

**Plumbing Board
Meeting Minutes
October 21, 2014 at 9:30 a.m.
Minnesota Room – Department of Labor and Industry
443 Lafayette Road North, St. Paul, MN 55155**

Members

John Parizek (Chair)
Scott Eggen
Jim Kittelson
Larry Justin
John Flagg
Pete Moulton
Ron Thompson
Joe Beckel
Phillip Sterner (Secretary)
Jim Lungstrom

Members Absent

Gale Mount
Grant Edwards
Mike McGowan
Jeff Brown

DLI Staff & Visitors

Wendy Legge (Chief Gen. Counsel, DLI)
Suzanne Todnem (DLI)
Cathy Tran (DLI)
Jim Peterson (DLI)
Lyndy Lutz (DLI)
Brad Jensen (DLI)
Gary Thaden (MMCA)
Matt Marciniak (IAPMO)
Richard Hauffe (ICC)
Gary Ford (Metro Testing)
Brian Noma (MDH)
Tim Power (MNLA)
Luke Westman (PHCC)
Jessica Bartram (PHCC)
Mark Johnson (PHCC)
Carl Crimmins (PHCC)
Craig Johnson (ASPE)
John Schroeder (Schroeder Sales Co.)
Tom McCarthy (Local 34)
Scott Thompson (MN Plumbing Training)
Phil Raines (ABC)
Dwight Engen (MN LECET)
Bob Taylor (Osland Piping)
Brian Soderholm (Soderholm/WCC)

I. Call to Order

The meeting was called to order by Chair Parizek at 9:37 a.m. Introductions and housekeeping announcements were made. Attendance was taken; a quorum was met with 9 of 13 members present.

II. Approval of Meeting agenda

A motion was made by Justin, seconded by Moulton, to approve the agenda with an addition to VI. Special Business, Item C) Procedures for Variance. The vote was unanimous; the motion carried.

III. Approval of Previous Meeting Minutes

A. Plumbing Board Minutes – July 15, 2014

A motion was made by Sterner, seconded by Justin, to approve the Minutes as presented. The vote was unanimous; the motion carried.

IV. Regular Business

Approval of Expense Reports – Parizek approved the expenses as presented.

V. Committee Reports

A) Department Updates

The Board's new member, Jeff Brown, was appointed to Chad Filek's vacated seat (Commercial / Industrial Plumbing Journeyman from outside the Twin Cities). He is from Duluth and due to the late notice won't be joining us today.

- i. Current rulemaking for department – Todnem provided an update. The first wave of updated rules for the Construction Codes and Licensing Division will have an effective date of Jan. 24, 2015. This includes chapters: Administrative, Accessibility, Elevator, Residential, Residential Energy, and the Conservation Code for Existing Buildings. The second wave of rules will be effective February 14, 2015 which includes Mechanical and Fuel Gas. Legge noted that the Notice of Intent to Adopt Chapter 1305 has not been published and there has not been an amendment to the Fire Code.

B) Executive Committee

Met this morning and reviewed today's agenda items.

C) Construction Codes Advisory Council

Nothing to report

VI. Special Business

A) Review of modifications to Revisor's draft of proposed Minnesota Rules chapter 4714

(See Attachment A) Minor additions / clarifications need to be approved by a 2/3 majority (9 of 13 members).

The Board reviewed all suggested changes and approved edits will be reflected on the next Rule Draft copy.

Suggested changes / clarifications to the rule:

Line 1.8, change to "2003"

Line 4.12, change statute chapter to "326B"

Page 6, amendment noted to move definition of "Approved" to subpart 2

6.16 and 6.17, suggested adding the word and definition to barometric loop. Definition on page 21 moves to page 6; then a rule part 4714.0204 would need to be added to include this term.

Page 10, changes noted

Page 14, typographical error, include title

Page 17, line 17.7, UPC sections 506.0 to 506.9, including all figures, are deleted in their entirety.

Page 19, language clarified

Page 21, line 21.9, “or” was removed and replaced with “and not.” Line 21.22 – add the language “a minimum of” to read “inverted “u” located upstream and rising **a minimum of** 35 feet above the highest fixture it supplies.” The entire section would be included in definitions.

Page 24, footnote was added in error and is therefore removed.

Page 25, will ask the Revisor to indent items 25.12 to 25.20

Page 27, line 27.4, 27.15, 27.18, and 27.20 hand-written edits intended for clarification purposes

Page 31, clarification to lines 31.24 and 31.25

Page 32 & 33, Line 32.26 to 33.4: “as an alternate to a sewage pump system only in one- or two-family dwellings when gravity flow is not possible. Not more than one bathroom group is permitted to discharge into a macerating toilet system. One bathroom group consists of: a toilet; a lavatory; and a shower or bathtub. Components of macerating toilet systems shall be accessible.”

Page 34, addition of Subp. 4 Section 713.8. A new section 718.8 is added to read as follows: 713.8 Single-family and two-family dwellings. Remove “Exception:” line 34.20 and shift over so that section is format as other subparts above. This item was discussed but not approved by the Board (see item 2 below).

Page 35, line 35.27 – should read “11,200/325P – either remove the space and add a comma or just remove the space in 11 200. The Board decided to leave the space as is so that it reads 11 200. “352” was transposed and was amended to read “325”

Page 36, line 36.13 to read “Section 720.” Line 36.22, add “as amended” after 712

Page 38, line 38.22 – recommended changing to an “Exception”

Page 39, deletion of the word “including” on line 39.2 and the word “square” on line 39.12.

39.2, add a comma after the word “drains,”

Page 43, lines 43.1 and 43.2 – change the wording and move to line 42.23 in between the words “jurisdiction” and “In.” Language was amended as follows: In no case shall water from roofs or any building roof drainage flow onto the public sidewalk.

Page 45 – line 45.19 to 45.23 revised to read as follows: “1109.1 Testing Required. New Building storm drainage systems that are new and parts of existing systems that have been altered, extended, or repaired shall be tested in accordance with section 712 to disclose leaks and defects, except as provided in section 1109.2. Any section of the building storm sewer that passes through contaminated soils or contaminated water must be air tested in accordance with section ~~712.712.3.~~” Todnem noted that “contamination” is defined in the UPC. The proposed change to delete “air” and “712.3” and add “712” was discussed but not approved by the Board (see item 1 and motion below).

The meeting broke for a 15 minute recess.

Discussion returned to Page 45, section 1109.1, specifically language regarding the last sentence regarding contaminated soils or contaminated water. Todnem discussed concerns with 1109.2 Exceptions, Items 1 and 2, and Chair Parizek said that line 45.21 beginning with the word “Any” through 45.23 could be stricken in its entirety and the Board would need to revisit this section. The Board did not approve this change (see below).

Page 47, 1110.2.9 Transition locations. Line 47.20, ASME Standard 45 – what year is this referring to? When the rulemaking process began 2013 was not released. Specifically there is a requirement for 3 feet per second at the discharge that is no longer in the current (2013) standard. **Should Line 47.21 to 47.23 be re-worded if a year is referenced?** It was discussed that if the Standard were referenced then the year should be added. The Board discussed adopting the Standard without adding a year. Legge noted that there are inconsistencies with other standards, specifically on page 48, 4714.1401 Referenced Standards, where some Standards refer to a year and others do not. She asked if a year should be referenced for ASPE Standard 45 and/or IAPMO IGC 155. Tran said that at the time there was not a date available for 155. Line 47.21, ASPE Standard 45, should a year be referenced? Leaving without a date makes it ambiguous and it isn’t clear which Standard is being enforced, is it 2013 or 2011? **The Board’s decision on whether to add dates to ASPE Standard 45 and/or IAPMO IGC 155 (155- 2008?) and whether to re-word the language on page 47, lines 47.21 to 47.23, were tabled until after lunch.**

Page 48, Added to the list of Referenced Standards in part 4714.1401, handwritten note reads “IGC”

Page 50, line 10, add “as amended”

Page 51, line 10, add “collect rainwater” and strike ~~are intended~~

Page 51, line 51.27, Revise to read as follows: “~~Minimum~~ 5 micron or smaller absolute filter”

Page 52, line 52.2 and 52.13 suggested revisions were approved

Page 58, 58.12 add the word “catchment” and on line 58.24 add the word “piping.

Page 59, Add “rainwater catchment to lines 59.8 and 59.12. Line 59.10, add a sentence after the word “code.” to read: “Abandoned systems must comply with Chapter 11, Storm Drainage, as amended.”

A motion to set items aside Section 713.7 (page 34), Section 1110.2.9 Transition locations (page 47, lines 47.21 to 47.23), date references to ASPE Standard 45 (line 48.24) and IAPMO IGC 155, and Section 1109.1 (page 45, lines 45.19 to 45.23), was made by Justin, seconded by Eggen. The vote was unanimous; the motion carried and items noted above were tabled until after lunch.

A motion was made by Justin, seconded by Sterner, to accept the remainder of items and edits, except items set aside in above motion. The vote was unanimous; the motion carried.

The meeting broke from noon to 1:00 p.m. for lunch.

Items tabled for the afternoon were addressed as follows:

Item 1: Section 1109.1 Testing Required.

Page 45 – Any section of the building storm sewer than passes through contaminated soils or contaminated water must be air-tested in accordance with section 712.712.3.

A motion was made by Sterner, seconded by Eggen, to approve the language as shown in Item 1 above. The vote was 7 for with 2 against (Beckel and Moulton). The motion did not pass and language reverted back to how it was printed.

Item 2: Page 34, remove as an exception for Section 713.7 Installation, Line 34.20, and include as a new sub-part titled Section 713.8.

Subp. 4. Section 713.8. A new section 713.8 is added to read as follows: 713.8 Single-family and two-family dwellings. Exception: Single-family and two-family dwellings and buildings or structures accessory thereto, when connected to an approved private sewage disposal system prior to the time of connecting the premises to the public sewer need not connect to the public sewer when there is insufficient grade or slope to permit drainage to the public sewer by gravity and the following conditions are met:
Line 35.2: (3) written permission has been obtained from the Authority Having Jurisdiction.

There were no concerns to move as an exception to a new section.

Chair Parizek announced that a Board member had to depart therefore no changes can be accepted to any sections unless brought back for a special board meeting. Sections must remain as is.

All present Board members agreed to move forward with the rule draft as is and not accept additional items that were previously tabled.

Wendy reminded members that completed Variance requests need to be addressed within 60 days after a **completed** Petition for Variance has been received. The new Petition for Variance needs to be reviewed to determine if it is complete and if it is then a special board meeting would need to be scheduled to address it.

B) Review of SONAR for 4714 proposed rules

Modifications made to the rule draft will need to be reflected in the SONAR. The SONAR does not need approval by the Board members; however, it should be reviewed and in particular the following sections were addressed: Page 4, items (5) and (6). Wendy noted that specific expenses or savings should be placed into the SONAR; Pages 5 & 6, Additional Notice items 1 to 28 should include all organizations and groups affected by the rules; Page 6 & 7 Cost of Complying for Small Business or City should be reviewed and the Board could vote to say “they have determined” or “they have not determined” that the cost of complying with the proposed rules in the first year after the rules take effect will not exceed \$25,000 for any small business or small city.

The Board took a ten minute recess to review SONAR sections as noted below.

Page 4, Item # 5

“Plumbers, municipal inspection departments and designers ~~will~~may need to purchase copies of the UPC. “

Page 4, Item # 6

No comments

Page 5, Additional Notice:

Add the following items after item 28:

- All Minnesota licensed Building Officials
- All licensed plumbers and plumbing contractors
- Water Conditioning Engineers
- City Engineers Association of Minnesota
- The Nursery and Landscape Association
- MOWA
- American Waterworks Association, MN Chapter

Page 6 & 7, Cost of Complying for small business or city:

Will there be a cost of more than \$25,000 to a small business to train their employees? The Board said no, there would not be a cost of more than \$25,000 to a small business. Legge suggested that based on the Board’s consideration and conclusion, language should be added as follows: Nothing in this code is going to require a business to put in new equipment. Costs for existing systems include the testing of testable devices for backflow prevention and the number of devices that need to be tested has expanded – the new rules will allow additional sewer materials that are cheaper, less expensive sewer liners, no longer requiring a 5-year re-build, and single-wall heat exchangers offer cost savings over double-wall.

C) **Procedures for Variances:**
Legge referred to MN Statutes, section 14.055, Rule Variances; Standards and 14.056 Rule Variances; Procedures.

MN STATUTES, SECTION 14.055, RULE VARIANCES; STANDARDS.

*Subdivision 1. **Authority.** A person or entity may petition an agency for a variance from a rule adopted by the agency, as it applies to the circumstances of the petitioner.*

Wendy noted that the Variance has prospective effect only – you only ask for variances for items in the future; they cannot apply to something that has already happened. The agency can attach certain conditions but you can only grant a variance to a rule. The Board does not have authority to grant a variance to a statute or court order. There are certain circumstances in which granting a variance is mandatory – as shown in Subd. 3 below:

Subd. 3. *Mandatory variances.*

An agency shall grant a variance from a rule as applied to the particular circumstances of the petitioner, if the agency finds that the application of the rule, as applied to the circumstances of that petitioner, would not serve any of the purposes of the rule.

There are also certain circumstances when granting a variance is optional as explained in Subd. 4 below:

Subd. 4. *Discretionary variances.*

An agency may grant a variance if the agency finds that:

- (1) application of the rule to the petitioner would result in hardship or injustice;*
- (2) variance from the rule would be consistent with the public interest; and*
- (3) variance from the rule would not prejudice the substantial legal or economic rights of any person or entity.*

In terms of the procedures, MN Statutes 14.056 Rule Variances: Procedures, Subdivision 1, items 1 to 7 are required. Legge noted a Petition for Variance must include all of the seven items listed below:

MN STATUTES, SECTION 14.056, RULE VARIANCES; PROCEDURES.

