall must include the following:¶
    - (A) A list of premises where health hazard cross connections exist, including, but not limited to, those listed in Table 42 (Premises Requiring Premises Isolation);¶
    - (B) Current records of approved backflow prevention assemblies installed, inspections completed, backflow prevention assembly test results on backflow prevention assemblies and verification of current Backflow Assembly Tester certification;¶
    - (C) A public education program about cross connection control;¶
    - (D) A current list of certified cross connection control staff members; and¶
    - (E) Written procedures for:¶
      - (i) Evaluating the degree of hazard posed by a water user's premises;¶
      - (ii) Notifying the water user if a non-health hazard or health hazard is identified, and for informing the water user of any corrective action required;¶
      - (iii) The type of protection required to prevent backflow into the public water supply, commensurate with the degree of hazard that exists on the water user's premises, as defined in Table 43 (Backflow Prevention Methods);¶
      - (iv) A description of what corrective actions will be taken if a water user fails to comply with the water supplier's cross connection control requirements;¶
  - (c) Current records of approved backflow prevention assemblies installed, inspections completed, backflow prevention assembly test results on into the public water supply, commensurate with the degree of hazard that exists on the water user's premises, as defined in Table 43 (Backflow Prevention assemblies and verification of current BMethods); and¶
  - (d) Ensuring backflow Assembly Tester certification; and¶
  - (e) A public education program about cross connection controls have current state tester certification.¶
- (c) The water supplier shall must prepare and submit a cross connection control Annual Summary Report to the Authority, on forms provided by the Authority, before the last working day of March each year.¶
- (d) In community water systems having 300 or more service connections, water suppliers shall must ensure at least one person is certified as a Cross Connection Control Specialist, unless specifically exempted from this requirement by the Authority.¶
- (11) Fees: Community water systems shall must submit to the Authority an annual cross connection program implementation fee, based on the number of service connections, as follows:¶
  - Service Connections - Fee:¶
    - 15-99 - \$30.¶
    - 100-999 - \$75.¶
    - 1,000-9,999 - \$200.¶
    - 10,000 or more - \$350.¶
- (a) Billing invoices will be mailed to water systems in the first week of November each year and are due by January

first of the following year;¶

(b) Fees are payable to Oregon Health Authority by check or money order;¶

(c) A late fee of 50 percent of the original amount will be added to the total amount due and will be assessed after January 31 of each year.¶

(12) In transient or NTNC water systems, the water supplier that owns or operates the system ~~shall~~must:¶

(a) Ensure no cross connections exist, or are isolated from the potable water system with an approved backflow prevention assembly, as required in section (13) of this rule;¶

(b) Ensure approved backflow prevention assemblies are installed at, or near, the cross connection; and¶

(c) Conduct an annual cross connection survey and inspection to ensure compliance with these rules, and test all backflow assemblies annually. All building permits and related inspections are to be made by the Department of Consumer and Business Services, Building Codes Division, as required by ORS 447.020.¶

(13) Approved backflow prevention assemblies and devices required under these rules ~~shall~~must be approved by the University of Southern California, Foundation for Cross-Connection Control and Hydraulic Research, or other equivalent testing laboratories approved by the Authority.¶

(14) Backflow prevention assemblies installed before the effective date of these rules that were approved at the time of installation, but are not currently approved, ~~shall~~must be permitted to remain in service provided the assemblies are not moved, the piping systems are not significantly remodeled or modified, the assemblies are properly maintained, and they are commensurate with the degree of hazard they were installed to protect. The assemblies must be tested at least annually and perform satisfactorily to the testing procedures set forth in these rules.¶

(15) Tests performed by Authority-certified Backflow Assembly Testers ~~shall~~must be in conformance with procedures established by the University of Southern California, Foundation for Cross Connection Control and Hydraulic Research, Manual of Cross-Connection Control, 10th Edition, or other equivalent testing procedures approved by the Authority.¶

(16) Backflow prevention assemblies ~~shall~~must be tested by Authority-certified Backflow Assembly Testers, ~~except as otherwise provided for journeyman plumbers or apprentice plumbers in as prescribed by OAR 333-061-0072 of these rules (Backflow Assembly Tester Certification).~~ The Backflow Assembly Tester must produce three copies of all test reports. One copy must be maintained in the Tester's permanent records, one copy must be provided to the water user or property owner, and one copy must be provided to the water supplier.¶

(a) Test reports must be provided within 10 working days; and¶

(b) The test reports must be in a manner and form acceptable to the water supplier.¶

(17) All approved backflow prevention assemblies subject to these rules ~~shall~~must be installed in accordance with OAR 333-061-0071 and the Oregon Plumbing Specialty Code.¶

(18) The Authority ~~shall~~must establish an advisory board for cross connection control issues consisting of not more than ~~nine~~10 members, and including representation from the following:¶

(a) Oregon licensed Plumbers;¶

(b) Authority certified Backflow Assembly Testers;¶

(c) Authority certified Cross Connection Specialists;¶

(d) Water Suppliers;¶

(e) The general public;¶

(f) Authority certified Instructors of Backflow Assembly Testers or Cross Connection Specialists;¶

(g) Backflow assembly manufacturers or authorized representatives;¶

(h) Engineers experienced in water systems, cross connection control or backflow prevention; ~~and~~¶

(i) Oregon certified Plumbing Inspectors; ~~and~~¶

(j) The Oregon Water Resources Department.

Statutory/Other Authority: ORS 448.131

Statutes/Other Implemented: ORS 448.131, 448.150, 448.278, 448.279

RULE ATTACHMENTS DO NOT SHOW CHANGES. PLEASE CONTACT AGENCY REGARDING CHANGES.



**333-061-0070**

**Cross Connection Control Requirements**

Table 42 High Hazard Table (Premises Requiring Premises Isolation* by an Approved Air Gap or a Reduced Pressure Principle Type of Assembly)
Agricultural (for example, farms, dairies)
Beverage bottling plants**
Car washes
Chemical plants
Commercial laundries and dry cleaners
Premises where both reclaimed and potable water are used
Film processing plants
Food processing plants
Medical centers (for example, hospitals, medical clinics, nursing homes, veterinary clinics, dental clinics, blood plasma centers)
Premises with irrigation systems that use the water supplier's water with chemical additions (for example, parks, playgrounds, golf courses, cemeteries, housing estates)
Laboratories
Metal plating industries
Mortuaries
Petroleum processing or storage plants
Piers and docks
Radioactive material processing plants and nuclear reactors
Wastewater lift stations and pumping stations
Wastewater treatment plants
Premises with piping under pressure for conveying liquids other than potable water and the piping is installed in proximity to potable water piping
Premises with an auxiliary water supply that is connected to a potable water supply
Premises where the water supplier is denied access or restricted access for survey
Premises where the water is being treated by the addition of chemical or other additives

\* Refer to OAR 333-061-0070(8) premises isolation requirements.

\*\* A DC could be used if the water supplier determines there is only a non-health hazard at a beverage bottling plant.

<b>Table 43</b>	
<b>Backflow Prevention Methods Used For Premises Isolation</b>	
<b>DEGREE OF IDENTIFIED HAZARD</b>	
<b>Non-Health Hazard, Low Risk (Pollutant)</b>	<b>Health Hazard, High Risk (Contaminant)</b>
<b>Backsiphonage or Backpressure</b>	<b>Backsiphonage or Backpressure</b>
Air Gap	Air Gap
Reduced Pressure Principle Backflow Prevention Assembly (RP)	Reduced Pressure Principle Backflow Prevention Assembly (RP)
Reduced Pressure Principle-Detector Backflow Prevention Assembly (RPDA)	Reduced Pressure Principle-Detector Backflow Prevention Assembly (RPDA)
Double Check Valve Backflow Prevention Assembly (DC)	
Double Check-Detector Backflow Prevention Assembly (DCDA)	

AMEND: 333-061-0071

RULE SUMMARY: Amend OAR 333-061-0071: Backflow Prevention Assembly Installation and Operation Standards rule was amended to improve the organization of rule text.