Subdivision 1. *Contents of variance petition.*

A petition for a variance under section [14.055](#) must include the following information:

- (1) the name and address of the person or entity for whom a variance is being requested;*
- (2) a description of and, if known, a citation to the specific rule for which a variance is requested;*
- (3) the variance requested, including the scope and duration of the variance;*
- (4) the reasons that the petitioner believes justify a variance, including a signed statement attesting to the accuracy of the facts asserted in the petition;*
- (5) a history of the agency's action relative to the petitioner, as relates to the variance request;*
- (6) information regarding the agency's treatment of similar cases, if known; and*

(7) the name, address, and telephone number of any person the petitioner knows would be adversely affected by the grant of the petition.

The Board does not have budget and the department won't charge a fee therefore Subd. 2 Fees can be skipped.

Subd. 3 Notice – Legge said persons that would be adversely affected need to be notified per the language as shown below:

Subd. 3. Notice.

In addition to any notice required by other law, an agency shall make reasonable efforts to ensure that persons or entities who may be affected by the variance have timely notice of the request for a variance. The agency may require the petitioner to serve notice on any other person or entity in the manner specified by the agency.

The Board can request additional information from the petitioner as shown below:

Subd. 4. Additional information.

Before granting or denying a variance petition, an agency may request additional information from the petitioner.

Subd. 5. Order; timing.

*An agency must issue a written order granting or denying a variance and specifying the scope and period of any variance granted. The order must contain an agency statement of the relevant facts and the reasons for the agency's action. The agency shall grant or deny a variance petition as soon as practicable, and **within 60 days of receipt of the completed petition, unless the petitioner agrees to a later date.** Failure of the agency to act on a petition within 60 days constitutes approval of the petition.*

The Board needs to act to determine if a Variance can be granted by reviewing the variance for completeness. Legge proposed that for future variance petitions the Board give certain authorities to the Chair of the Board for purposes of getting needed information in a timely manner and giving required notice in a timely manner. Legge prepared a Resolution for dealing with variance petitions as shown below:

RESOLUTION

It is hereby resolved that the Plumbing Board Chair is authorized to take the following actions in connection with a petition for a variance submitted to the Board under Minnesota Statutes § 14.055:

- 1. Require the Petitioner to submit additional information in connection with the Petition if the Chair believes that the Petition does not contain all information required by Minnesota Statutes § 14.056, subdivision 1, or if the Chair believes that the Board needs additional information in order to determine whether to grant or deny the requested variance;*

2. *Require the Petitioner to serve notice, in the manner determined by the Chair, on any person or entity who may be affected by the variance. This includes not only persons or entities listed by the Petitioner under Minnesota Statutes § 14.056, subdivision 1(7), but also any other person or entity who, in the opinion of the Chair, may be affected by the variance;*
3. **Enter into an agreement with the Petitioner to extend the 60 day deadline for the Board to grant or deny the variance; and**
4. **Charge the Petitioner a variance fee in accordance with section 14.056, Subd. 2, including entering into an agreement on the costs and the timing and manner of payment.**

A motion was made by Justin, seconded by Kittelson, to accept the Resolution with changes noted in bold for #3 and #4 as shown above. The vote was unanimous; the motion carried.

D) Petition for Variance – Manitou Ridge Golf Course (See Attachment #3)

The Board reviewed procedural requirements in Subdivision 1, Items 1 to 7 of MN Statutes 14.056, for completeness and Wendy noted that Notice should have been given to persons or groups affected, such as the Met Council or the City of White Bear. Wendy noted that if Items 1 to 7 were incomplete or affected parties weren't notified then the Variance should not be addressed.

Procedural items 1 to 7 reviewed for completeness by the Board:

- **Item 1**, complete
- **Item 2**, complete
- **Item 3**, Are they requesting a temporary variance until they take additional action or is it a permanent variance? What is currently being done with it and what locations? Has it been installed at any location? In particular, at Manitou?
- **Item 4**, Wendy does not believe they attest to the accuracy of the facts and said the Board should ask for a signed statement from the Petitioner attesting to the accuracy of the facts.
- **Item 5**, the Board can request any information the Petitioner might have in regards to the Department but only in regards to this Variance request. The department's action relates only to this Variance. Under Subd. 4 the Board can always request additional information such as a denial from the department.

- **Item 6**, The Board can ask for this information as it relates to similar cases, locations and permitting process used for the installations. Specifically, the Board can request information regarding the Department’s actions dealing with Keller and information regarding the City of Minneapolis’s actions dealing with Mendakota (water stacks installed). Did Minneapolis give Mendakota a Variance – the Petitioner should provide this information as well.
- **Item 7**, Need to request name, address, and telephone number of any person the petitioner knows would be adversely affected by the grant of the petition. Subpart 3 allows the Board to ask the Petitioner to give notice to persons or agencies affected. Agencies such as: MPCA, Met Council, The Department of Health (water quality / reuse), City of White Bear Lake, and any other agencies or individuals that might be affected by it. The Board can request that the Petitioner contact particular entities PLUS list any other individuals or agencies that might be adversely affected.

The Board needs to grant authority to Chair Parizek to assess a fee and enter into an agreement with Manitou Ridge Golf Course. In addition, the Board needs to note if there is any information needed for the variance before granting or denying the petition. Wendy noted that the Board could request that the Petitioner contact affected agencies and satisfactorily address all concerns as per language in item 7 above.

Legge clarified the Board needs to grant Chair Parizek the authority to determine a fee and negotiate the agreement and timing and manner of payment with the Petitioner. Chair Parizek asked for a motion that the Resolution that was adopted earlier also apply to the Petition for Variance from Manitou Ridge Golf Course.

A motion made by Flagg, seconded by Moulton, to grant Chair Parizek the authority to determine a fee and negotiate the agreement and timing and manner of payment with the Petitioner (Manitou Ridge Golf Course). The vote was unanimous; the motion carried.

VII. Complaints
No complaints

VIII. Open Forum
Nothing brought forth

IX. Board Discussion
There will be a five state conference February 25-27 at the Earl Brown Center in the Twin Cities. This event will provide an opportunity to discuss reciprocity with other states.

X. Announcements

Next regularly scheduled meetings – all meetings will be held at 9:30 a.m. in the Minnesota Room. Executive Committee meetings occur at 8:00 a.m., prior to each regular meeting.

- April 21, 2015
- July 21, 2015
- October 20, 2015

John discussed expiring board members and hoped that everyone would re-apply.

XI. Adjournment

A motion was made by Moulton, seconded by Flagg, to adjourn the meeting at 3:26 p.m.

Respectfully submitted,

Phillip Sterner
Phillip Sterner
Secretary

Suggested edits to Board

10/07/14

10.14.14 REVISOR
w/ additions for 10/21/14 mtg

SS/DI

RD4139

λ = add new language
⊕ = new line

Minnesota Plumbing Board

[] = not to be added, instructional
— or ⊖ = delete

1.2 Proposed Amendment to Rules Governing the Plumbing Code and Adopting the
1.3 2012 Uniform Plumbing Code, with Amendments

1.4 **4714.0050 TITLE; INCORPORATION BY REFERENCE.**

1.5 Chapters 2 to 11, 14, and 17 of the 2012 edition of the Uniform Plumbing Code
1.6 (UPC) as promulgated by the International Association of Plumbing and Mechanical
1.7 Offices (IAPMO), Ontario, California, and UPC appendices A, B, and I, except for
1.8 IS 12-2006, IS 13-2006, IS 26-2006, SIS 1-2003, and SIS 2-2013 of appendix I, are
1.9 incorporated by reference and made part of the Minnesota Plumbing Code except as
1.10 qualified by the applicable provisions in chapter 1300, and as amended in this chapter. The
1.11 UPC is not subject to frequent change and a copy of the UPC, with amendments for use in
1.12 Minnesota, is available in the office of the commissioner of labor and industry. Portions of
1.13 this chapter reproduce text and tables from the UPC, reproduced with permission. The
1.14 UPC is copyright 2012 by the IAPMO. All rights reserved.

1.15 **4714.0100 BASIC PLUMBING PRINCIPLES.**

1.16 This code is founded upon certain basic principles of environmental sanitation
1.17 and safety through properly designed, acceptably installed, and adequately maintained
1.18 plumbing systems. Some of the details of plumbing construction may vary, but the basic
1.19 sanitary and safety principles desirable and necessary to protect the health of the people
1.20 are the same everywhere. As interpretations may be required, and as unforeseen situations
1.21 arise that are not specifically covered in this code, the 23 principles in items A to W
1.22 shall be used to define the intent.

1.23 A. All premises intended for human habitation, occupancy, or use shall be
1.24 provided with a potable water supply that meets the requirements of the commissioner of
1.25 health. The water supply shall not be connected with unsafe water sources nor shall it
1.26 be subject to the hazards of backflow or back-siphonage.

2.1 B. Proper protection shall be provided to prevent contamination of food, water,
2.2 sterile goods, and similar materials by backflow of sewage. When necessary, the fixtures,
2.3 devices, or appliances shall be connected indirectly with the building drainage system.

2.4 C. Each family dwelling unit shall have at least one water closet, one lavatory,
2.5 one kitchen-type sink, and one bathtub or shower to meet the basic requirements of
2.6 sanitation and personal hygiene. All other structures for habitation shall be equipped
2.7 with sufficient sanitary facilities.

2.8 D. The building sewer in every building with installed plumbing fixtures
2.9 and intended for human habitation, occupancy, or use when located on premises where
2.10 the Authority Having Jurisdiction has determined that a public sewer is available shall
2.11 be connected to the public sewer.

2.12 E. The building drainage system shall be designed to provide adequate
2.13 circulation of air in all pipes with no danger of siphonage, aspiration, or forcing of trap
2.14 seals under conditions of ordinary use.

2.15 F. The drainage system shall be designed, constructed, and maintained to conduct
2.16 the waste water with velocities that prevent fouling, deposition of solids, and clogging.

2.17 G. The drainage system shall be provided with an adequate number of cleanouts
2.18 so arranged that in case of stoppage the pipes may be readily cleaned.

2.19 H. Where a building drainage system may be subjected to backflow of sewage,
2.20 suitable provision shall be made to prevent overflow in the building.

2.21 I. Each vent terminal shall extend to the outer air and be so installed as to
2.22 minimize the possibilities of clogging and the return of foul air to the building.

2.23 J. No substance that will clog or accentuate clogging of pipes, produce
2.24 explosive mixtures, destroy the pipes or their joints, or interfere unduly with the sewage
2.25 disposal process shall be allowed to enter the drainage system.

3.1 K. The piping of the plumbing system shall be of durable material free from
3.2 defective construction and designed and constructed to give satisfactory service for its
3.3 reasonable expected life.

3.4 L. The plumbing system shall be subjected to adequate tests and to inspections
3.5 in a manner that will disclose all leaks and defects in the work or the material.

3.6 M. Plumbing systems shall be maintained in a safe and serviceable condition
3.7 from the standpoint of both mechanics and health.

3.8 N. Plumbing shall be installed with due regard to preservation of the strength
3.9 of structural members and prevention of damage to the walls and other surfaces through
3.10 fixture usage.

3.11 O. Plumbing fixtures shall be made of durable, smooth, nonabsorbent, and
3.12 corrosion-resistant material and be free from concealed fouling surfaces.

3.13 P. Plumbing fixtures, devices, and appurtenances shall be supplied with water
3.14 in sufficient volume and at pressures adequate to enable them to function properly and
3.15 without undue noise under normal conditions of use.

3.16 Q. Plumbing fixtures shall be designed and adjusted to use the minimum
3.17 quantity of water consistent with proper performance and cleaning. Hot water shall be
3.18 supplied to all plumbing fixtures which normally need or require hot water for their
3.19 proper use and function.

3.20 R. All plumbing fixtures shall be installed with regard to spacing as to be
3.21 accessible for their intended use and cleansing.

3.22 S. Each fixture shall be provided with a separate, accessible, self-scouring,
3.23 reliable trap placed as near to the fixture as possible.

3.24 T. No water closet or similar fixture shall be located in a room or compartment
3.25 that is not properly lighted and ventilated.

4.1 U. If water closets or other plumbing fixtures are installed in a building where
 4.2 there is no public sewer available as determined by the Authority Having Jurisdiction,
 4.3 suitable provisions shall be made for treatment of the building sewage by methods that
 4.4 meet the requirements of rules administered by the Pollution Control Agency.

4.5 V. Devices for heating and storing water shall be designed and installed to
 4.6 prevent all dangers from explosion and overheating.

4.7 W. Sewage or other waste shall not be discharged into surface or subsurface
 4.8 water unless it first has been subjected to an acceptable form of treatment approved by the
 4.9 Pollution Control Agency.

4.10 **4714.0101 CONFORMANCE WITH CODE.**

4.11 Subpart 1. **Scope.** As provided in Minnesota Statutes, sections 326B.43 and

4.12 ^{326B} ~~342B~~.52, this code applies to all new plumbing installations performed anywhere in the
 4.13 state, including additions, extensions, alterations, and replacements.

4.14 Subp. 2. **New buildings.** All plumbing materials and plumbing systems or parts
 4.15 thereof shall be installed to meet the minimum provisions of this code.

4.16 Subp. 3. **Existing buildings.** In existing buildings and premises in which plumbing
 4.17 systems, drainage systems, or other work regulated by this code are to be added, altered,
 4.18 renovated, or replaced, the new materials and work shall meet the provisions of this code. If
 4.19 the Authority Having Jurisdiction finds that the full performance of bringing the work into
 4.20 compliance with all requirements of this code would result in exceptional or undue hardship
 4.21 by reason of excessive structural or mechanical difficulty or impracticability, a deviation
 4.22 may be granted by the Authority Having Jurisdiction only to the extent the deviation can
 4.23 be granted without endangering the health and safety of the occupants and the public.

4.24 Subp. 4. **Changes in building occupancy.** A plumbing system that is a part of a
 4.25 building or structure undergoing a change in use or occupancy, as defined in the building

5.1 code, shall be in accordance with the requirements of this code that are applicable to
5.2 the new use or occupancy.

5.3 Subp. 5. **Moved buildings.** Plumbing systems that are part of buildings or structures
5.4 moved into this jurisdiction shall be in accordance with this code for new installations. Parts
5.5 of the plumbing systems of a building or part thereof that is moved from one foundation to
5.6 another, or from one location to another, shall be completely tested as new work, except
5.7 that walls or floors need not be removed during such tests where other equivalent means
5.8 of inspection acceptable to the Authority Having Jurisdiction are provided.

5.9 Subp. 6. **Health and safety.** No provision of this code shall be deemed to require
5.10 a change in a portion of a plumbing or drainage system or other work regulated by this
5.11 code in or on an existing building or lot where the work was installed and is maintained in
5.12 accordance with rule in effect before the effective date of this code. Where the plumbing
5.13 or drainage system or other work regulated by this code is determined by the Authority
5.14 Having Jurisdiction to be dangerous, unsafe, insanitary or a nuisance or a hazard to life,
5.15 health, or property then the owner or owner's agent shall be responsible for bringing the
5.16 existing plumbing installation within the provisions of this code. Where these conditions
5.17 exist, the owner or owner's agent shall be responsible for installing additional plumbing or
5.18 making such corrections as may be necessary to abate such nuisance or hazard and bring
5.19 the existing plumbing installation within the provisions of this code.

5.20 Subp. 7. **Commissioner's authority.** The commissioner retains the ultimate
5.21 authority to enforce this code and Minnesota Statutes, sections 326B.41 to 326B.59,
5.22 regardless of whether the administrative authority is the commissioner or the governing
5.23 body of a governmental subdivision.

5.24 **4714.0203 TERMS DEFINED BEGINNING WITH A.**

5.25 Subpart 1. **Added definitions.** UPC section 203.0 is modified by adding the
5.26 following definition:

6.1 Administrative Authority - Means the commissioner.

6.2 Exception: When a governmental subdivision adopts and maintains a comprehensive
6.3 plumbing enforcement program that is conducted by personnel who are knowledgeable
6.4 about plumbing installation requirements, and includes enforcement of all code
6.5 provisions including materials, methods, inspection, and testing, the administrative
6.6 authority shall be the governing body of the adopting unit of government or a duly
6.7 designated representative of the governing body who is either an employee of the
6.8 governing body or a person working under contract with the governing body.

6.9 Approved - Means approval by the administrative authority, pursuant to the Minnesota
6.10 Plumbing Code, by reason of inspection, investigation, or testing; accepted principles;
6.11 computer simulations; research reports; or testing performed by a nationally recognized
6.12 testing laboratory.

6.13 Subp. 2. Amended definitions. UPC section 203.0 is modified by amending the
6.14 following definition:

6.15 Authority Having Jurisdiction - Unless otherwise specified in this code, the term

6.16 Authority Having Jurisdiction has the same meaning as administrative authority.

4714.0204 Terms defined beginning with B. & Barometric loop - [see pg. 21 for the definition]
6.17 4714.0205 TERMS DEFINED BEGINNING WITH C.

6.18 Subpart 1. Amended definitions. UPC section 205.0 is modified by amending the
6.19 following definitions:

6.20 Certified Backflow Assembly Tester - Has the same meaning as backflow prevention
6.21 tester defined in Minnesota Statutes, section 326B.42, subdivision 1c.

6.22 Clear Water Waste - Uncontaminated water discharges, subsoil discharges, and similar
6.23 discharges.

6.24 Code - For purposes of this chapter, "this code" or "the code" means the Minnesota
6.25 Plumbing Code, Minnesota Rules, chapter 4714.

7.1 Subp. 2. Added definitions. UPC section 205.0 is modified by adding the following
7.2 definition:

7.3 Commissioner - Means the commissioner of labor and industry or a duly designated
7.4 representative of the commissioner who is either an employee of the Department of Labor
7.5 and Industry or a person working under contract with the department.

7.6 **4714.0206 TERMS DEFINED BEGINNING WITH D.**

7.7 UPC section 206.0 is modified by amending the following definition:

7.8 Drainage System - Includes all the piping within public or private premises that conveys
7.9 sewage, rainwater, or other liquid wastes to a legal point of disposal, but does not include
7.10 the mains of a public sewer system or a public sewage treatment or disposal plant.

7.11 **4714.0210 TERMS DEFINED BEGINNING WITH H.**

7.12 Subpart 1. Amended definition. UPC section 210.0 is modified by amending the
7.13 following definition:

7.14 Hydromechanical Grease Interceptor - A plumbing appurtenance or appliance that is
7.15 installed in a sanitary drainage system to intercept nonpetroleum fats, oil, and grease
7.16 (FOG) from a wastewater discharge and is identified by flow rate, and separation and
7.17 retention efficiency. The design incorporates air entrainment, hydromechanical separation,
7.18 interior baffling, or barriers in combination or separately, and one of the following:

7.19 A - External flow control, with air intake (vent), directly connected.

7.20 B - External flow control, without air intake (vent), directly connected.

7.21 C - Without external flow control, directly connected.

7.22 These interceptors comply with the requirements of Table 1014.2.1. Hydromechanical
7.23 grease interceptors are generally installed inside.

7.24 Subp. 2. Added definitions. UPC section 210.0 is modified by adding the following
7.25 definition:

8.1 Health Authority - Means the state health department or local public health agency that
8.2 has authority established under law to enforce rules governing drinking water supply.

8.3 **4714.0218 TERMS DEFINED BEGINNING WITH P.**

8.4 UPC section 218.0 is modified by amending the following definitions:

8.5 Plumbing System - Includes all potable water, building supply, and distribution pipes;
8.6 all plumbing fixtures and traps; all drainage and vent pipes; and all building drains and
8.7 building sewers, including their respective joints and connections, devices, receptors, and
8.8 appurtenances within the property lines of the premises and shall include potable water
8.9 piping, potable water treating or using equipment, and nonpotable water piping serving
8.10 plumbing fixtures.

8.11 Potable Water - Water that is satisfactory for drinking, culinary, and domestic purposes
8.12 and that meets the requirements of the Health Authority.

8.13 Private Sewage Disposal System - A subsurface sewage treatment system designed for
8.14 use apart from a public sewer as regulated under the rules administered by the Pollution
8.15 Control Agency.

8.16 **4714.0220 TERMS DEFINED BEGINNING WITH R.**

8.17 UPC section 220.0 is modified by adding the following definition:

8.18 Registered Professional Engineer - For purposes of this code, "registered professional
8.19 engineer," "engineer," or "registered engineer" means a person practicing professional
8.20 engineering as described in Minnesota Statutes, section 326.02, subdivision 3, and who is
8.21 licensed in the state of Minnesota as a professional engineer by the Board of Architecture,
8.22 Engineering, Land Surveying, Landscape Architecture, Geoscience, and Interior Design
8.23 under Minnesota Statutes, section 326.10.

8.24 **4714.0221 TERMS DEFINED BEGINNING WITH S.**

8.25 UPC section 221.0 is modified by amending the following definition:

9.1 Single-Family Dwelling - Has the meaning of dwelling, single-family, in Minnesota
9.2 Rules, part 1309.0202, subpart 1.

9.3 **4714.0301 SECTION 301.0 MATERIALS - STANDARDS AND ALTERNATIVES.**

9.4 Subpart 1. Section 301.1. UPC section 301.1 is amended to read as follows:

9.5 **301.1 Minimum Standards.** Pipe, pipe fittings, traps, fixtures, material, and devices
9.6 used in a plumbing system shall:

9.7 (1) be listed or labeled (third-party certified) by a listing agency (accredited conformity
9.8 assessment body);

9.9 (2) comply with the approved applicable recognized standards referenced in this code; and

9.10 (3) be free from defects.

9.11 Plastic pipe and the fittings used for plastic pipe shall meet the requirements of NSF 14.

9.12 Unless otherwise provided for in this code, materials, fixtures, or devices used or entering
9.13 into the construction of plumbing systems, or parts thereof, shall be submitted to the
9.14 Authority Having Jurisdiction for approval.

9.15 **301.1.1 Marking.** Each length of pipe and each pipe fitting, trap, fixture, material,
9.16 and device used in a plumbing system shall have cast, stamped, or indelibly marked
9.17 on it the manufacturer's mark or name, which shall readily identify the manufacturer
9.18 to the end user of the product. Where required by the approved standard that applies,
9.19 the product shall be marked with the weight and the quality of the product. Materials
9.20 and devices used or entering into the construction of plumbing and drainage systems,
9.21 or parts thereof, shall be marked and identified in a manner satisfactory to the
9.22 Authority Having Jurisdiction. The marking shall be done by the manufacturer. Field
9.23 markings shall not be acceptable.

9.24 **301.1.2 Standards.** Standards listed or referred to in this chapter or other chapters
9.25 cover materials that shall conform to the requirements of this code, where used in
9.26 accordance with the limitations imposed in this or other chapters thereof and their
9.27 listing. Where a standard covers materials of various grades, weights, quality, or

10.1 configurations, the portion of the listed standard that is applicable shall be used.
 10.2 Design and materials for special conditions or materials not provided for herein shall
 10.3 be permitted to be used only by special permission of the Authority Having Jurisdiction
 10.4 after the Authority Having Jurisdiction has been satisfied as to their adequacy. A list
 10.5 of accepted plumbing material standards is referenced in Table 1401.1.

10.6 Subp. 2. **Section 301.2.** UPC section 301.2 is amended to read as follows:
 10.7 **301.2 Alternate Materials and Methods of Construction Equivalency.** Nothing in
 10.8 this code is intended to prevent the use of systems, methods, or devices of equivalent or
 10.9 superior quality, strength, fire resistance, effectiveness, durability, and safety over those
 10.10 prescribed by this code. Prior to installation, technical documentation shall be submitted
 10.11 to the Authority Having Jurisdiction to demonstrate equivalency. Unless prohibited by
 10.12 this code or by law, the Authority Having Jurisdiction shall have the authority to approve
 10.13 or disapprove the system, method, or device for the intended purpose.

10.14 However, the exercise of this discretionary approval by the Authority Having
 10.15 Jurisdiction shall have no effect beyond the jurisdictional boundaries of the Authority
 10.16 Having Jurisdiction. An alternate material or method of construction so approved shall not
 10.17 be considered as in accordance with the requirements, intent, or both of this Code for a
 10.18 purpose other than that granted by the Authority Having Jurisdiction where the submitted
 10.19 data does not prove equivalency.

UPC subsections 301.2.1, 301.2.1.1 and 301.2.1.2 are preserved without amendment.
 10.20 Subp. 3. **Section 301.4.6.** UPC section 301.4.6 is amended to read as follows:

10.21 **301.4.6 Inspection and Testing.** The alternative engineered design shall be tested
 10.22 and inspected in accordance with the submitted testing and inspection plan and the
 10.23 requirements of this code. Prior to the final plumbing inspection, the registered
 10.24 professional engineer shall provide written certification to the administrative authority
 10.25 that the system has been visually inspected by the registered professional engineer or
 10.26 the registered professional engineer's designee, and the installation has been properly
 10.27 implemented according to the certified plans, calculations, and specifications.

11.1 **4714.0307 LOCATION.**

11.2 UPC section 307.1 is amended to read as follows:

11.3 **307.1 System.** Except as otherwise provided in this code, no plumbing system, drainage
11.4 system, building sewer, or part thereof shall be located in a lot other than the lot that is the
11.5 site of the building, structure, or premises served by such facilities.

11.6 **4714.0311 INDEPENDENT SYSTEMS.**

11.7 Subpart 1. Section 311.0. UPC section 311.0 title is amended to read as follows:

11.8 **311.0 Use of Public Sewer and Water Systems Required.**

11.9 Subp. 2. Section 311.1. UPC section 311.1 is amended to read as follows:

11.10 **311.1 General.** If a public sewer is available in a street or alley to a building or premises
11.11 and the connection is feasible, liquid waste from any plumbing system in that building
11.12 shall be discharged into the public sewer unless otherwise prohibited by this code or a
11.13 local ordinance. If a public water supply is accessible, the water distribution system shall
11.14 be connected to it unless otherwise permitted by the Authority Having Jurisdiction. A
11.15 private water well taken out of service because of a connection to a public water supply
11.16 shall be maintained pursuant to Minnesota Rules, chapter 4725, Wells and Borings.

11.17 Every building shall have its own independent water and sewer connection except that
11.18 a group of buildings may be connected to one or more sewer manholes on the premises
11.19 that are constructed to standards set by the Authority Having Jurisdiction.