CHANGES TO RULE:

333-061-0071

Backflow Prevention Assembly Installation and Operation Standards ¶

(1) Any approved backflow prevention assembly required by OAR 333-061-0070 shall must be installed in a manner that:¶

(a) Facilitates its proper operation, maintenance, inspection, and in-line testing using standard installation procedures approved by the Authority, such as, but not limited to, University of Southern California, Manual of Cross-Connection Control, 10th Edition, the Pacific Northwest Section American Water Works Association, Cross Connection Control Manual, 7th Edition, ASSE 5000-2015, or the local administrative authority having jurisdiction;¶

(b) Precludes the possibility of continuous submersion of an approved backflow prevention assembly, and precludes the possibility of any submersion of the relief valve on a RP; and¶

(c) Maintains compliance with all applicable safety regulations and the Oregon Plumbing Specialty Code.¶

(2) For premises isolation installation:¶

(a) The approved backflow prevention assembly shall must be installed at a location adjacent to the service connection or POD; or¶

(b) Any alternate location must be with the advance approval of the water supplier and must meet the water supplier's cross connection control requirements; and¶

(c) The premises owner shall must ensure no cross connections exist between the POD from the public water system and the approved backflow prevention assembly.¶

(3) Bypass piping installed around any approved backflow prevention assembly must be equipped with an approved backflow prevention assembly to:¶

(a) Afford at least the same level of protection as the approved backflow prevention assembly being bypassed; and¶

(b) Comply with all requirements of these rules.¶

(4) All Oregon Plumbing Specialty Code approved residential multi-purpose fire suppression systems constructed of potable water piping and materials do not require a backflow prevention assembly.¶

(5) Stand-alone fire suppression systems, being a piping system within a premises intended to only serve as a fire protection system separated from the potable water system, shall must be protected commensurate with the degree of hazard, as defined in OAR 333-061-0070, Table 43 (Backflow Prevention Methods).¶

(6) Stand-alone irrigation systems shall must be protected commensurate with the degree of hazard, as defined in OAR 333-061-0070, Table 43 (Backflow Prevention Methods).¶

(7) A RP or RPDA: ~~(Figure 1, see attached)~~¶

~~(a) Shall~~¶

(a) Must conform to bottom and side clearances when the assembly is installed inside a building. Access doors may be provided on the top or sides of an above-ground vault;¶

(b) ~~Shall~~ Must always be installed horizontally, never vertically, unless they are specifically approved for vertical installation;¶

(c) ~~Shall~~ Must always be installed above the 100-year (1 percent) flood level unless approved by the appropriate local administrative authority having jurisdiction;¶

(d) ~~Shall~~ Must never have extended or plugged relief valves;¶

(e) ~~Shall~~ Must be protected from freezing when necessary;¶

(f) ~~Shall~~ Must be provided with an approved air gap drain;¶

(g) ~~Shall~~ Must not be installed in an enclosed vault or box unless a bore-sighted drain to daylight is provided where there is an unrestricted straight-line opening in the enclosure that vents to grade, and is sized and constructed to adequately drain the full flow discharge from the reduced pressure principle backflow prevention assembly thus preventing any potential for submersion of the assembly;¶

(h) May be installed with reduced clearances if the pipes are two inches in diameter or smaller, are accessible for testing and repairing, and approved by the appropriate local administrative authority having jurisdiction;¶

(i) ~~Shall~~ Must not be installed at a height greater than five feet unless there is a permanently installed platform meeting Oregon Occupational Safety and Health Administration (OR-OSHA) standards to facilitate servicing the assembly; and¶

(j) Be used to protect against a non-health hazard or health hazard for backsiphonage or backpressure

conditions.¶¶

(8) A DC or DCDA: ~~(Figure 2, see attached)~~¶¶

~~(a) Shall~~¶¶

(a) Must conform to bottom and side clearances when the assembly is installed inside a building;¶¶

(b) May be installed vertically as well as horizontally provided the assembly is specifically listed for that orientation in the Authority's Approved Backflow Prevention Assembly List.¶¶

(c) May be installed below grade in a vault, provided that water-tight fitted plugs or caps are installed in the test cocks, and the assembly shall ~~shall~~ must not be subject to continuous immersion;¶¶

(d) Shall ~~Shall~~ Must not be installed at a height greater than five feet unless there is a permanently installed platform meeting Oregon Occupational Safety and Health Administration (OR-OSHA) standards to facilitate servicing the assembly;¶¶

(e) May be installed with reduced clearances if the pipes are two inches in diameter or smaller, provided that they are accessible for testing and repairing, and approved by the appropriate local administrative authority having jurisdiction;¶¶

(f) Shall ~~Shall~~ Must have adequate drainage provided except that the drain shall ~~shall~~ must not be directly connected to a sanitary or storm water drain. Installers shall ~~shall~~ must check with the water supplier and appropriate local administrative authority having jurisdiction for additional requirements;¶¶

(g) Shall ~~Shall~~ Must be protected from freezing when necessary; and¶¶

(h) Be used to protect against non-health hazards under backsiphonage and backpressure conditions.¶¶

(9) A PVB or SVB shall: ~~(Figure 3, see attached)~~ must:¶¶

(a) Be installed where occasional water discharge from the assembly caused by pressure fluctuations will not be objectionable;¶¶

(b) Have adequate spacing available for maintenance and testing;¶¶

(c) Not be subject to flooding;¶¶

(d) Be installed a minimum of 12 inches above the highest downstream piping and outlets;¶¶

(e) Have absolutely no means of imposing backpressure by a pump or other means. The downstream side of the PVB or SVB may be maintained under pressure by a valve; and¶¶

(f) Be used to protect against non-health and health hazards and backsiphonage only, not backpressure.¶¶

(10) An Atmospheric Vacuum Breaker (AVB) shall: ~~(Figure 4, see attached)~~¶¶

~~(a) Have absolutely no means of shut-off on the downstream or discharge side of the AVB~~ must:¶¶

(a) Be installed in an upright position, and have an outlet open to atmosphere;¶¶

(b) Not be installed in dusty or corrosive atmospheres;¶¶

(c) Not be installed where subject to flooding;¶¶

(d) Be installed a minimum of six inches above the highest downstream piping and outlets;¶¶

(e) Be used intermittently;¶¶

(f) Have product and material approval under the Oregon Plumbing Specialty Code for non-testable devices.¶¶

(g) Not be pressurized for more than 12 hours in any 24-hour period; and¶¶

(h) Be used to protect against non-health or health hazards and backsiphonage only, not backpressure.

Statutory/Other Authority: ORS 448.131

Statutes/Other Implemented: 448.131, 448.150, 448.273, 448.279

RULE ATTACHMENTS DO NOT SHOW CHANGES. PLEASE CONTACT AGENCY REGARDING CHANGES.