11.20 **4714.0312 PROTECTION OF PIPING, MATERIALS, AND STRUCTURES.**

11.21 Subpart 1. Section 312.7. UPC section 312.7 is amended to read as follows:

11.22 **312.7 Fire-Resistant Construction.** Piping penetrations of fire-resistance-rated walls,
11.23 partitions, floors, floor/ceiling assemblies, roof/ceiling assemblies, or shaft enclosures
11.24 shall be protected in accordance with the State Building Code.

11.25 Subp. 2. Section 312.9. UPC section 312.9 is amended to read as follows:

12.1 **312.9 Steel Nail Plates.** Plastic and copper piping penetrating framing members to within
12.2 1 inch (25.4 mm) of the exposed framing shall be protected by steel nail plates not less
12.3 than No. 18 gauge (0.0478 inches) (1.2 mm) in thickness. The steel nail plate shall
12.4 extend along the framing member not less than 1-1/2 inches (38 mm) beyond the outside
12.5 diameter of the pipe or tubing.

12.6 **Exception:** See Minnesota Rules, chapter 1346, Minnesota Mechanical and Fuel
12.7 Gas Codes.

12.8 **4714.0313 HANGERS AND SUPPORTS.**

12.9 UPC section 313.7 is deleted in its entirety.

12.10 **4714.0314 TRENCHING, EXCAVATION, AND BACKFILL.**

12.11 UPC sections 314.0 to 314.4 are deleted in their entirety.

12.12 **4714.0315 JOINTS AND CONNECTIONS.**

12.13 UPC section 315.1 is amended to read as follows:

12.14 **315.1 Unions.** Approved unions shall be permitted to be used in drainage piping where
12.15 accessibly located in the trap seal or between a fixture and its trap in the vent system,
12.16 except underground or in wet vents, at a point in the water supply system.

12.17 **4714.0317 FOOD-HANDLING ESTABLISHMENTS.**

12.18 UPC section 317.1 is amended to read as follows:

12.19 **317.1 General.** Soil or drain pipes installed over areas where food or drink will be stored,
12.20 prepared, or displayed shall be installed with the minimum number of joints necessary and
12.21 connected to the nearest adequately sized vertical stack with the following provisions:

12.22 (1) Plumbing openings through floors over such areas shall be sealed watertight to the
12.23 floor construction.

12.24 (2) Floor and shower drains installed above such areas shall be equipped with integral
12.25 seepage pans.

12.26 (3) Cleanouts shall be extended through the floor construction above.

13.1 (4) Piping subject to operation at temperatures that will form condensation on the exterior
13.2 of the pipe shall be thermally insulated.

13.3 (5) Where pipes are installed in ceilings above such areas, the ceiling shall be of the
13.4 removable type, or shall be provided with access panels in order to form a ready access
13.5 for inspection of piping.

13.6 **4714.0319 MEDICAL GAS AND VACUUM SYSTEMS.**

13.7 UPC sections 319.0 to 319.1 are deleted in their entirety.

13.8 **4714.0403 WATER-CONSERVING FIXTURES AND FITTINGS.**

13.9 UPC section 403.3 is amended to read as follows:

13.10 **403.3 Urinals.** Urinals shall have an average water consumption not to exceed 1 gallon
13.11 (4 L) of water per flush.

13.12 **403.3.1 Nonwater urinals.** Nonwater urinals shall be listed and comply with the
13.13 applicable standards referenced in Table 1401.1. Nonwater urinals shall have a barrier
13.14 liquid sealant to maintain a trap seal. Nonwater urinals shall permit the uninhibited
13.15 flow of waste through the urinal to the sanitary drainage system. Nonwater urinals
13.16 shall be cleaned and maintained in accordance with the manufacturer's instructions
13.17 after installation. Where a nonwater urinal is installed, a water-supplied fixture shall
13.18 be installed upstream of the nonwater urinal at the end of that same drainage branch.

13.19 **4714.0406 PROHIBITED FIXTURES.**

13.20 UPC section 406.3 is deleted in its entirety.

13.21 **4714.0409 BATHTUBS AND WHIRLPOOL BATHTUBS.**

13.22 UPC section 409.1 is amended to read as follows:

13.23 **409.1 Application.** Bathtubs and whirlpool bathtubs shall comply with the applicable
13.24 standards referenced in Table 1401.1. Pressure sealed doors within bathtubs and whirlpool
13.25 bathtub enclosures shall comply with the applicable standards referenced in Table 1401.1.

14.1 Whirlpool pedicure tubs shall comply with general requirements and water retention
 14.2 sections of ASME A112.9.7 or IAPMO IGC 155, Pipeless Whirlpool Bathtub Appliances.

[^] A112.19.7, Hydromassage Bathtub Appliances,

14.3 **4714.0415 DRINKING FOUNTAINS.**

14.4 UPC section 415.2 is amended to read as follows:

14.5 **415.2 Public Use Fountains.** Installation of a combined cold water faucet and drinking
 14.6 fountain is prohibited for public use. If a drinking fountain is provided at a public use
 14.7 sink, it shall have at least an 18-inch separation from any other faucet spout.

14.8 **4714.0418 FLOOR DRAINS.**

14.9 Subpart 1. Section 418.4. UPC section 418.4 is amended to read as follows:

14.10 **418.4 Food Storage Areas.** Where drains are provided in storerooms, walk-in freezers,
 14.11 walk-in coolers, refrigerated equipment, or other locations where food is stored, the drains
 14.12 shall have indirect waste piping. Separate waste pipes shall be run from each food storage
 14.13 area, each with an indirect connection to the building sanitary drainage system. Traps shall
 14.14 be provided in accordance with Section 801.2.2 and shall be vented.

14.15 Indirect drains shall be permitted to be located in freezers or other spaces where
 14.16 freezing temperatures are maintained, provided that traps, where supplied, shall be located
 14.17 where the seal will not freeze. Otherwise, the floor of the freezer shall be sloped to a floor
 14.18 drain located outside of the storage compartment.

14.19 Subp. 2. Section 418. UPC section 418 is amended by adding the following
 14.20 subsections.

14.21 **418.6 Elevator Pit Drain.** An elevator pit drain shall discharge to the sanitary sewer using
 14.22 an indirect connection that precludes the possibility of sewage backup into the pit. If a
 14.23 sump is used, it shall be outside the pit with a dry pan drain flowing to it.

14.24 **418.7 Garage and Parking Area Floor Drains.** Floor area drains in open parking areas,
 14.25 including open areas of parking ramps, shall discharge to the storm sewer or to a place of
 14.26 disposal satisfactory to the sewer authority. Floor drains in parking areas that are enclosed,

15.1 and floor drains in areas open or enclosed that are used for maintenance or as vehicle wash
15.2 bays, shall discharge to the sanitary sewer if a municipal sewer is available. An oil and
15.3 flammable liquid interceptor shall be provided if required by Section 1017.

15.4 **Exception:** Floor drains in private garages serving one- and two-family dwellings
15.5 may discharge to daylight if approved by the administrative authority.

15.6 **4714.0420 SINKS.**

15.7 UPC section 420.3 is amended to read as follows:

15.8 **420.3 Waste Outlet.** Kitchen and laundry sinks shall have a waste outlet and fixture
15.9 tailpiece not less than 1-1/2 inches (40 mm) in diameter, except commercial pot and
15.10 scullery sinks shall be provided with waste outlets not less than 2 inches (50 mm) in
15.11 diameter. Service sinks shall have a waste outlet and fixture tailpiece not less than 2 inches
15.12 (50 mm) in diameter. Fixture tailpieces shall be constructed from the materials specified in
15.13 Section 701.1 for drainage piping, provided, however, that the connections where exposed
15.14 or accessible shall be permitted to be of seamless drawn brass not less than No. 20 B & S
15.15 Gauge (0.032 inches) (0.81 mm). Waste outlets shall be provided with an approved strainer.

15.16 **4714.0421 FIXTURES AND FIXTURE FITTINGS FOR PERSONS WITH**
15.17 **DISABILITIES.**

15.18 UPC section 421.2 is amended to read as follows:

15.19 **421.2 Limitation of Hot Water Temperature for Public Lavatories.** Hot water
15.20 delivered from public-use lavatories shall be limited to a maximum temperature of 110°
15.21 F (43° C) by a device that is in accordance with ASSE 1070 or CSA B125.3. The water
15.22 heater thermostat shall not be considered a control for meeting this provision.

15.23 **4714.0422 MINIMUM NUMBER OF REQUIRED FIXTURES.**

15.24 Subpart 1. Section 422.1. UPC section 422.1 is amended to read as follows:

15.25 **422.1 Required Minimum Number of Fixtures.** For all premises subject to Minnesota
15.26 Rules, chapter 4714, plumbing fixtures shall be provided for the type of building

16.1 occupancy and in the minimum number listed in Minnesota Rules, chapter 1305,
16.2 Minnesota Building Code.

16.3 Subp. 2. Sections 422.1.1 to 422.5. UPC sections 422.1.1 to 422.5, including tables,
16.4 are deleted in their entirety.

16.5 Subp. 3. Table 422.1. UPC Table 422.1 is deleted in its entirety.

16.6 **4714.0501 GENERAL.**

16.7 UPC section 501.1 is amended to read as follows:

16.8 **501.1 Applicability.** The regulations of this chapter as amended in this code shall govern
16.9 the construction, location, and installation of fuel-burning and other water heaters heating
16.10 potable water. The minimum capacity for storage water heaters shall be in accordance
16.11 with the first hour rating listed in Table 501.1. Design, construction, and workmanship
16.12 shall be in accordance with accepted engineering practices, manufacturer's instructions,
16.13 and applicable standards and shall be of such character as to secure the results sought to be
16.14 obtained by this code. No water heater shall be hereinafter installed that does not comply
16.15 with the type and model of each size thereof approved by the Authority Having Jurisdiction.

16.16 **4714.0503 INSPECTION.**

16.17 UPC sections 503.0 to 503.2 are deleted in their entirety.

16.18 **4714.0504 WATER HEATER REQUIREMENTS.**

16.19 Subpart 1. Sections 504.1 to 504.2. UPC sections 504.1 to 504.2 are deleted in
16.20 their entirety.

16.21 Subp. 2. Section 504.6. UPC section 504.6 is amended to read as follows:

16.22 **504.6 Temperature, Pressure, and Vacuum Relief Devices.** The installation of
16.23 temperature, pressure, and vacuum relief devices, or combinations thereof, shall be
16.24 installed in accordance with the terms of their listings and the manufacturer's installation
16.25 instructions. A shutoff valve shall not be placed between the relief valve and the water

17.1 heater or on discharge pipes between the valves and the atmosphere. The hourly British
17.2 thermal units (Btu) (kW·h) discharge capacity or the rated steam relief capacity of the
17.3 device shall be not less than the input rating of the water heater. [NFPA 54:10.28.5]

17.4 **4714.0505 OIL-BURNING AND OTHER WATER HEATERS.**

17.5 UPC section 505.4.1 is deleted in its entirety.

17.6 **4714.0506 AIR FOR COMBUSTION AND VENTILATION.**

17.7 UPC sections 506.0 to 506.9 are deleted in their entirety.

17.8 **4714.0507 OTHER WATER HEATER INSTALLATION REQUIREMENTS.**

17.9 Subpart 1. Sections 507.6 to 507.11 and 507.14 to 507.23. UPC sections 507.6 to
17.10 507.11 and 507.14 to 507.23 are deleted in their entirety.

17.11 Subp. 2. Section 507.5. UPC section 507.5 is amended to read as follows:

17.12 **507.5 Relief Valve Discharge.** Discharge from a relief valve into a water heater pan
17.13 shall be prohibited. Discharge relief valves shall terminate to a safe place of disposal
17.14 or within 18 inches of the floor.

17.15 **4714.0508 APPLIANCES ON ROOFS.**

17.16 UPC sections 508.0 to 508.4 are deleted in their entirety.

17.17 **4714.0509 VENTING OF APPLIANCES.**

17.18 UPC sections 509.0 to 509.14, including all tables and figures, are deleted in their
17.19 entirety.

17.20 **4714.0510 SIZING OF CATEGORY I VENTING SYSTEMS.**

17.21 UPC sections 510.0 to 510.2, including all tables and figures, are deleted in their
17.22 entirety.

17.23 **4714.0511 DIRECT-VENT APPLIANCES.**

17.24 UPC sections 511.0 to 511.1 are deleted in their entirety.

18.1 **4714.0601 HOT AND COLD WATER REQUIRED.**

18.2 UPC section 601.1 is amended to read as follows:

18.3 **601.1 General.** Each plumbing fixture shall be provided with an adequate supply
18.4 of potable running water piped to it in an approved manner, so arranged as to flush
18.5 and keep the fixture in a clean and sanitary condition without danger of backflow or
18.6 cross-connection. Water closets and urinals shall be flushed by means of an approved
18.7 flush tank or flushometer valve.

18.8 **Exception:** Listed fixtures that do not require water for their operation and are not
18.9 connected to the water supply.

18.10 **601.1.1 Hot Water Required.** In occupancies where plumbing fixtures are installed for
18.11 private use, hot water shall be required for bathing, washing, laundry, cooking purposes,
18.12 dishwashing, and maintenance. In occupancies where plumbing fixtures are installed for
18.13 public use, hot water shall be required for bathing and washing purposes. This requirement
18.14 shall not supersede the requirements for individual temperature control limitations for
18.15 public lavatories, bidets, bathtubs, whirlpool bathtubs, and shower control valves.

18.16 **601.1.2 Hot Water Recirculation.** Hot water supply systems in four-story buildings or
18.17 higher, or buildings where the developed length of hot water piping from the source of
18.18 hot water supply to the farthest fixture supplied exceeds 100 feet, shall be of the return
18.19 circulation type.

18.20 **4714.0602 UNLAWFUL CONNECTIONS.**

18.21 Subpart 1. Section 602.2. UPC section 602.2 is amended to read as follows:

18.22 **602.2 Cross-Contamination.** Unless there is provided a backflow prevention device
18.23 approved for the potential hazard and maintained in accordance with this code, no person
18.24 shall make a connection or allow one to exist between pipes or conduits carrying domestic
18.25 water supplied by a public or private building supply system, and (1) pipes, conduits, or
18.26 fixtures containing or carrying water from any other source or containing or carrying water

19.1 that has been used for any purpose whatsoever, or (2) any piping carrying chemicals,
 19.2 liquids, gases, or substances whatsoever.
 19.3 Each point of use shall be separately protected where potential cross-contamination of
 19.4 individual units exists. Water used for cooling or heating of equipment or other purposes
 19.5 shall not be returned to the potable water system. Such water shall be discharged into the
 19.6 drainage system through an air-gapped indirect waste or other approved method of disposal.

19.7 Subp. 2. Section 602.4. UPC section 602.4 is amended to read as follows:
 19.8 602.4 Approval by Authority. No water piping supplied by a private water supply system
 19.9 shall be connected to any other source of supply without the approval of the Authority
 19.10 Having Jurisdiction.

19.11 4714.0603 CROSS-CONNECTION CONTROL.

19.12 Subpart 1. Section 603.2. UPC section 603.2 is amended to read as follows:
 19.13 603.2 Approval of Devices or Assemblies. Before a device or an assembly is installed
 19.14 for the prevention of backflow, it shall have first been approved. Devices or assemblies
 19.15 shall be tested in accordance with recognized standards or other standards acceptable to
 19.16 the Authority Having Jurisdiction. Backflow prevention devices and assemblies shall
 19.17 comply with Table 603.2, except for specific applications and provisions as stated in
 19.18 Sections 603.5.1 through 603.5.23.

19.19 Devices or assemblies installed in a potable water supply system for protection
 19.20 against backflow shall be maintained in good working condition by the person or persons
 19.21 having control of such devices or assemblies. The devices or assemblies shall be tested
 19.22 at the time of installation, repair, or relocation and not less than on an annual schedule
 19.23 thereafter, or more often where required by the Authority Having Jurisdiction. Where
 19.24 found to be defective or inoperative, the device or assembly shall be repaired or replaced.
 19.25 No device or assembly shall be removed from use or relocated, or other device or
 19.26 assembly substituted, without the approval of the Authority Having Jurisdiction.

20.1 Testing shall be performed by a certified backflow assembly tester in accordance
20.2 with ASSE Series 5000.

20.3 UPC Table 603.2 is not amended.

20.4 Subp. 2. Section 603.5.4. UPC section 603.5.4 is amended to read as follows:

20.5 603.5.4 Heat Exchangers. Heat exchangers used for heat transfer, heat recovery, or
20.6 solar heating shall protect the potable water system from being contaminated by the
20.7 heat-transfer medium.

20.8 603.5.4.1 Single-Wall Heat Exchanger. Installation of a single-wall heat
20.9 exchanger shall meet all of the following requirements:

20.10 (1) Connected to:

20.11 (a) a low-pressure hot water boiler limited to a maximum of 30 pounds-force
20.12 per square inch gauge (psig) (207 kPa) by an approved safety or relief
20.13 valve; or

20.14 (b) a steam system limited to a maximum of 15 psig (103 kPa).

20.15 (2) The heat-transfer medium is either potable water or contains fluids having a
20.16 toxicity rating or Class of 1.

20.17 (3) Bear a label with the word "Caution," followed by the following statements:

20.18 (a) The heat-transfer medium shall be water or other nontoxic fluid having a
20.19 toxicity rating or Class of 1 as listed in Clinical Toxicology of Commercial
20.20 Products, 5th edition.

20.21 (b) The pressure of the heat-transfer medium shall be limited to a maximum
20.22 of 30 psig (207 kPa) by an approved safety or relief valve.

20.23 The word "Caution" and the statements in letters shall have an
20.24 uppercase height of not less than 0.120 inch (3.048 mm). The vertical
20.25 spacing between lines of type shall be not less than 0.046 inch (1.168
20.26 mm). Lowercase letters shall be compatible with the uppercase letter
20.27 size specifications.

21.1 603.5.4.2 Double-Wall Heat Exchanger. Double-wall heat exchangers
 21.2 shall separate the potable water from the heat-transfer medium by providing
 21.3 a space between the two walls that are vented to the atmosphere.

21.4 Subp. 3. Section 603.5.12. UPC section 603.5.12 is amended to read as follows:

21.5 603.5.12 Beverage Dispensers. Potable water supply to beverage dispensers,
 21.6 carbonated beverage dispensers, or coffee machines shall be protected by an
 21.7 air gap or a vented backflow preventer in accordance with ASSE 1022. For
 21.8 carbonated beverage dispensers, piping materials installed downstream of the
 21.9 backflow preventer shall not be made of copper ~~or~~ be affected by carbon dioxide
 21.10 gas. *and not*

21.11 Subp. 4. Section 603.5.18. UPC section 603.5.18 is amended to read as follows:

21.12 603.5.18 Potable Water Outlets and Valves. Potable water outlets, freeze-proof
 21.13 yard hydrants, combination stop-and-waste valves, or other fixtures that incorporate a
 21.14 stop-and-waste feature that drains into the ground shall not be installed underground
 21.15 except for a freeze-proof yard hydrant that is located at least two feet above the water
 21.16 table and at least ten feet from any sewer or similar source of contamination.

21.17 Subp. 5. Section 603.5. UPC section 603.5 is amended by adding the following
 21.18 subsections:

21.19 603.5.22 Barometric Loop. A barometric loop is an acceptable method of protection
 21.20 of water connections where an actual or potential backsiphonage hazard exists that is

21.21 not subject to backpressure. A barometric loop is a section of pipe in the shape of an
 21.22 inverted "u" located upstream and rising 35 feet above the highest fixture it supplies.

(move to definitions)

21.23 603.5.23 Installation of Testable Backflow Prevention Assembly. Testable
 21.24 backflow prevention assemblies meeting ASSE Standard 1013, 1015, 1020, 1047,
 21.25 1048, or 1056 shall be installed, tested, maintained, and removed in accordance with
 21.26 sections 603.5.23.1 through 603.5.23.4.

22.1 **603.5.23.1 Notification of Installation.** The administrative authority shall be
22.2 notified before installation of a testable backflow prevention assembly. The
22.3 public water supplier shall be notified of the installed testable backflow preventer
22.4 assembly within 30 days following installation on a community public water
22.5 system.

22.6 **603.5.23.2 Testing and Maintenance.** The installation of a testable backflow
22.7 prevention assembly is permitted only when a periodic testing and inspection
22.8 program conducted by qualified personnel is provided by an agency acceptable to
22.9 the administrative authority. Inspection intervals shall not exceed one year. The
22.10 administrative authority may require more frequent testing if deemed necessary
22.11 to ensure protection of the potable water. A testable backflow prevention
22.12 assembly shall be inspected after initial installation to ensure that it has been
22.13 properly installed and that debris resulting from the piping installation has not
22.14 interfered with the functioning of the assembly.

22.15 **603.5.23.3 Inspection and Records.** A test and inspection tag shall be affixed
22.16 to the testable backflow prevention assembly. The tester shall date and sign
22.17 the tag and include the tester's backflow prevention tester certification number.
22.18 Written records of testing and maintenance shall be maintained and submitted to
22.19 the administrative authority, and to the public water supplier, within 30 days of
22.20 testing if installed on a community public water system.

22.21 **603.5.23.4 Notification of Removal.** The Authority Having Jurisdiction, in
22.22 addition to the public water supplier, shall be notified within 30 days following
22.23 removal of a testable backflow prevention assembly from a community public
22.24 water system.

22.25 **4714.0604 MATERIALS.**

22.26 UPC section 604.11 is amended to read as follows:

24.1 separation of ten feet shall be maintained between the outer edge of the water supply
 24.2 pipe and the outer edge of the contamination source.

24.3 Subp. 2. Section 609. UPC section 609 is amended by adding the following
 24.4 subsection:

24.5 **609.11 Water Meters.** Water meters shall be located inside a building, installed at least
 24.6 12 inches above the finished floor, and readily accessible. All water meter installations
 24.7 shall be rigidly supported with a permanent support in order to prevent the meter from
 24.8 vibrating when the water is passing through it.

24.9 **Exceptions:** Where installation inside a building is not possible, the water meter may
 24.10 be installed in an enclosed structure not subject to flooding, high groundwater, or
 24.11 surface drainage runoff, provided the meter is protected from freezing. Provisions
 24.12 shall be made to install the meters above grade when possible. When installed below
 24.13 grade, the top of the structure shall be located at least 12 inches above the finished
 24.14 grade, be secured, and be accessible. This structure shall not be connected to any
 24.15 storm or sanitary sewer system.

24.16 **4714.0610 SIZE OF POTABLE WATER PIPING.**

24.17 UPC section 610, Table 610.3, is amended to read as follows:

24.18 **TABLE 610.3**

24.19 **Water Supply Fixture Units (WSFU) and Minimum Fixture Branch Pipe Sizes³**

24.20	<u>Appliances, Appurtenances, or Fixtures²</u>	<u>Minimum Fixture Branch Pipe Size^{1,4} (inches)</u>	<u>Private</u>	<u>Public</u>	<u>Assembly⁶</u>
24.21			<u>4.01.0</u>	<u>4.0</u>	<u>=</u>
24.24	<u>Bathtub or Combination</u>	<u>1/2</u>	<u>4.01.0</u>	<u>4.0</u>	<u>=</u>
24.25	<u>Bath/Shower (fill)</u>	<u>1/2</u>	<u>10.0</u>	<u>10.0</u>	<u>=</u>
24.26	<u>3/4-inch Bathtub Fill Valve</u>	<u>3/4</u>	<u>1.0</u>	<u>=</u>	<u>=</u>
24.27	<u>Bidet</u>	<u>1/2</u>	<u>4.0</u>	<u>4.0</u>	<u>=</u>
24.28	<u>Clothes Washer</u>	<u>1/2</u>	<u>4.0</u>	<u>4.0</u>	<u>=</u>

23.1 **604.11 Lead Content.** Water pipe and fittings with a lead content which exceeds a
23.2 weighted average of 0.25 percent in the wetted surface material, as established in the
23.3 Safe Drinking Water Act, section 1417(d), shall be prohibited in piping systems used
23.4 to convey potable water.

23.5 **4714.0608 WATER PRESSURE, PRESSURE REGULATORS, PRESSURE**
23.6 **RELIEF VALVES, AND VACUUM RELIEF VALVES.**

23.7 UPC section 608.5 is amended to read as follows:

23.8 **608.5 Drains.** Relief valves located inside a building shall be provided with: (1) a drain
23.9 that is not smaller than the relief valve outlet and piping and fittings made of galvanized
23.10 steel, hard-drawn copper, CPVC, or PP; or (2) a listed relief valve drain tube with fittings.
23.11 The drain and drain tube shall not reduce the internal bore of the pipe or tubing (straight
23.12 lengths as opposed to coils) and shall terminate to a safe place of disposal or within 18
23.13 inches of the floor.

23.14 Relief valve drains shall not terminate in a building's crawl space. No part of a drain
23.15 pipe shall be trapped or subject to freezing. The terminal end of the drain pipe shall
23.16 not be threaded.

23.17 **4714.0609 INSTALLATION, TESTING, UNIONS, AND LOCATION.**

23.18 Subpart 1. Section 609.6. UPC section 609.6 is amended to read as follows:

23.19 **609.6 Location.** Except as provided in Section 609.7, no building supply shall be located
23.20 in a lot other than the lot that is the site of the building or structure served by the building
23.21 supply.