Backflow Prevention Assembly Installation and Operation Standards

Figure 1

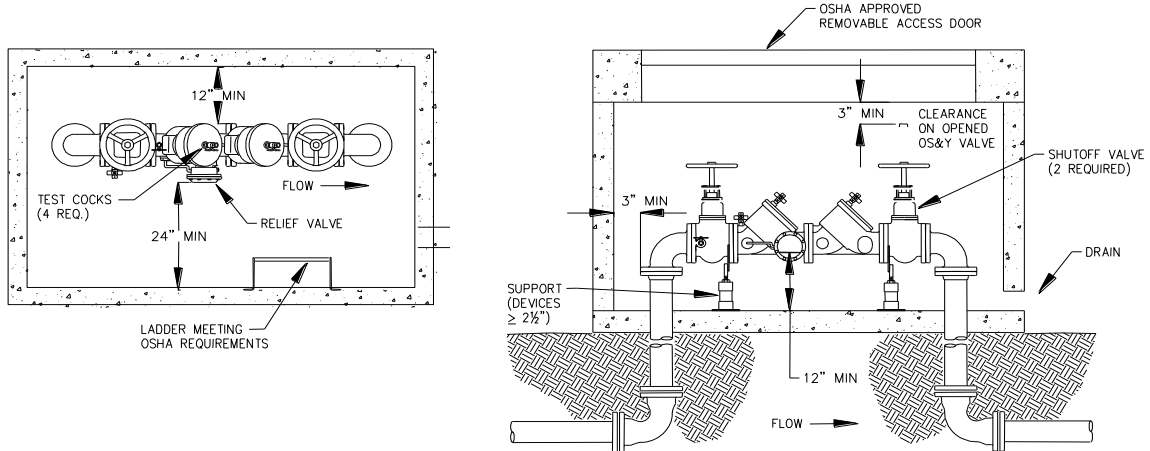


Figure 2

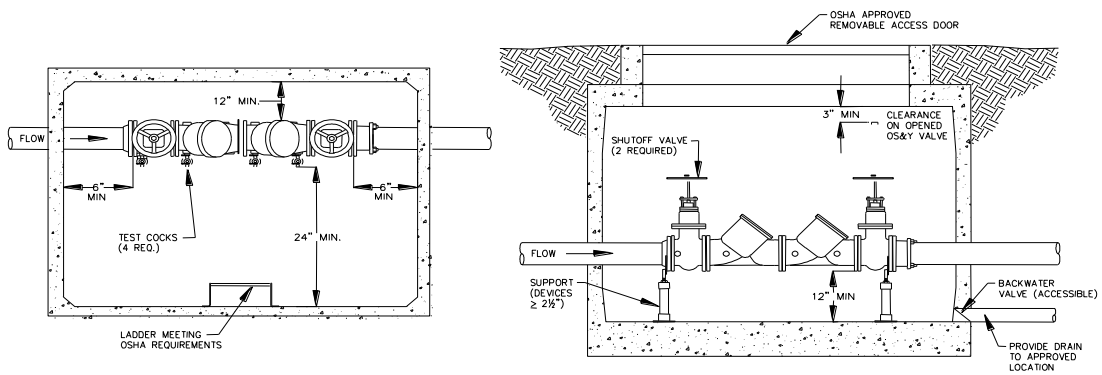


Figure 3

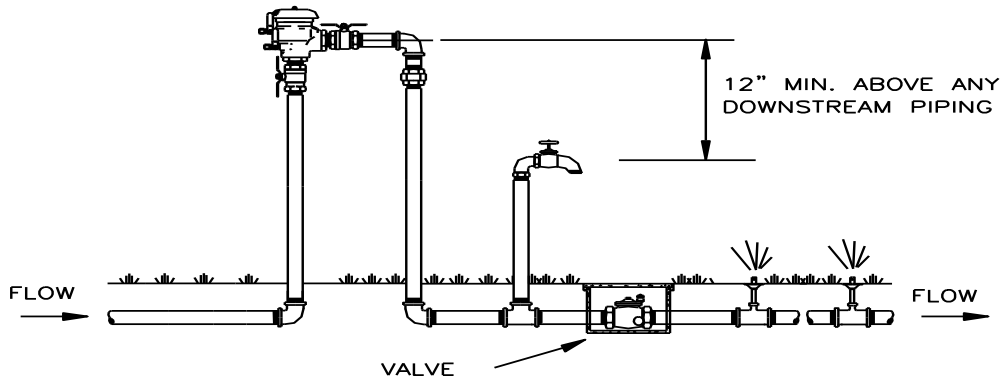
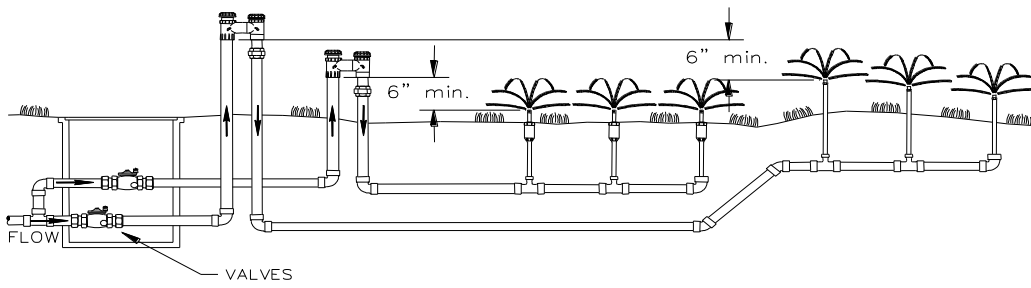


Figure 4



AMEND: 333-061-0072

RULE SUMMARY: Amend OAR 333-061-0072: The Backflow Assembly Tester Certification rule was amended to improve rule text according to recommendations from the Oregon Cross Connection Advisory Board.

CHANGES TO RULE:

333-061-0072

### Backflow Assembly Tester Certification ¶

(1) In order to be certified as a backflow assembly tester, individuals must successfully complete all the requirements of this rule for testing backflow prevention assemblies. Only the following individuals may perform the field-testing on backflow prevention assemblies required by these rules:¶

(a) Individuals certified by the Authority to test backflow prevention assemblies; and¶

(b) Journeyman plumbers defined as those who hold a certificate of competency issued under ORS Chapter 693 or apprentice plumbers, as defined under ORS 693.010.¶

(2) Journeyman plumbers or apprentice plumbers who test backflow prevention assemblies shall must satisfactorily complete an Authority approved backflow assembly tester training course, according to rules adopted by the Director of Consumer and Business Services.¶

(3) Individuals certified as a backflow assembly tester must comply with ORS 448.279(2).¶

(4) All backflow assembly tester training courses must be approved by the Authority and taken at an Authority approved training facility.¶

(5) Satisfactory completion of an approved backflow assembly tester training course means:¶

(a) Completing the course;¶

(b) Scoring at least 70 percent on the written examination; and¶

(c) Scoring at least 90 percent on the physical-performance examination.¶

(6) In order to apply for initial backflow assembly tester certification, individuals must submit:¶

(a) A completed initial application with all required documentation as specified on the initial application form and in this rule, including but not limited to:¶

(A) Proof of high school graduation, GED, associate's degree, bachelor's degree, master's degree, or PhD; and¶

(B) Proof of satisfactory completion, as described in section (5) of this rule, of a backflow assembly tester initial training course within the 12 months prior to the Authority receiving the completed application; and¶

(b) The initial certification fee as specified in section (9) of this rule.¶

(7) Backflow assembly tester certification expires on December 31 every two years based upon the first letter in the last name of the individual.¶

(a) Certification for individuals with names beginning in the letters A-K expire in even numbered years; and ~~¶~~

(b) Certification for individuals with names beginning in the letters L-Z expire in odd-numbered years.¶

(c) Certification renewal fees may be prorated if individuals are required to renew their certification prior to the end of the most recent two-year certification period.¶

~~(a)~~ Backflow assembly testers may only perform tests if they possess current, valid certification.¶

~~(b)~~ In order to apply to renew backflow assembly tester certification, individuals must submit:¶

(A) A completed renewal application with all required documentation as specified on the renewal application form and in this rule, including but not limited to:¶

(i) Proof of satisfactory completion, as described in section (5) of this rule, of either a backflow assembly tester renewal course or a backflow tester initial training course within the two-year period prior to the expiration date of the certification; and¶

(ii) Yearly test gauge accuracy verification or calibration reports must be performed in the same month every year, as determined by the backflow assembly tester a manner so that the tester is always using a calibrated gauge; and¶

(B) The certification renewal fee, as specified in section (9) of this rule.¶

~~(e)~~ The Authority may grant certification renewal without a reinstatement fee until January 31 in the year following the expiration date of the certification. A reinstatement fee as prescribed by section (9) of this rule is required in addition to the renewal fee for all renewal applications received after the grace period ending on January 31 following the expiration date of the certification.¶

~~(d)~~ Backflow assembly testers that fail to renew their certification for one year following the expiration date of their certification must meet the requirements established for applicants as prescribed by sections (6) or (8) of this rule as applicable.¶

(8) In order to apply for backflow assembly tester certification based on reciprocity, individuals must submit:¶

(a) A completed reciprocity application form with all required documentation as specified on the application form and in these rules, including but not limited to:¶