23.22 **609.6.1 Water supply near sources of contamination.** Potable water supply pipes
23.23 shall not be located in, under, or above cesspools, septic tanks, septic tank drainage
23.24 fields, seepage pits, soil treatment systems, contaminated soil, sewer manholes,
23.25 catch basins, storm water storage tanks, buried tanks containing chemicals or
23.26 petroleum products, or any other source of contamination that in the judgment of the
23.27 administrative authority might contaminate the potable water supply. A horizontal

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25.1	<u>Dental Unit, cuspidor</u>	<u>1/2</u>	<u>=</u>	<u>1.0</u>	<u>=</u>
25.2	<u>Dishwasher, domestic</u>	<u>1/2</u>	<u>1.5</u>	<u>1.5</u>	<u>=</u>
25.3	<u>Drinking Fountain or Water</u>	<u>1/2</u>	<u>0.5</u>	<u>0.5</u>	<u>0.75</u>
25.4	<u>Cooler</u>				
25.5	<u>Hose Bibb</u>	<u>1/2</u>	<u>2.5</u>	<u>2.5</u>	<u>=</u>
25.6	<u>Hose Bibb, each additional⁸</u>	<u>1/2</u>	<u>1.0</u>	<u>1.0</u>	<u>=</u>
25.7	<u>Lavatory (each basin), or hand</u>				
25.8	<u>sink</u>	<u>1/2</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>
25.9	<u>Lawn sprinkler, each head⁵</u>	<u>=</u>	<u>1.0</u>	<u>1.0</u>	<u>=</u>
25.10	<u>Mobile Home, each (minimum)</u>	<u>=</u>	<u>12.0</u>	<u>=</u>	<u>=</u>
25.11	<u>Sinks</u>	<u>=</u>	<u>=</u>	<u>=</u>	<u>=</u>
25.12	<u>Bar</u>	<u>1/2</u>	<u>1.0</u>	<u>2.0</u>	<u>=</u>
25.13	<u>Clinic Faucet</u>	<u>1/2</u>	<u>=</u>	<u>3.0</u>	<u>=</u>
25.14	<u>Clinic Flushometer Valve with or</u>				
25.15	<u>without faucet</u>	<u>1</u>	<u>=</u>	<u>8.0</u>	<u>=</u>
25.16	<u>Kitchen, domestic with or</u>				
25.17	<u>without dishwasher</u>	<u>1/2</u>	<u>1.5</u>	<u>1.5</u>	<u>=</u>
25.18	<u>Laundry</u>	<u>1/2</u>	<u>1.5</u>	<u>1.5</u>	<u>=</u>
25.19	<u>Service or Mop Basin</u>	<u>1/2</u>	<u>1.5</u>	<u>3.0</u>	<u>=</u>
25.20	<u>Washup, each set of faucets</u>	<u>1/2</u>	<u>=</u>	<u>2.0</u>	<u>=</u>
25.21	<u>Shower, per head</u>	<u>1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>=</u>
25.22	<u>Urinal, 1.0 GPF Flushometer</u>				
25.23	<u>Valve</u>	<u>3/4</u>	<u>See Footnote⁷</u>		<u>=</u>
25.24	<u>Urinal, greater than 1.0 GPF</u>				
25.25	<u>Flushometer Valve</u>	<u>3/4</u>	<u>See Footnote⁷</u>		<u>=</u>
25.26	<u>Urinal, flush tank</u>	<u>1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>3.0</u>
25.27	<u>Wash Fountain, circular spray</u>	<u>3/4</u>	<u>=</u>	<u>4.0</u>	<u>=</u>
25.28	<u>Water Closet, 1.6 GPF Gravity</u>				
25.29	<u>Tank</u>	<u>1/2</u>	<u>2.5</u>	<u>2.5</u>	<u>3.5</u>
25.30	<u>Water Closet, 1.6 GPF</u>				
25.31	<u>Flushometer Tank</u>	<u>1/2</u>	<u>2.5</u>	<u>2.5</u>	<u>3.5</u>

→ indent

26.1	<u>Water Closet, 1.6 GPF</u>				
26.2	<u>Flushometer Valve</u>	<u>1</u>		<u>See Footnote⁷</u>	<u>=</u>
26.3	<u>Water Closet, greater than 1.6</u>				
26.4	<u>GPF Gravity Tank</u>	<u>1/2</u>	<u>3.0</u>	<u>5.5</u>	<u>7.0</u>
26.5	<u>Water Closet, greater than 1.6</u>				
26.6	<u>GPF Flushometer Valve</u>	<u>1</u>		<u>See Footnote⁷</u>	<u>=</u>

26.7 For SI units: 1 inch = 25 mm

26.8 **Notes:**

26.9 ¹ Size of the cold branch pipe, or both the hot and cold branch pipes.

26.10 ² Appliances, appurtenances, or fixtures not referenced in this table shall be permitted to be sized by reference to fixtures having a similar flow rate and frequency of use.

26.12 ³ The listed fixture unit values represent their load on the cold water building supply.

26.13 The separate cold water and hot water fixture unit value for fixtures having both hot and cold water connections shall be permitted to be each taken as three-quarters of the listed total value of the fixture.

26.16 ⁴ The listed minimum supply branch pipe sizes for individual fixtures are the nominal (I.D.) pipe size.

26.18 ⁵ For fixtures or supply connections likely to impose continuous flow demands, determine the required flow in gallons per minute (gpm) (L/s), and add it separately to the demand in gpm (L/s) for the distribution system or portions thereof.

26.21 ⁶ Assembly [Public Use]. See Minnesota Rules, chapter 1305, International Building Code.

26.22 ⁷ Where sizing flushometer systems, see Section 610.10.

26.23 ⁸ Reduced fixture unit loading for additional hose bibbs is to be used where sizing total building demand and for pipe sizing where more than one hose bibb is supplied by a segment of water distribution pipe. The fixture branch to each hose bibb shall be sized on the basis of 2.5 fixture units.

26.27 **4714.0611 WATER CONDITIONING EQUIPMENT.**

26.28 UPC sections 611.0 to 611.3 are amended to read as follows:

27.1 **611.0 Water Conditioning Equipment.**

27.2 **611.1 Application.** Water conditioning equipment shall comply with the requirements
27.3 in this section.

27.4 **611.1.1 Definition.** "Water conditioning equipment" means any appliance,
27.5 appurtenance, or fixture, or any combination thereof, designed to treat potable
27.6 water, so as to alter, modify, add, or remove any minerals, chemicals, or bacteria
27.7 contained in water. Water conditioning equipment includes but is not limited to
27.8 ion exchange water softeners, backwashing water filters, oxidizing water filters,
27.9 cartridge filters, chemical feed cartridges, ultraviolet lights, and equipment for reverse
27.10 osmosis, ultrafiltration, nanofiltration, pH adjustment, nitrate and arsenic removal,
27.11 and adsorption onto activated carbon.

27.12 **611.1.2 Manufacture and Assembly.** Water conditioning equipment shall: (1) be
27.13 manufactured as a complete system; or (2) be assembled as a complete system by a
27.14 licensed plumbing contractor or licensed water conditioning contractor, using various
27.15 types of water conditioning equipment. Wetted materials used in water conditioning
27.16 equipment shall comply with ANSI/NSF 61 standards, or the equipment shall comply
27.17 with the applicable NSF standards as listed in Table 1401.1.

27.18 **Exception:** Water conditioning equipment ^{that} ~~intended to treat~~ water for nonpotable
27.19 uses that are protected by an approved backflow device, assembly, or method as
27.20 required in Chapter 6 ^{as amended}

27.21 **611.1.3 Labeling.** All conditioning equipment shall be labeled by:
27.22 (1) the manufacturer of equipment manufactured as a complete system; or
27.23 (2) the licensed plumbing contractor or licensed water conditioning contractor who
27.24 assembled the complete system
27.25 so as to clearly identify the type of equipment and the name and address of the
27.26 manufacturer, licensed plumbing contractor, or licensed water conditioning contractor.

28.1 **611.2 Airgap Discharge.** Any discharge from water conditioning equipment shall enter
28.2 the drainage system through an airgap in accordance with Table 603.3.1 or an airgap
28.3 device in accordance with Table 603.2, NSF 58, or IAPMO PS 65.

28.4 **611.3 Connection Tubing.** The tubing to and from water conditioning units shall be of a
28.5 size and material as recommended by the manufacturer. The tubing shall comply with
28.6 the requirements of NSF 14, NSF 42, NSF 44, NSF 53, NSF 55, NSF 58, NSF 62, or the
28.7 appropriate material standards referenced in Table 1401.1.

28.8 **4714.0701 MATERIALS.**

28.9 UPC section 701.1 is amended to read as follows:

28.10 **701.1 Drainage Piping.** Materials for drainage piping shall be in accordance with one of
28.11 the referenced standards in Table 701.1 except that:

28.12 (1) Galvanized wrought-iron and galvanized steel pipe shall not be used underground and
28.13 shall be kept not less than 6 inches (152 mm) aboveground.

28.14 (2) ABS and PVC DWV piping installations shall be installed in accordance with
28.15 applicable standards referenced in Table 1401.1.

28.16 (3) No vitrified clay pipe or fittings shall be used aboveground or where pressurized by a
28.17 pump or ejector. They shall be kept not less than 12 inches (305 mm) belowground.

28.18 (4) Copper tube for drainage and pipe venting shall have a weight of not less than that of
28.19 copper drainage tube type DWV.

28.20 (5) Stainless steel 304 pipe and fittings shall not be installed underground and shall be kept
28.21 not less than 6 inches (152 mm) aboveground.

28.22 (6) Cast-iron soil pipe and fittings shall be listed and tested in accordance with standards
28.23 referenced in Table 1401.1. Such pipe and fittings shall be marked with country of
28.24 origin and identification of the original manufacturer in addition to markings required
28.25 by referenced standards.

28.26 UPC Table 701.1 is not amended.

29.1 4714.0702 FIXTURE UNIT EQUIVALENTS.29.2 UPC section 702, Table 702.1, is amended to read as follows:

29.3	<u>TABLE 702.1</u>				
29.4	<u>Drainage Fixture Unit Values (DFU)</u>				
29.5	<u>Minimum</u>				
29.6	<u>Size Trap</u>				
29.7	<u>and Trap</u>				
29.8	<u>Plumbing Appliances,</u>	<u>Arm⁶</u>			
29.9	<u>Appurtenances, or Fixtures</u>	<u>(inches)</u>	<u>Private</u>	<u>Public</u>	<u>Assembly⁷</u>
29.10	<u>Bathtub or Combination</u>				
29.11	<u>Bath/Shower</u>	<u>1-1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>=</u>
29.12	<u>Bidet</u>	<u>1-1/4</u>	<u>1.0</u>	<u>=</u>	<u>=</u>
29.13	<u>Bidet</u>	<u>1-1/2</u>	<u>2.0</u>	<u>=</u>	<u>=</u>
29.14	<u>Clothes Washer, Domestic,</u>				
29.15	<u>Standpipe²</u>	<u>2</u>	<u>3.0</u>	<u>3.0</u>	<u>3.0</u>
29.16	<u>Dental Unit, Cuspidor</u>	<u>1-1/4</u>	<u>=</u>	<u>1.0</u>	<u>1.0</u>
29.17	<u>Dishwasher, Domestic, with</u>				
29.18	<u>Independent Drain²</u>	<u>1-1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>
29.19	<u>Drinking Fountain or Water</u>				
29.20	<u>Cooler</u>	<u>1-1/4</u>	<u>0.5</u>	<u>0.5</u>	<u>1.0</u>
29.21	<u>Food Waste Grinder, Commercial</u>	<u>2</u>	<u>=</u>	<u>3.0</u>	<u>3.0</u>
29.22	<u>Floor Drain, Emergency</u>	<u>2</u>	<u>=</u>	<u>0.0</u>	<u>0.0</u>
29.23	<u>Floor Drain (for Additional Sizes</u>				
29.24	<u>see Section 702.0)</u>	<u>2</u>	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>
29.25	<u>Shower, Single-Head Trap</u>	<u>2</u>	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>
29.26	<u>Shower, Multi-Head, Each</u>				
29.27	<u>Additional</u>	<u>2</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>
29.28	<u>Lavatory, Single</u>	<u>1-1/4</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>
29.29	<u>Lavatory, in Sets of Two or Three</u>	<u>1-1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>
29.30	<u>Washfountain</u>	<u>1-1/2</u>	<u>=</u>	<u>2.0</u>	<u>2.0</u>
29.31	<u>Washfountain</u>	<u>2</u>	<u>=</u>	<u>3.0</u>	<u>3.0</u>
29.32	<u>Mobile Home, Trap</u>	<u>3</u>	<u>12.0</u>	<u>=</u>	<u>=</u>

30.1	<u>Receptor, Indirect Waste^{1,3}</u>	<u>1-1/2</u>		<u>See footnote^{1,3}</u>	
30.2	<u>Receptor, Indirect Waste^{1,4}</u>	<u>2</u>		<u>See footnote^{1,4}</u>	
30.3	<u>Receptor, Indirect Waste¹</u>	<u>3</u>		<u>See footnote¹</u>	
30.4	<u>Sinks</u>	<u>=</u>	<u>=</u>	<u>=</u>	<u>=</u>
30.5	<u>Bar</u>	<u>1-1/2</u>	<u>1.0</u>	<u>=</u>	<u>=</u>
30.6	<u>Bar²</u>	<u>1-1/2</u>	<u>=</u>	<u>2.0</u>	<u>2.0</u>
30.7	<u>Clinical</u>	<u>3</u>	<u>=</u>	<u>6.0</u>	<u>6.0</u>
30.8	<u>Commercial With Food Waste²</u>	<u>1-1/2</u>	<u>=</u>	<u>3.0</u>	<u>3.0</u>
30.9	<u>Commercial Pot or Scullery</u>	<u>2</u>	<u>=</u>	<u>4.0</u>	<u>4.0</u>
30.10	<u>Special Purpose²</u>	<u>1-1/2</u>	<u>2.0</u>	<u>3.0</u>	<u>3.0</u>
30.11	<u>Special Purpose</u>	<u>2</u>	<u>3.0</u>	<u>4.0</u>	<u>4.0</u>
30.12	<u>Special Purpose</u>	<u>3</u>	<u>=</u>	<u>6.0</u>	<u>6.0</u>
30.13	<u>Kitchen, Domestic² (with or</u>				
30.14	<u>without food waste grinder,</u>				
30.15	<u>dishwasher, or both)</u>	<u>1-1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>=</u>
30.16	<u>Laundry² (with or without</u>				
30.17	<u>discharge from a clothes washer)</u>	<u>1-1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>
30.18	<u>Service or Mop Basin</u>	<u>2</u>	<u>=</u>	<u>3.0</u>	<u>3.0</u>
30.19	<u>Service or Mop Basin</u>	<u>3</u>	<u>=</u>	<u>3.0</u>	<u>3.0</u>
30.20	<u>Service, Flushing Rim</u>	<u>3</u>	<u>=</u>	<u>6.0</u>	<u>6.0</u>
30.21	<u>Wash, Each Set of Faucets</u>	<u>=</u>	<u>=</u>	<u>2.0</u>	<u>2.0</u>
30.22	<u>Urinal, Integral Trap 1.0 GPF²</u>	<u>2</u>	<u>2.0</u>	<u>2.0</u>	<u>5.0</u>
30.23	<u>Urinal, Integral Trap Greater</u>				
30.24	<u>Than 1.0 GPF</u>	<u>2</u>	<u>2.0</u>	<u>2.0</u>	<u>6.0</u>
30.25	<u>Urinal, Exposed Trap²</u>	<u>1-1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>5.0</u>
30.26	<u>Water Closet, 1.6 GPF Gravity</u>				
30.27	<u>Tank</u>	<u>3</u>	<u>3.0</u>	<u>4.0</u>	<u>6.0</u>
30.28	<u>Water Closet, 1.6 GPF</u>				
30.29	<u>Flushometer Tank</u>	<u>3</u>	<u>3.0</u>	<u>4.0</u>	<u>6.0</u>
30.30	<u>Water Closet, 1.6 GPF</u>				
30.31	<u>Flushometer Valve</u>	<u>3</u>	<u>3.0</u>	<u>4.0</u>	<u>6.0</u>

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31.1	<u>Water Closet, Greater Than 1.6</u>				
31.2	<u>GPF Gravity Tank⁶</u>	<u>3</u>	<u>4.0</u>	<u>6.0</u>	<u>8.0</u>
31.3	<u>Water Closet, Greater Than 1.6</u>				
31.4	<u>GPF Flushometer Valve</u>	<u>3</u>	<u>4.0</u>	<u>6.0</u>	<u>8.0</u>

31.5 For SI units: 1 inch = 25 mm

31.6 **Notes:**

31.7 ¹ Indirect waste receptors shall be sized based on the total drainage capacity of the fixtures that drain therein to, in accordance with UPC Table 702.2(b).

31.9 ² Provide a 2-inch (50 mm) minimum drain.

31.10 ³ For refrigerators, coffee urns, water stations, and similar low demands.

31.11 ⁴ For commercial sinks, dishwashers, and similar moderate or heavy demands.

31.12 ⁵ Buildings having a clothes-washing area with clothes washers in a battery of three or more clothes washers shall be rated at 6-fixture units each for purposes of sizing common horizontal and vertical drainage piping.

31.15 ⁶ Trap sizes shall not be increased to the point where the fixture discharge is capable of being inadequate to maintain their self-scouring properties.

31.17 ⁷ Assembly [See Minnesota Rules, chapter 1305, International Building Code].

31.18 **4714.0704 FIXTURE CONNECTIONS (DRAINAGE).**

31.19 UPC section 704.3 is amended to read as follows:

31.20 **704.3 Commercial Dishwashing Machines and Sinks.** Pot sinks, scullery sinks, commercial kitchen sinks, beverage service sinks, dishwashing sinks, silverware sinks, commercial dishwashing machines, silverware-washing machines, and other similar fixtures shall be connected directly to the drainage system. A floor drain constructed

31.24 without backwater valves shall be provided adjacent to the fixture, and the fixture shall be

31.25 connected on the sewer side of the floor drain trap, and provided that no other drainage lines

31.26 connected between the floor drain waste connection and the fixture drain. The fixture and

31.27 floor drain shall be trapped and vented in accordance with this code.

32.1 **4714.0705 JOINTS AND CONNECTIONS.**

32.2 UPC subsection 705.10.2 is amended to read as follows:

32.3 **705.10.2 Expansion Joints.** Expansion joints shall be accessible and shall be
32.4 permitted to be used where necessary to provide for expansion and contraction
32.5 of the pipes.

32.6 **4714.0707 CLEANOUTS.**

32.7 UPC section 707.4 is amended by adding a new subsection:

32.8 **707.4.1 Back-to-Back.** A cleanout shall be provided on a common vertical
32.9 fixture drain or common vent serving two fixture traps that connect to a vertical
32.10 drain at the same level. The cleanout shall be the same nominal pipe size as the
32.11 drain serving the fixtures. Where the vertical drain is accessible through the trap
32.12 opening, the cleanout may be eliminated.

32.13 **4714.0710 DRAINAGE OF FIXTURES LOCATED BELOW THE NEXT**
32.14 **UPSTREAM MANHOLE OR BELOW THE MAIN SEWER LEVEL.**

32.15 Subpart 1. Section 710.12. UPC section 710.12 is amended to read as follows:

32.16 **710.12 Grinder Pump Ejector.** Grinder pumps shall be permitted to be used. The
32.17 sump basin storage volume and the pump capacity shall be sized adequately to prevent
32.18 overloading and shall at a minimum accommodate water demand peak flow from all
32.19 fixtures.

32.20 **710.12.1 Discharge Piping.** The discharge piping shall be sized in accordance with
32.21 the manufacturer's installation instructions and shall be not less than 1 1/4 inches (32
32.22 mm) in diameter. A check valve and fullway-type shutoff valve shall be located
32.23 within the discharge line.

32.24 Subp. 2. Section 710.13. UPC section 710.13 is amended to read as follows:

32.25 **710.13 Macerating Toilet Systems.** Listed macerating toilet systems shall be permitted

32.26 as an alternate to a sewage pump system. ~~A macerating toilet system may only be~~

33.1 ^{only} ~~installed~~ in one- or two-family dwellings when gravity flow is not possible. Not more
33.2 than one bathroom group, consisting of a toilet, a lavatory, and a shower or bathtub,
33.3 may discharge into a macerating toilet system. Components of macerating toilet systems
33.4 shall be accessible.

33.5 **710.13.1 Sumps.** The sump shall be watertight and gastight.

33.6 **710.13.2 Discharge Piping.** The discharge piping shall be sized in accordance
33.7 with the manufacturer's instructions and shall be not less than 3/4-inch (20 mm)
33.8 in diameter. The developed length of the discharge piping shall not exceed the
33.9 manufacturer's instructions. A check valve and fullway-type shutoff valve shall be
33.10 located within the discharge line or internally within the device.

33.11 **710.13.3 Venting.** The plumbing fixtures that discharge into the macerating device
33.12 shall be vented in accordance with this code. The sump shall be vented in accordance
33.13 with the manufacturer's instructions and the vent shall be permitted to connect to
33.14 the fixture venting.

33.15 **4714.0712 TESTING.**

33.16 Subpart 1. **Section 712.1.** UPC section 712.1 is amended to read as follows:

33.17 **712.1 Media.** The piping of the plumbing, drainage, and venting systems shall be tested
33.18 with water or air. The Authority Having Jurisdiction shall be permitted to require the
33.19 necessary points of access to ascertain whether the pressure has reached all parts of the
33.20 system.

33.21 Subp. 2. **Section 712.** UPC section 712 is amended by adding subsections to read
33.22 as follows:

33.23 **712.4 Negative Test.** Concrete manholes and sewer lines shall be tested by negative
33.24 pressure in accordance with ASTM Standards C1214-13 and C1244-11 or the Hydrostatic
33.25 Test Method in section 1109.2.2.

34.1 712.5 Finished Plumbing. After the plumbing fixtures have been set and their traps
 34.2 filled with water, their connections shall be tested and proven gastight and watertight by
 34.3 plugging the stack openings on the roof and the building drain where it leaves the building,
 34.4 and air introduced into the system equal to the pressure of a 1-inch water column. Such
 34.5 pressure shall remain constant for 15 minutes or the duration of the inspection without
 34.6 the introduction of additional air.

34.7 712.6 Test Plugs or Caps. Test plugs or caps for roof terminals shall extend above or
 34.8 outside the end of the vent pipe to provide a visible indication for removal after the test
 34.9 has been completed.

34.10 4714.0713 SEWER REQUIRED.

34.11 Subpart 1. Section 713.1. UPC section 713.1 is amended to read as follows:

34.12 713.1 Where Required. A building in which plumbing fixtures are installed and premises
 34.13 having drainage piping thereon shall have a connection to a public or private sewer, except
 34.14 as provided in sections 713.2 and 713.4 and Minnesota Rules, part 4714.0101, subpart 6.

34.15 Subp. 2. Section 713.5. UPC section 713.5 is deleted in its entirety.

34.16 Subp. 3. Section 713.7. UPC section 713.7 is amended to read as follows:

34.17 713.7 Installation. In cities, counties, or both where the installation of building sewers is
 34.18 under the jurisdiction of a municipal utility easement, the provisions of this code relating
 34.19 to building sewers do not apply.

Subp. 4. Section 713.8. A new section 713.8 is added to read as follows: 713.8

34.20 Exception: Single-family and two-family dwellings and buildings or structures
 34.21 accessory thereto, when connected to an approved private sewage disposal system
 34.22 prior to the time of connecting the premises to the public sewer need not connect to
 34.23 the public sewer when there is insufficient grade or slope to permit drainage to the
 34.24 public sewer by gravity and the following conditions are met:
 34.25 (1) no hazard, nuisance, or unsanitary condition is evidenced from the private sewage
 34.26 disposal system;

Single-family and two-family dwellings.

- 35.1 (2) the private sewage system is maintained properly; and
- 35.2 (3) written permission has been obtained from the Authority Having Jurisdiction.

35.3 **4714.0714 DAMAGE TO PUBLIC SEWER OR PRIVATE SEWAGE DISPOSAL**
 35.4 **SYSTEM.**

35.5 UPC section 714.5 is amended to read as follows:

35.6 **714.5 Tanks.** An approved-typed, watertight sewage or wastewater holding tank, the
 35.7 contents of which, due to their character, shall be periodically removed and disposed of at
 35.8 some approved off-site location, shall be installed where required by the Authority Having
 35.9 Jurisdiction to prevent anticipated surface or subsurface contamination or pollution,
 35.10 damage to the public sewer, or other hazardous or nuisance conditions.

35.11 **4714.0715 BUILDING SEWER MATERIALS.**

35.12 UPC section 715.3 is amended to read as follows:

35.13 **715.3 Existing Sewers.** Replacement of existing building sewer and building storm
 35.14 sewers using cured-in-place pipe lining trenchless methodology and materials shall be
 35.15 installed in accordance with ASTM F 1216. Replacement using cured-in-place pipe liners
 35.16 shall not be used on collapsed piping or when the existing piping is compromised to a point
 35.17 where the installation of the liners will not eliminate hazardous or insanitary conditions.

35.18 **4714.0717 SIZE OF BUILDING SEWERS.**

35.19 UPC section 717, Table 717.1, is amended to read as follows:

35.20 **TABLE 717.1**

35.21 **Maximum/Minimum Fixture Unit Loading on Building Sewer Piping**

35.22 **SLOPE (inches per foot)**

35.23 <u>Size of Pipe (inches)</u>	<u>1/16</u>	<u>1/8</u>	<u>1/4</u>
35.24 <u>6 and smaller</u>	<u>(As specified in Table 703.2/No minimum loading)</u>		
35.25 <u>8</u>	<u>1950/1500</u>	<u>2800/625</u>	<u>3900/275</u>
35.26 <u>10</u>	<u>3400/1600</u>	<u>4900/675</u>	<u>6800/300</u>
35.27 <u>12</u>	<u>5600/1700</u>	<u>8000/725</u>	<u>11 200/352</u>

36.1 For SI units: 1 inch = 25 mm, 1 inch per foot = 83.3 mm/m

36.2 **4714.0721 LOCATION.**

36.3 UPC Table 721.1 is amended to read as follows:

36.4 **TABLE 721.1**

36.5 **Minimum Horizontal Distance Required from Building Sewer (feet)**

36.6 Water supply wells See M.R. Chapter 4725¹

36.7 Building supply 10²

36.8 For SI units: 1 foot = 304.8 mm

36.9 **Notes:**

36.10 ¹ The minimum horizontal setback distance between a building sewer and a water supply well is governed by Minnesota Rules, chapter 4725.

36.12 ² Unless otherwise permitted by the Administrative Authority and when installed in accordance with Section 720.0.

36.14 **4714.0722 ABANDONED SEWERS AND SEWAGE DISPOSAL FACILITIES.**

36.15 UPC sections 722.0 to 722.5 are deleted in their entirety.

36.16 **4714.0723 BUILDING SEWER TEST.**

36.17 UPC section 723.1 is amended to read as follows:

36.18 **723.1 General.** Building sewers shall be tested by plugging the end of the building sewer
36.19 at its points of connection with the public sewer or private sewage disposal system and
36.20 completely filling the building sewer with water from the lowest to the highest point
36.21 thereof, or by approved equivalent low-pressure air test. Testing of building sewers shall

36.22 be in accordance with Section 712. The building sewer shall be gastight or watertight.
Ø, as amended

36.23 **4714.0724 RECREATIONAL VEHICLE SANITARY DISPOSAL STATION.**

36.24 UPC chapter 7 is amended by adding the following sections:

36.25 **724.0 Recreational Vehicle Sanitary Disposal Station.**

37.1 **724.1 Construction.** Each recreational vehicle sanitary disposal (dump) station shall have
37.2 a concrete slab with the drainage system located as to be on the road (left) side of the
37.3 recreational vehicle. The slab shall be not less than 3 feet by 3 feet (914 mm by 914 mm),
37.4 not less than 3-1/2 inches (89 mm) thick, and properly reinforced. The slab surface shall
37.5 be troweled to a smooth finish and sloped from each side inward to a drainage system inlet.