- (A) Proof of current certification from a state or entity having substantially equivalent certification training and testing standards to those set forth in these rules, as determined by the Authority;¶
- (B) Proof of satisfactory completion, as described in section (5) of this rule, of a backflow assembly tester initial training course or a backflow tester renewal course within the 12 months prior to the Authority receiving the completed application;¶
- (C) Proof of high school graduation, GED, associate's degree, bachelor's degree, master's degree, or PhD; and¶
- (D) Yearly test gauge accuracy verification or calibration reports must be performed in the same month every year, as determined by the backflow assembly tester a manner so that the tester is always using a calibrated gauge; and¶
- (b) The reciprocity review and initial certification fees as specified in section (9) of this rule.¶
- (9) Fees related to backflow assembly tester certification.¶
- (a) Payments ~~shall~~must be made to the Oregon Health Authority, Public Health Division.¶
- (b) The Authority will not refund any fees once it has initiated processing an application.¶
- (c) Fees are:¶
- (A) Initial Certification (2-years) \$195;¶
- (B) Certification Renewal (2-years) \$195;¶
- (C) Reciprocity Review \$35;¶
- (D) Reinstatement \$50; and¶
- (E) Combination Certification Renewal (2-years) \$305.¶
- (d) Initial certification fees may be prorated to the nearest year for the remainder of the 2-year certification period.¶
- (e) The Combination Certification Renewal fee applies when applicants simultaneously renew their backflow assembly tester and cross connection specialist certifications.¶
- (10) Enforcement related to Backflow Assembly Tester certification¶
- (a) The Authority may deny an initial application for certification, an application for renewal of certification, an application for certification based on reciprocity, or revoke a certification if the Authority determines the applicant/backflow assembly tester:¶
- (A) Provided false information to the Authority;¶
- (B) Did not possess certification issued by another state or entity because it was revoked;¶
- (C) Permitted another person to use their certificate number;¶
- (D) Failed to properly perform backflow prevention assembly testing;¶
- (E) Falsified a backflow assembly test report;¶
- (F) Failed to comply with ORS 448.279(2);¶
- (G) Failed to comply with these rules or other applicable federal, state or local laws or regulations; or¶
- (H) Performed backflow assembly tests with a gauge that was not calibrated for accuracy within the 12-month period prior to testing the assembly.¶
- (b) Applicants or backflow assembly testers who have been denied initial, renewal, or reciprocity certification or whose certifications have been revoked have the right to appeal according to the provisions of ORS chapter 183; ~~Oregon Revised Statutes.~~¶
- (c) Applicants or backflow assembly testers who have been denied initial, renewal, or reciprocity certification or whose certifications have been revoked, may not reapply for certification for one year from the date of denial or revocation of certification.¶
- (d) Applicants or backflow assembly testers may petition the Authority prior to one year from the date of denial or revocation and may be allowed to reapply at an earlier date, at the discretion of the Authority.¶
- (e) Backflow assembly tester test reports ~~shall~~must be made available to the Authority upon request.¶
- (11) When field testing a backflow prevention assembly, certified backflow assembly testers must use a field test kit that meets the criteria in Appendix A, Section A.7.1 of the Manual of Cross Connection Control, USC 10th Edition, published by the University of Southern California, October 2009 (USC Manual).
- Statutory/Other Authority: ORS 448.131, 448.279
- Statutes/Other Implemented: ORS 448.131, 448.278, 448.279



AMEND: 333-061-0073

RULE SUMMARY: Amend OAR 333-061-0073: The Cross Connection Specialist Certification rule was amended to improve the organization of rule text.

CHANGES TO RULE:

333-061-0073

### Cross Connection Specialist Certification ¶

- (1) In order to be certified as a cross connection specialist, individuals must successfully complete all the applicable requirements of this rule. Only individuals certified by the Authority may administer cross connection control programs.¶
- (2) Individuals certified as a cross connection specialist must comply with ORS 448.279(2).¶
- (3) All training courses must be taken at an Authority approved training facility or be an Oregon Environmental Services Advisory Council approved course.¶
- (4) Satisfactory completion of an approved cross connection specialist training course means:¶
  - (a) Completing the course; and¶
  - (b) Scoring at least 70 percent on the written examination.¶
- (5) In order to apply for initial cross connection specialist certification, individuals must submit:¶
  - (a) A completed initial application with all required documentation as specified on the initial application form and in this rule, including but not limited to:¶
    - (A) Proof of high school graduation, GED, associate's degree, bachelor's degree, master's degree, or PhD; and¶
    - (B) Proof of satisfactory completion, as described in section (4) of this rule, of a cross connection specialist initial training course within the 12 months prior to the Authority receiving the completed application;¶
    - (C) Proof of one-year of experience working with public water systems as defined in OAR 333-061-0020 or plumbing as defined in ORS 447.010; and¶
  - (b) The initial certification fee as specified in section (8) of this rule.¶
- (6) Cross connection specialist certification expires on December 31 every two years based upon the first letter in the last name of the individual.¶
  - (a) Certification for individuals with names beginning in the letters A-K expires in even numbered years; and¶
  - (b) Certification for individuals with names beginning in the letters L-Z expires in odd numbered years.¶
  - (c) Certification renewal fees may be prorated if individuals are required to renew their certification prior to the end of the most recent two-year certification period.¶
  - (d) In order to apply to renew cross connection specialist certification, individuals must submit:¶
    - (A) A completed renewal application with all required documentation as specified on the application form and in this rule, including but not limited to, proof of satisfactory completion of a total of at least 0.6 CEUs from cross connection-related training courses or meetings taken within the two-year period immediately prior to the date of the Authority receiving the completed application. Training courses and meetings must be attended at an Authority approved training facility or be approved by the Oregon Environmental Services Advisory Council; and¶
    - (B) The certification renewal fee, as specified in section (8) of this rule.¶
  - (e) The Authority may grant certification renewal without a reinstatement fee until January 31 in the year following the expiration date of the certification. A reinstatement fee as prescribed by section (8) of this rule is required in addition to the renewal fee for all renewal applications received after the grace period ending on January 31 following the expiration date of the certification.¶
  - (f) Cross connection specialists that fail to renew their certification for one year following the expiration date of their certification must meet the requirements established for applicants as prescribed by sections (5) or (7) of this rule.¶
- (7) In order to apply for cross connection specialist certification based on reciprocity, individuals must submit:¶
  - (a) A completed reciprocity application form with all required documentation as specified on the application form and in this rule, including but not limited to:¶
    - (A) Proof of current certification from a state or entity having substantially equivalent certification training and testing standards to those set forth in these rules, as determined by the Authority;¶
    - (B) Proof of satisfactory completion, as described in section (4) of this rule, of a cross connection specialist initial training course or cross connection specialist renewal course within the 12 months prior to the Authority receiving the completed application;¶
    - (C) Proof of high school graduation, GED, associate's degree, bachelor's degree, master's degree, or PhD; and¶
  - (b) The reciprocity application fee as specified in section (8) of this rule.¶
- (8) Fees related to Cross Connection Specialist certification.¶

- (a) Payments ~~shall~~must be made to the Oregon Health Authority, Public Health Division.-¶
- (b) The Authority will not refund any fees once it has initiated processing an application.-¶
- (c) Fees are:-¶
  - (A) Initial Certification (2-years) \$195;-¶
  - (B) Certification Renewal (2-years) \$195;-¶
  - (C) Reciprocity Review \$35;-¶
  - (D) Reinstatement \$50; and-¶
  - (E) Combination Certification Renewal (2-years) \$305.-¶
- (d) Initial certification fees may be prorated to the nearest year for the remainder of the 2-year certification period.-¶
- (e) The Combination Certification Renewal fee applies when applicants simultaneously renew their backflow assembly tester and cross connection specialist certifications.-¶
- (9) Enforcement related to cross connection specialist certification.-¶
  - (a) The Authority may deny an initial application for certification, an application for renewal of certification, an application for certification based on reciprocity, or revoke a certification if the Authority determines the applicant/cross connection specialist:-¶
    - (A) Provided false information to the Authority;-¶
    - (B) Did not possess certification issued by another state or entity because it was revoked;-¶
    - (C) Permitted another person to use their certificate number;-¶
    - (D) Falsified a survey/inspection/Annual Summary Report;-¶
    - (E) Failed to comply with ORS 448.279(2); or-¶
    - (F) Failed to comply with these rules or other applicable federal, state or local laws or regulations.-¶
  - (b) Applicants or cross connection specialists who have been denied initial, renewal, or reciprocity certification or who have had their certification revoked have the right to appeal according to the provisions of ORS chapter 183; ~~Oregon Revised Statutes~~;-¶
  - (c) Applicants or cross connection specialists who have been denied initial, renewal, or reciprocity certification or who have had their certification revoked may not reapply for certification for one year from the date of denial or revocation of certification.-¶
  - (d) Applicants or cross connection specialists may petition the Authority prior to one year from the date of denial or revocation and may be allowed to reapply at an earlier date, at the discretion of the Authority.  
Statutory/Other Authority: ORS 448.131, 448.279  
Statutes/Other Implemented: ORS 448.131, 448.278, 448.279

AMEND: 333-061-0074

RULE SUMMARY: Amend OAR 333-061-0074: The Cross Connection Training Programs, Course, and Instructor Requirements rule was amended to improve rule text according to recommendations from the Oregon Cross Connection Advisory Board.

CHANGES TO RULE:

333-061-0074

Cross Connection Training Programs, Course, and Instructor Requirements ¶¶

(1) ~~In order to~~ To qualify as an Authority approved ~~Cross Connection Specialist~~ training program or facility or ~~Backflow Assembly Tester~~ training program or facility, the following requirements must be met:¶¶

(a) An application for approval must be submitted to and approved by the Authority prior to offering training within Oregon.¶¶

(b) The training program must keep permanent records on attendance and performance of each student that enrolls in a course;¶¶

(~~b~~c) The training program must submit the names of students who have successfully completed the training course to the Authority upon completion of the training course;¶¶

(~~e~~d) The training schedule must be set in advance and the schedule must be submitted to the Authority quarterly for review and publication;¶¶

(~~d~~e) The backflow training program must maintain a proper ratio of student-to-training equipment. A maximum ratio of three students for each backflow assembly test station is allowed for the ~~B~~backflow ~~A~~assembly ~~T~~tester training course;¶¶

(~~e~~f) The training program must provide uniform training at all course locations;¶¶

(~~f~~g) The training program ~~shall~~must provide the training materials necessary to complete the course. ~~Prior to making significant changes to the training materials must be,~~ the updated ~~annually and~~ training materials must be submitted to the Authority for approval; ~~and~~¶¶

(~~g~~) ~~Training using unapproved materials does not qualify as Authority-approved training; and~~¶¶

(h) The training program must provide a demonstration of its training materials to the Authority upon request.¶¶

(i) The training program must have the following minimum training equipment available for each course:¶¶

(A) Each test station for ~~B~~backflow ~~A~~assembly ~~T~~tester initial training and certification renewal courses ~~shall~~must include:¶¶

(i) An operating PVB, SVB, double check valve backflow prevention assembly, and a RP, with appropriate test gauges for each assembly; ~~and~~¶¶

(ii) A backflow prevention assembly failure simulator ~~shall~~must also be provided that is capable of simulating leaking check valves, shutoff valves, and relief valve failures.¶¶

(B) The training aids for the ~~B~~backflow ~~A~~assembly ~~T~~tester training program or facility and ~~C~~ross ~~C~~onnection ~~S~~pecialist training program or facility ~~shall~~must include the atmospheric vacuum breaker, PVB, SVB, double check valve backflow prevention assembly, RP, and a variety of test gauges.¶¶

(~~h~~i) The training program must maintain uniform course curriculum according to sections (2), (3), (4) and (5) of this rule ~~section~~, and maintain uniform instructor requirements according to section (6) of this rule ~~section~~, subject to approval by the Authority.¶¶

(2) Requirements for the ~~C~~ross ~~C~~onnection ~~S~~pecialist initial training course ~~shall~~must include:¶¶

(a) A minimum of 30 hours of training;¶¶

(b) The course content ~~shall~~must contain, but is not limited to, the following topics:¶¶

(A) ~~D~~Backflow and cross connection definitions; ~~i~~;¶¶

(B) Identification of cross connection hazards; ~~and~~ ~~t~~;¶¶

(C) The hydraulics of backflow;¶¶

(~~B~~D) Review of cross connection control regulations included in OAR 333-061-0070 through 333-061-0073;¶¶

(E) Approved cross connection control methods; ~~b~~;¶¶

(F) Backflow prevention assembly specifications, and testing methods used for Authority-approved backflow prevention assemblies;¶¶

(~~C~~G) Cross connection control requirements for public water systems; ~~i~~;¶¶

(H) Implementation of a cross connection control program; and ~~was prescribed by section (10) of this rule;~~¶¶

(I) Writing a local cross connection control ordinance or enabling authority;¶¶

(~~D~~J) Public education and ~~r~~program;¶¶

(K) Record keeping requirements for an effective cross connection control program;¶¶

(~~E~~L) Required written procedures;¶¶

- (M) Facility water use inspection techniques and h;¶
- (N) Hands on inspection of local facilities to identify actual or potential cross connections;¶
- (FO) Cross connection control program enforcement and m;¶
- (P) Managing a Backflow Assembly Tester program; and¶
- (GQ) Review and discussion of Ccross Cconnection Sspecialist safety issues.¶
- (c) A minimum score of 70 percent is required to pass the Authority approved Ccross Cconnection Sspecialist written examination.¶
- (3) Requirements for the Bbackflow Aassembly Ttester initial training course shallmust include:¶
- (a) A minimum of 40 hours of training;¶
- (b) The course content shallmust contain, but is not limited to, the following topics:¶
- (A) ~~D~~Backflow and cross connection definitions; i;¶
- (B) Identification of cross connections; and t;¶
- (C) The hydraulics of backflow;¶
- (BD) Review of cross connection control regulations included in OAR 333-061-0070 through 333-061-0073;¶
- (E) Hazards associated with backflow pollution and contamination of potable water; a;¶
- (F) Approved cross connection control methods; and e;¶
- (G) Cross connection control program requirements for public water systems;¶
- (CH) Backflow prevention assembly approval requirements; s;¶
- (I) Specifications and installation requirements for approved backflow prevention assemblies; and b;¶
- (J) Backflow prevention assembly repair techniques;¶
- (DK) Complete disassembly and reassembly of each type of backflow prevention assembly;¶
- (EL) ~~Hands-on demonstration of the correct test procedures, troubleshooting for each type~~ Test gauge calibration and gauge accuracy verification methods;¶
- (M) Review and discussion of backflow prevention assembly, and diagnosis of two failure or abnormal conditions during the hands-on backflow assembly test of assembly tester safety issues; and¶
- (N) A physical performance examination with a hands-on demonstration of the correct test procedures for each type of backflow prevention assembly;¶
- (F) Test gauge calibration and gauge accuracy verification methods; and¶
- (G) Review and discussion of Backflow Assembly Tester safety issue, troubleshooting for each type of backflow prevention assembly; and diagnosis of two failure or abnormal conditions.¶
- (c) A minimum score of 70 percent is required to pass the Authority-approved Bbackflow Aassembly Ttester written examination; and¶
- (d) A minimum score of 90 percent is required to pass the Authority-approved Bbackflow Aassembly Ttester physical performance examination.¶
- (4) Requirements for Ccross Cconnection Sspecialist certification renewal shallmust include:¶
- (a) A minimum of 0.6 CEUs of training;¶
- (b) The course content shallmust contain, but is not limited to, the following topics:¶
- (A) Review of cross connection control regulations OAR 333-061-0070 through 0073;¶
- (B) Review and discussion of recent backflow incidents and identification of cross connections; and¶
- (C) Review and discussion of Ccross Cconnection Sspecialist safety issues.¶
- (5) Requirements for Bbackflow Aassembly Ttester certification renewal shallmust include:¶
- (a) A minimum of 0.5 CEUs of training, excluding examination time;¶
- (b) The course content shallmust contain, but is not limited to, the following topics:¶
- (A) Review of cross connection control regulations included in OAR 333-061-0070 through 0073;¶
- (B) Review of approved test procedures for backflow prevention assemblies;¶
- (C) Hands-on demonstration of the correct test procedures for each type of backflow prevention assembly;¶
- (D) The correct student diagnosis and explanation of two failure or abnormal conditions during the hands-on backflow prevention assembly test of each type of backflow prevention assembly;¶
- (E) Review and discussion of Bbackflow Aassembly Ttester safety issues; and¶
- (F) Written examination that includes questions on cross connection control regulations OAR 333-061-0070 through 0073; and¶
- (G) A physical performance examination that includes testing the different types of backflow assemblies.¶
- (c) A minimum score of 70 percent is required to pass the Authority approved Bbackflow Aassembly Ttester written examination; and¶
- (d) A minimum score of 90 percent is required to pass the Authority approved Bbackflow Aassembly Ttester physical performance examination.¶
- (6) Instructor qualification requirements shall include: To qualify as an Authority approved instructor, an application for approval must be submitted to and approved by the Authority prior to offering training.¶
- (a) The instructor must provide a demonstration of their training materials to the Authority upon request.¶

~~(a)~~ To be eligible as an instructor for ~~C~~ross ~~C~~onnection ~~S~~pecialist initial training or certification renewal course, ~~the following experience in the~~ individuals must meet the following requirements in the field of cross connection control field is required:¶

~~(A) Must be currently certified as a C~~ross ~~C~~onnection ~~S~~pecialist in Oregon;¶

~~(B) Must have 2~~two years of experience in enforcement of cross connection control requirements, or as a certified ~~C~~ross ~~C~~onnection ~~S~~pecialist, or have related experience, subject to approval by the Authority;¶

~~(C) Must participate in two complete Cross-Connection Specialist training courses as a student instructor assigned to teach a portion of the curriculum. A student instructor training program schedule must be submitted to the Authority for approval before training begins;¶~~

~~(D) Must receive a recommendation from the instructor of record for approval as an instructor. An unfavorable recommendation must be documented by supporting information and may be challenged by the trainee or by the Authority; and¶~~

~~(E) Must attend at least one instructor update meeting provided by the Authority each year.¶~~

~~(b)~~ To be eligible as an instructor for the ~~B~~ackflow ~~A~~ssembly ~~T~~ester initial training or certification renewal course, ~~the following experience in the~~ backflow prevention field is required:¶

~~(A) Must be~~ individuals must meet the following requirements in the field of backflow prevention:¶

~~(A) Currently certified as a B~~ackflow ~~A~~ssembly ~~T~~ester in Oregon; and¶

~~(B) Must have 2~~Two years of experience as a certified ~~B~~ackflow ~~A~~ssembly ~~T~~ester and experience installing, testing backflow prevention assemblies, or as a vocational instructor, or have related experience, subject to approval by the Authority;¶

~~(C) Must participate in two complete Backflow Assembly Tester training courses as a student instructor assigned to teach a portion of the text curriculum and the physical performance portion of the curriculum. A student instructor training program schedule must be submitted to the Authority for approval before training begins;¶~~

~~(D) Must receive a recommendation from the instructor of record for approval as an instructor. An unfavorable recommendation must be documented by supporting information and may be challenged by the trainee or by the Authority; and¶~~

~~(E) Must attend at least one instructor update meeting provided by the Authority each year.¶~~

~~(c) The Authority shall m~~Approved instructors must attend at least one instructor update meeting provided by the Authority each year.¶

~~(e) The instructor must permit the Authority to audit any approved traintain a list of qualified instructorsing course without charge.~~

Statutory/Other Authority: ORS 448.131

Statutes/Other Implemented: ORS 448.131, 448.150, 448.273, 448.278, 448.279

AMEND: 333-061-0087

RULE SUMMARY: Amend OAR 333-061-0087: The Product Acceptability Criteria rule was amended to improve rule text and clarify NSF applicability.

CHANGES TO RULE:

333-061-0087

Product Acceptability Criteria ¶¶

(1) Any pipe, solder, or flux used in the installation or repair of a public water system or any plumbing in a residential or nonresidential facility providing water for human consumption must be lead free as defined in OAR 333-061-0020 except for leaded joints necessary for the repair of cast iron pipes.¶¶

(2) No solder containing more than 0.20 percent lead shall be sold in Oregon unless the solder contains a warning label, prominently displayed, which states, "Contains Lead. Oregon Law prohibits the use of this solder in making up joints and fittings in any private or public potable water supply system or any individual water user's line". Solder to be used in making up joints and fittings in any private or public potable water supply system or any individual water user's line shall meet ASTM Specification B32-76.¶¶

(3) Plumbing piping shall not be used for electrical grounding in any new construction.¶¶

(4) No lead pipe, lead goosenecks or similar appurtenances shall be used in the construction of any public water system and every water supplier must certify to the Authority that lead pipe, goosenecks or similar appurtenances do not exist within its water system. A water supplier that identifies the existence of lead components within its water system must submit a compliance schedule, acceptable to the Authority, for the removal of all lead components as described in this section.¶¶

(5) Materials and products which come into contact with drinking water supplied by public water systems or which come into contact with drinking water treatment chemicals used ~~by~~ at public water systems ~~shall meet the requirements of~~ must be certified to NSF Standard 61: Drinking Water System Components - Health Effects; ~~NSF/ANSI Standard 372~~ or equivalent. These materials and products include but are not limited to process media, protective materials, joining and sealing materials, pipes and related products, and mechanical devices used in treatment, transmission, and distribution systems.¶¶

(6) Products added to public water systems for treatment, purposes including but not limited to disinfection, oxidation, filtration, scale control, corrosion control, pH adjustment, softening, precipitation, sequestering, fluoridation, coagulation, flocculation, and water well treatment shall meet the requirements of NSF Standard 60: Drinking Water Treatment Chemicals - Health Effects or equivalent.¶¶

(7) Point-of-use reverse osmosis drinking water treatment systems, materials or components used in these systems designed to be used for the reduction of specific contaminants from public water supplies shall meet the requirements of NSF Standard 58: Reverse Osmosis Drinking Water Treatment Systems or equivalent.¶¶

(8) Point-of-use and point-of-entry drinking water treatment units, other than reverse osmosis units, designed to be used for the reduction of specific contaminants from public water supplies shall meet the requirements of NSF Standard 53: Drinking Water Treatment Units - Health Effects or equivalent.

Statutory/Other Authority: ORS 448.131

Statutes/Other Implemented: ORS 448.131

AMEND: 333-061-0098

RULE SUMMARY: Amend OAR 333-061-0098: The References rule was amended to include a document cited within OAR 333-061-0060 and OAR 333-061-0072.

CHANGES TO RULE:

333-061-0098

References ¶¶

All standards, listings and publications referred to in these rules are by those references made a part of these rules as though fully set forth. Copies are available from Oregon Health Authority, Public Health Division.¶¶

- (1) American Society for testing and materials (ASTM) specification B32-83 (solder).¶¶
- (2) American Water Works Association (AWWA) Standards.¶¶
- (3) Clean Water Act (EPA).¶¶
- (4) Code of Federal Regulations (40 CFR: ~~141.21-.25, 141.30 - Inorganics, etc.~~).¶¶
- (5) Code of Federal Regulations (21 CFR: 103, 110 and 129 - Bottled water).¶¶
- (6) Federal Insecticide, Fungicide and Rodenticide ACT (FIFRA-EPA).¶¶
- (7) Manual of Cross Connection Control, USC 10th Edition, October 2009.¶¶
- (8) National Bureau of Standards (NBS) Handbook 69, - Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and Water for Occupational Exposure.¶¶
- (9) National Primary Drinking Water Regulations (40 CFR 141 and 142).¶¶
- (10) NSF Standard 53 - Drinking Water Treatment Units - Health Effects.¶¶
- (11) NSF Standard 58 - Reverse Osmosis Drinking Water Treatment Systems.¶¶
- (12) NSF Standard 60 - Drinking Water Treatment Chemicals - Health Effects.¶¶
- (13) NSF Standard 61, Section 9 - Drinking Water System Components - Health Effects.¶¶
- (14) National Secondary Drinking Water Regulations (40 CFR 143).¶¶
- (15) Oregon Administrative Rules chapter 437 (Oregon OSHA).¶¶
- (16) Oregon Administrative Rules chapter 660, division 011 (Public Facilities Planning).¶¶
- (17) Oregon Administrative Rules chapter 660, division 031 (Land Conservation & Development).¶¶
- (18) Oregon Administrative Rules chapter 690, divisions 200 through 220 (General standards for the construction and maintenance of water wells in Oregon, Water Resources Department).¶¶
- (19) Oregon Revised Statutes chapter 197 (Land Conservation & Development).¶¶
- (20) Oregon Revised Statutes chapters 215 and 227 (Land Use Planning).¶¶
- (21) Oregon Revised Statutes chapter 448 (Public Water Systems).¶¶
- (22) Oregon Revised Statutes 468.700 to 468.990 (DEQ).¶¶
- (23) Oregon Revised Statutes 527.610 to 527.990 (Dept. of Forestry).¶¶
- (24) Oregon Revised Statutes 536.220 to 536.360 (Water Resources).¶¶
- (25) Oregon Revised Statutes 634.992 (Dept. of Agriculture).¶¶
- (26) Oregon State Plumbing Code.¶¶
- (27) Standard Methods for the Examination of Water and Wastewater, 22nd Edition, 2012.¶¶
- (28) Supplement to the 19th Edition of Standard Methods for the Examination of Water and Wastewater, 1996.¶¶
- (29) Map of Earthquake and Tsunami Damage Potential for a Simulated Magnitude 9 Cascadia Earthquake, Open File Report 0-13-06, Plate 7.¶¶
- (30) Manual of Cross Connection Control, USC 10th Edition, published by the University of Southern California, October 2009.¶¶

[Publications: Publications referenced are available from the agency.]

Statutory/Other Authority: ORS 448.131

Statutes/Other Implemented: ORS 431.110, 431.150, 448.131, 448.150, 448.273, 448.279

AMEND: 333-061-0220

RULE SUMMARY: Amend OAR 333-061-0220: The Classification of Water Treatment Plants and Water Distribution Systems rule was amended to clarify water treatment plant rating when on-site generated chlorine is used.

CHANGES TO RULE:

333-061-0220

### Classification of Water Treatment Plants and Water Distribution Systems ¶

Water treatment plants and distribution systems at community and non-transient non-community public water systems are classified based on the size and complexity of the water system facility. Classification of a water system or water system facility determines the level of certification required for operators in direct responsible charge of a water system or water system facility as prescribed by OAR 333-061-0225.¶

(1) Small water system classification applies when a water system serves fewer than 1501 service connections or ~~less and:~~¶

(a) Uses only groundwater as its source; or¶

(b) Purchases finished water from another public water system.¶

(2) Water distribution classification applies when a water system is not classified as small in accordance with section (1) of this rule, and is based on the population served by the water system as follows:¶

Classification: - Population Served:¶

Water Distribution 1 - 1 to 1,500.¶

Water Distribution 2 - 1,501 to 15,000.¶

Water Distribution 3 - 15,001 to 50,000.¶

Water Distribution 4 - 50,001 or more¶

(3) Water treatment classification applies to water treatment plants when:¶

(a) A water system is not classified as small in accordance with section (1) of this rule; and¶

(b) Treatment is provided for contaminants identified in OAR 333-061-0030(1) through (5) and (7) by that water treatment plant.¶

(c) Water treatment classification is based on a point system that reflects the complexity of water treatment present. Points are assigned as follows:¶

Item - Points.¶

Treatment system size: (population served or flow whichever is greater):¶

Population served - 1/10,000 (max 30):¶

Average daily flow - 1/1 mgd (max 30):¶

Treatment system water source:¶

Groundwater: - 3.¶

Surface ~~W~~water or ~~G~~groundwater ~~U~~nder the ~~I~~nfluence of ~~S~~urface ~~W~~water - 5.¶

Chemical ~~T~~treatment/~~A~~ddition ~~P~~rocess:¶

Fluoridation - 5.¶

Disinfection:¶

Ultraviolet ~~l~~ight (UV) - 2.¶

UV with ~~C~~hlorine ~~R~~esidual - 5.¶

Ammonia/~~C~~hloramination - 3.¶

Chlorine - 5.¶

~~M~~On-site generated chlorine or mixed ~~O~~xidants - 7.¶

Ozonation (on-site generation) - 10.¶

~~R~~Disinfectant residual ~~M~~aintenance - 0.¶

pH adjustment:¶

Slaked-~~Q~~uicklime (~~C~~alcium ~~O~~xide) - 5.¶

Hydrated ~~L~~ime (~~C~~alcium ~~H~~ydroxide) - 4.¶

All others - 1.¶

(hydrochloric acid, sodium hydroxide, sulfuric acid, sodium carbonate).¶

Coagulation & ~~F~~locculation processes:¶

Chemical addition - 1-5.¶

(1 point for each type of chemical coagulant or polymer added, maximum 5 points).¶

Rapid mix units:¶

Mechanical mixers - 3.¶

Injection mixers - 2.¶

In-line blender mixers - 2.¶



Flocculation units:¶

Hydraulic flocculators - 2.¶

Mechanical flocculators - 3.¶

Clarification and Sedimentation Processes:¶

Adsorption Clarifier - 10.¶

Horizontal-flow (rectangular basins) - 5.¶

Horizontal-flow (round basins) - 7.¶

Up-flow solid contact sedimentation - 15.¶

Inclined-plate sedimentation - 10.¶

Tube sedimentation - 10.¶

Dissolved air flotation - 10.¶

Filtration Processes:¶

Single/mono media filtration - 3.¶

Dual or mixed media filtration - 5.¶

Membrane Filtration/Microscreens - 5.¶

Direct - 5.¶

Diatomaceous earth - 12.¶

Slow sand filtration - 5.¶

Cartridge/bag filters - 5.¶

Pressure or greensand filtration - 10.¶

Stability or Corrosion Control:¶

Slaked-Quicklime (calcium oxide) - 10.¶

Hydrated Lime (calcium hydroxide) - 8.¶

Caustic soda (sodium hydroxide) - 6.¶

Orthophosphate - 5.¶

Soda ash (sodium carbonate) - 4.¶

Aeration: Packed tower, Diffusers - 3.¶

Calcite - 2.¶

Others: sodium bicarbonate, silicates - 4.¶

Other Treatment Processes:¶

Aeration - 3.¶

Packed tower aeration - 5.¶

Ion exchange/softening - 5.¶

Lime-soda ash softening - 20.¶

Copper sulfate treatment - 5.¶

Powdered activated carbon - 5.¶

Potassium permanganate - 5.¶

Special Processes (reverse osmosis, activated alumina, other) - 15.¶

Sequestering (polyphosphates) - 3.¶

Residuals Disposal:¶

Discharge to lagoons - 5.¶

Discharge to lagoons and then raw water source - 8.¶

Discharge to raw water - 10.¶

Disposal to sanitary sewer - 3.¶

Mechanical dewatering - 5.¶

On-site disposal - 5.¶

Land application - 5.¶

Solids composting - 5.¶

Facility characteristics Instrumentation:¶

The use of SCADA or similar instrumentation systems to provide data with no process control - 1.¶

The use of SCADA or similar instrumentation systems to provide data with partial process control - 3.¶

The use of SCADA or similar instrumentation systems to provide data with complete process control - 5.¶

Clear well size less than average day design flow - 5.¶

Classification of Water Treatment Plants:¶

Classification - Points:¶

Water Treatment 1 - 1 to 30.¶

Water Treatment 2 - 31 to 55.¶

Water Treatment 3 - 56 to 75.¶

Water Treatment 4 - 76 or more.¶

(4) Filtration endorsement is an additional classification that applies when a water treatment plant is classified as Water Treatment 2 and uses conventional or direct filtration treatment to treat surface water or groundwater under the influence of surface water. Filtration endorsement certification, as prescribed by OAR 333-061-0235, is required for operators designated in direct responsible charge of a water treatment plant receiving the filtration endorsement classification, except for those operators already certified at Water Treatment Level 3 or higher.

Statutory/Other Authority: ORS 448.131

Statutes/Other Implemented: ORS 448.450, 448.455, ~~448.460~~, ~~448.465~~, 448.994

AMEND: 333-061-0540

RULE SUMMARY: Amend OAR 333-061-0540: The Cyanotoxin Monitoring rule was amended to identify microcystins levels triggering additional monitoring.

CHANGES TO RULE:

333-061-0540

#### Cyanotoxin Monitoring

(1) Water suppliers with raw water intakes into susceptible sources must monitor as follows:¶

(a) At raw water sampling points:¶

(A) From May 1 through October 31, water suppliers must monitor at the raw water sampling point at least once every two weeks for cyanotoxins. Samples from upstream locations collected for recreational or other purposes may be substituted for raw water sampling if approved by the Authority based on proximity and characteristics of sampling locations, sampling techniques and analytical methods used, and intake construction.¶

(B) If at any time ~~either total microcystins or cylindrospermopsin concentration in raw water are~~ are detected at greater than or equal to 0.20 µg/L or cylindrospermopsin is detected at greater than or equal to 0.30 µg/L in raw water, or there is a recreational use health advisory in a water body upstream, water suppliers must immediately increase raw water monitoring of cyanotoxins to weekly.¶

(C) Water suppliers may resume raw water monitoring every two weeks if there is not a recreational use health advisory upstream and ~~cyanotoxin levels are~~ total microcystins are not detected or are detected at less than 0.20 µg/L and cylindrospermopsin is not detected or is detected at less than 0.30 µg/L in at least two consecutive weekly samples.¶

(b) At entry points:¶

(A) If ~~a cyanotoxin concentration is~~ total microcystins are detected at greater than or equal to 0.20 µg/L or cylindrospermopsin is detected at greater than or equal to 0.30 µg/L at the raw water sampling point, water suppliers must monitor for cyanotoxins at the entry point weekly, beginning within one business day of receiving raw water results.¶

(B) If cyanotoxins are detected at any entry point sample, water suppliers must immediately take steps to optimize existing facilities or treatment processes to reduce cyanotoxins and begin monitoring at the entry point daily beginning within 24 hours of notification of results.¶

(C) Water suppliers may resume weekly entry point monitoring if cyanotoxins are not detected in two consecutive daily samples collected at the entry point.¶

(D) Water suppliers may cease entry point monitoring if the results from two consecutive samples of the raw water are less than 0.3 µg/L and is not detected in two consecutive entry point or distribution samples.¶

(2) Monitoring following a cyanotoxin health advisory level exceedance at entry point.¶

(a) If the cyanotoxin concentration exceeds a health advisory level in a sample collected at the entry point, the water supplier must collect a confirmation sample from the entry point as soon as practical, but no later than 24 hours after receiving results.¶

(b) At water systems where a health advisory is in effect, water suppliers must sample in the distribution system according to OAR 333-061-0570(4) in order for the health advisory to be lifted. Additional distribution system monitoring may be required by the Authority based on sampling results and other relevant circumstances. Distribution monitoring may cease when the advisory is lifted.¶

(c) Once the health advisory is lifted as permitted under OAR 333-061-0570(4), water suppliers must monitor no less frequently than prescribed in section (2) of this rule.¶

(3) The Authority may extend the monitoring timeline required pursuant to this rule on a case-by-case basis upon a request from a water supplier, when the water supplier has a logistical problem timely collecting or analyzing samples in accordance with the requirements of OAR 333-061-0510 to 333-061-0580. When an extension is approved by the Authority, the Authority must specify in writing how much time the water supplier has to monitor. Examples of logistical problems could include, but are not limited to:¶

(a) Extreme weather conditions that create unsafe travel or on-site conditions for the person collecting the sample.¶

(b) Limited laboratory capacity on weekends and holidays.

Statutory/Other Authority: ORS 448.123, 448.131, 448.150

Statutes/Other Implemented: ORS 448.123, 448.150

AMEND: 333-061-0550

RULE SUMMARY: Amend OAR 333-061-0550: The Analytical Methods rule was amended to identify additional laboratory methods acceptable for cyanotoxin sample analysis.

CHANGES TO RULE:

333-061-0550

Analytical Methods

(1) ~~A w~~Water suppliers must use a laboratory accredited according to OAR chapter 333, division 64 and the Oregon Environmental Laboratory Accreditation Program (ORELAP), or the Oregon Department of Environmental Quality Laboratory to analyze samples required by OAR 333-061-0510 to 333-061-0580.¶

(2) For total microcystins, ~~a water suppliers~~ must ensure that samples are analyzed using EPA method 546, or another EPA-approved method that applies at the time samples are analyzed. Eurofins Abraxis SAES ELISA kits (520011SAES) are equivalent to ELISA kits (520011OH) as described in section 6.1 of EPA Method 546.¶

(3) For cylindrospermopsin, ~~a water suppliers~~ must ensure that samples are analyzed using the DEQ Analytical Method for Determination of Cylindrospermopsin in Raw and Finished Water by ELISA Method, or another EPA-approved method that applies at the time samples are analyzed. If detections are found greater than 0.7 µg/L at the entry point or distribution system, all samples taken in response to this detection must be analyzed using EPA Method 545, or another EPA-approved method that applies at the time samples are analyzed.¶

(4) ~~The w~~Water suppliers must ensure that laboratories and subcontracted laboratories start analysis of samples within one business day of receipt.

Statutory/Other Authority: ORS 448.123, 448.131, 448.150

Statutes/Other Implemented: ORS 448.123, 448.150

AMEND: 333-061-0560

RULE SUMMARY: Amend OAR 333-061-0560: The Reporting rule was amended to identify a level for microcystins reporting and clarify rule text.

CHANGES TO RULE:

333-061-0560

#### Reporting

(1) If the cyanotoxin concentration exceeds a health advisory level in an initial sample collected at any entry point or distribution system location in accordance with OAR 333-061-0540, the water supplier must report the result to the Authority and all purchasing systems served by the water supplier as soon as possible but no later than 24 hours after receiving the results.¶

(2) If the cyanotoxin concentration exceeds a health advisory level in a confirmation sample collected at the entry point in accordance with OAR 333-061-0540(2), the water supplier must report the result to the Authority and all purchasing systems served by the water supplier as soon as possible but no later than eight hours after receiving the results.¶

(3) ~~The w~~Water suppliers must ensure that laboratories follow the reporting requirements as follows:¶

(a) Laboratories using EPA method 546 or the DEQ Method for Determination of Cyanotoxins in Raw and Finished Water by ELISA Method must validate results and report any analysis that exceeds a health advisory level directly to the Authority and to the water supplier as soon as possible but no later than two business days after analysis begins. Laboratories using EPA method 545 must validate results and report any analysis that exceeds a health advisory level directly to the Authority and to the water supplier as soon as possible but no later than three business days after analysis begins. Laboratories must report any analysis received from a subcontracted laboratory directly to the Authority and the water supplier within one business day after receiving the validated results;¶

(b) Subcontracted laboratories using EPA method 546 or the DEQ Method for Determination of Cyanotoxins in Raw and Finished Water by ELISA Method must validate results and report any analysis that exceeds a health advisory level directly to the contracting laboratory as soon as possible but no later than two business days after analysis begins. Subcontracted laboratories using EPA method 545 must validate results and report any analysis that exceeds a health advisory level directly to the contracting laboratory as soon as possible but no later than three business days after analysis begins;¶

(c) ~~Laboratories must report~~For any analytical result used to determine whether an advisory may be lifted pursuant to OAR 333-061-0570(4) ~~to~~, laboratories must report results to both the Authority and to the water supplier within one business day of sample validation by the laboratory;¶

(d) ~~Laboratories must~~For any entry point sample result collected in ~~response any analytical result~~nse to a raw water sample result with a detection greater than or equal to ~~0.3 µg/L for cyanotoxins to~~20 µg/L for total microcystins or ~~0.30 µg/L for cylindrospermopsin~~, laboratories must report results to both the Authority and the water supplier within one business day of sample validation;¶

~~(e) Laboratories must report all other analytical results by the laboratory;~~¶

(e) For any analytical result with a detection greater than or equal to 0.20 µg/L for total microcystins or 0.30 µg/L for cylindrospermopsin, laboratories must report results to the Authority and the water supplier within one business day of sample validation by the laboratory;¶

(f) For all other analytical results with no detection or with total microcystins detected at less than 0.20 µg/L or cylindrospermopsin detected at less than 0.30 µg/L, laboratories must report results to the Authority within 10 days of the end of the month in which the sample was collected; and¶

(fg) Analyses required by OAR 333-061-0540 must be uploaded by the laboratory to the Authority in an approved XML format or submitted in a format approved by the Authority.¶

(4) Every sample collected from a raw water sample point, entry point or from the distribution system and analyzed for cyanotoxins by an ORELAP accredited laboratory or the Oregon Department of Environmental Quality using an analysis method identified in OAR 333-061-0550 must be reported to the Authority according to this rule.

Statutory/Other Authority: ORS 448.123, 448.131, 448.150

Statutes/Other Implemented: ORS 448.123, 448.150