37.6 The drainage system inlet shall consist of a 4-inch (102 mm), self-closing,
37.7 foot-operated hatch of materials meeting these rules with the cover milled to fit tight. The
37.8 hatch body shall be set in the concrete of the slab with the lip of the opening flush with
37.9 its surface to facilitate the cleansing of the slab with water. The hatch shall be properly
37.10 connected to a drainage system inlet, which shall discharge to a public or private sewer
37.11 meeting the standards of this section.

37.12 **724.2 Flushing Device.** The recreational vehicle sanitary disposal station flushing device
37.13 shall consist of a supported riser terminating not less than 2 feet (610 mm) above the
37.14 ground surface, with a 3/4-inch (20 mm) valved outlet adaptable for a flexible hose. The
37.15 flexible hose shall be designed such that it cannot lie on the ground. The water supply to
37.16 the flushing device shall be protected from backflow by means of a listed vacuum breaker
37.17 or backflow prevention device located downstream from the last shutoff valve.

37.18 Adjacent to the recreational vehicle sanitary disposal station shall be posted a sign of
37.19 durable material not less than 2 feet by 2 feet (610 mm by 610 mm) in size. Inscribed on
37.20 the sign in clearly legible letters shall be the following:

37.21 "DANGER - NOT TO BE USED FOR DRINKING OR DOMESTIC PURPOSES."

37.22 **4714.0801 INDIRECT WASTES.**

37.23 Subpart 1. Section 801.2.2. UPC section 801.2.2 is amended to read as follows:
37.24 **801.2.2 Walk-In Coolers.** Floor drains shall not be located inside walk-in coolers
37.25 unless they are specifically required by the licensing authority. Where required,
37.26 floor drains shall be connected to a separate drainage line discharging into an
37.27 outside receptor. The flood-level rim of the receptor shall not be less than 6 inches

38.1 (152 mm) lower than the lowest floor drain. The floor drains shall be trapped and
 38.2 individually vented. Cleanouts shall be provided at 90 degree (1.57 rad) turns and
 38.3 shall be accessibly located. The waste shall discharge through an air gap or air break
 38.4 into a trapped and vented receptor, except that a full-size air gap is required where
 38.5 the indirect waste pipe is under vacuum.

38.6 Subp. 2. Section 801.2.3. UPC section 801.2.3 is amended to read as follows:

38.7 **801.2.3 Food-Handling Fixtures.** Cooking ranges, steam kettles, potato peelers,
 38.8 ice cream dipper wells, and similar equipment shall be indirectly connected to the
 38.9 drainage system by means of an air gap. Bins, cooling counters, compartments, and
 38.10 other equipment having drainage connections and used for the storage of unpackaged
 38.11 ice used for human ingestion, or used in direct contact with ready-to-eat food, shall be
 38.12 indirectly connected to the drainage system by means of an air gap. Each indirect waste
 38.13 pipe from food-handling fixtures, storage or holding compartments, or equipment shall
 38.14 be separately trapped and piped to the indirect waste receptor and shall not combine
 38.15 with other indirect waste pipes. The piping from the equipment to the receptor shall
 38.16 be not less than the drain on the unit, and in no case less than 3/4 inch (20 mm).

38.17 Subp. 3. Section 801.3. UPC section 801.3 is deleted in its entirety.

38.18 **4714.0804 INDIRECT WASTE RECEPTORS.**

38.19 UPC section 804 is amended by adding the following subsection:

38.20 **804.2 Domestic or Culinary Type Fixtures Prohibited as Receptors.** No plumbing
 38.21 fixture that is used for domestic or culinary purposes shall be used to receive the discharge
 38.22 of an indirect waste. ^{Exception:} Domestic use dishwashers may discharge into a sink, or discharge to
 38.23 a sink tailpiece or food-waste grinder when installed in accordance with Section 807.4.

38.24 **4714.0813 SWIMMING POOLS.**

38.25 UPC section 813.1 is amended to read as follows:

39.1 **813.1 General.** Pipes carrying wastewater from swimming or wading pools, including pool
39.2 drainage and backwash from filters, ~~including~~ water from scum gutter drains and pool deck
39.3 drains, shall be installed as an indirect waste. Where a pump is used to discharge waste pool
39.4 water to the drainage system, the pump discharge shall be installed as an indirect waste.

39.5 **4714.0814 CONDENSATE WASTES AND CONTROL.**

39.6 Subpart 1. **Section 814.1.** UPC section 814.1 is amended to read as follows:

39.7 **814.1 Condensate Disposal.** Condensate from air washers, air-cooling coils, fuel-burning
39.8 condensing appliances, the overflow from evaporative coolers, and similar water-supplied
39.9 equipment or similar air-conditioning equipment shall be collected and discharged to an
39.10 approved plumbing fixture or disposal area. Where discharged into the drainage system,
39.11 equipment shall drain by means of an indirect waste pipe. The waste pipe shall have a
39.12 slope of not less than 1/8 inch per ~~square~~ foot (10.4 mm/m) or 1 percent slope and shall be
39.13 made of an approved corrosion-resistant material.

39.14 Subp. 2. **Table 814.1.** UPC Table 814.1 is deleted.

39.15 Subp. 3. **Section 814.2.** UPC section 814.2 is deleted in its entirety.

39.16 Subp. 4. **Section 814.3.** UPC section 814.3 is amended to read as follows:

39.17 **814.3 Point of Discharge.** Air-conditioning condensate waste pipes shall connect
39.18 indirectly to the interior drainage system through an air gap or air break to: (1) properly
39.19 trapped and vented receptors; (2) the tailpiece of an approved plumbing fixture; or (3) an
39.20 exterior place of disposal approved by the Minnesota Pollution Control Agency.

39.21 Condensate waste shall not drain over a public way or in areas causing a nuisance.

39.22 **4714.0902 VENTS NOT REQUIRED.**

39.23 UPC section 902.2 is deleted in its entirety.

39.24 **4714.0903 MATERIALS.**

39.25 UPC section 903.1 is amended to read as follows:

40.1 **903.1 Applicable Standards.** Vent pipes and fittings shall comply with the applicable
40.2 standards referenced in Table 701.1, except that:

40.3 (1) Galvanized steel or 304 stainless steel pipe shall not be installed underground and shall
40.4 be not less than 6 inches (152 mm) aboveground.

40.5 (2) ABS and PVC DWV piping installations shall be in accordance with the applicable
40.6 standards referenced in Table 1401.1.

40.7 **4714.0905 VENT PIPE GRADES AND CONNECTIONS.**

40.8 UPC section 905.3 is amended to read as follows:

40.9 **905.3 Vent Pipe Rise.** Except as provided elsewhere in this code, each vent shall rise
40.10 vertically to a point not less than 6 inches (152 mm) above the flood-level rim of the fixture
40.11 served before offsetting horizontally, and where two or more vent pipes converge, each
40.12 such vent pipe shall rise to a point not less than 6 inches (152 mm) in height above the
40.13 flood-level rim of the plumbing fixture it serves before being connected to any other vent.

40.14 **4714.0906 VENT TERMINATION.**

40.15 Subpart 1. Section 906.1. UPC section 906.1 is amended to read as follows:

40.16 **906.1 Roof Termination.** Each vent pipe or stack shall extend through its flashing and
40.17 shall terminate vertically not less than 12 inches (305 mm) above the roof.

40.18 Subp. 2. Section 906.3. UPC section 906.3 is amended to read as follows:

40.19 **906.3 Use of Roof.** Vent pipes shall be extended separately or combined and of full
40.20 required size, not less than 12 inches (305 mm) above the roof. Flagpoling of vents shall
40.21 be prohibited except where the roof is used for purposes other than weather protection.
40.22 Vents within 10 feet (3,048 mm) of a part of the roof that is used for such other purposes
40.23 shall extend not less than 7 feet (2,134 mm) above the roof and shall be securely stayed.

40.24 Subp. 3. Section 906.7. UPC section 906.7 is amended to read as follows:

40.25 **906.7 Frost or Snow Closure.** Vent terminals shall be not less than 2 inches (50 mm) in
40.26 diameter and shall not be smaller than the required vent pipe. Any change in diameter

41.1 shall be made inside the building not less than 12 inches (305 mm) below the roof in an
41.2 insulated space and terminate not less than 12 inches (305 mm) above the roof.

41.3 **4714.1001 TRAPS REQUIRED.**

41.4 UPC section 1001.1 is amended to read as follows:

41.5 **1001.1 Where Required.** Each plumbing fixture shall be separately trapped by an
41.6 approved type of liquid seal trap. This section shall not apply to fixtures with integral
41.7 traps. Not more than one trap shall be permitted on a trap arm. Food waste disposal units
41.8 installed with a set of restaurant, commercial, or industrial sinks shall be connected to
41.9 a separate trap. Each domestic clothes washer and each laundry tub shall be connected
41.10 to a separate and independent trap, except that a laundry tub shall be permitted to also
41.11 receive the waste from a clothes washer set adjacent thereto. The vertical distance
41.12 between a fixture outlet and the trap weir shall be as short as practicable, but in no case
41.13 shall the tailpiece from a fixture exceed 24 inches (610 mm) in length. One trap shall be
41.14 permitted to serve a set of not more than three single compartment sinks or laundry tubs
41.15 of the same depth or three lavatories immediately adjacent to each other and in the same
41.16 room where the waste outlets are not more than 30 inches (762 mm) apart and the trap is
41.17 centrally located where the three compartments are installed.

41.18 **4714.1007 TRAP SEAL PROTECTION.**

41.19 UPC section 1007 is deleted in its entirety.

41.20 **4714.1008 BUILDING TRAPS.**

41.21 UPC section 1008 is deleted in its entirety.

41.22 **4714.1009 INDUSTRIAL INTERCEPTORS (CLARIFIERS) AND SEPARATORS.**

41.23 UPC section 1009.2 is amended to read as follows:

41.24 **1009.2 Approval.** The size, type, and location of each interceptor (clarifier) or separator
41.25 shall meet the requirements of this chapter.

42.1 Exception: Interceptors or separators that are engineered and manufactured and are
42.2 documented by the manufacturer and the project registered professional engineer
42.3 to be properly designed and sized for the specific project, and are approved by the
42.4 Authority Having Jurisdiction.

42.5 No wastes other than those requiring treatment or separation shall be discharged into an
42.6 interceptor (clarifier) or separator unless specifically permitted elsewhere in this code.

42.7 **4714.1010 SLAUGHTERHOUSES, PACKING ESTABLISHMENTS, ETC.**

42.8 UPC section 1010.1 is amended to read as follows:

42.9 **1010.1 Slaughterhouses.** Slaughtering and dressing room drains shall be equipped with
42.10 separators or interceptors approved by the administrative authority, which shall prevent
42.11 the discharge into the drainage system of feathers, entrails, or other material likely to
42.12 clog the drainage system.

42.13 **4714.1014 GREASE INTERCEPTORS.**

42.14 UPC section 1014.3.7 is amended to read as follows:

42.15 **1014.3.7 Abandoned Gravity Grease Interceptors.** Abandoned gravity grease
42.16 interceptors shall be pumped and filled as required by the Authority Having
42.17 Jurisdiction.

42.18 **4714.1101 GENERAL.**

42.19 Subpart 1. Section 1101.1. UPC section 1101.1 is amended to read as follows:

42.20 **1101.1 Where Required.** Roofs, paved areas, yards, courts, courtyards, vent shafts, light
42.21 wells, or similar areas having rainwater, shall be drained into a separate storm sewer system
42.22 or into a combined sewer system where a separate storm sewer system is not available, or
42.23 to some other place of disposal satisfactory to the Authority Having Jurisdiction. In the
42.24 case of one- and two-family dwellings, storm water shall be permitted to be discharged on
42.25 flat areas, such as lawns, so long as the storm water shall flow away from the building and

43.1 away from adjoining property and shall not create a nuisance. In no case shall water from
 43.2 roofs or any building roof drainage ~~be allowed~~ to flow ^{onto} ~~upon~~ the public sidewalk. *a building owner or designer knowingly or intentionally allow*

43.3 Subp. 2. Section 1101.2. UPC section 1101.2 is amended to read as follows:

43.4 1101.2 Storm Water Drainage to Sanitary Sewer Prohibited. Storm water shall not be
 43.5 drained into sewers intended for sanitary drainage unless approved by the municipal sewer
 43.6 authority or stated elsewhere in this code.

43.7 Subp. 3. Section 1101.3. UPC section 1101.3 is amended to read as follows:

43.8 1101.3 Material Uses. Rainwater piping placed within the interior of a building or run
 43.9 within a vent or shaft shall be of cast-iron, galvanized steel, wrought iron, brass, copper,
 43.10 lead, Schedule 40 ABS DWV, Schedule 40 PVC DWV, stainless steel 304 or 316L
 43.11 [stainless steel 304 pipe and fittings shall not be installed underground and shall be kept
 43.12 not less than 6 inches (152 mm) aboveground], or other approved materials. Changes
 43.13 in direction shall be in accordance with Section 706.0. ABS and PVC DWV piping
 43.14 installations shall be installed in accordance with IS 5 and IS 9.

43.15 Subp. 4. Section 1101.11. UPC section 1101.11 is amended to read as follows:

43.16 1101.11 Roof Drainage.

43.17 1101.11.1 Primary Roof Drainage. When roof areas of a building are drained
 43.18 by roof drains, the location and sizing of the drains shall be coordinated with the
 43.19 structural design and pitch of the roof in accordance with section 1106 or as permitted
 43.20 elsewhere in this code. The roof drainage system shall be sized on a basis of a rate of
 43.21 rainfall of at minimum 4 inches per hour.

43.22 1101.11.2 Secondary Drainage. Secondary (emergency) roof drainage shall be
 43.23 provided in accordance with Minnesota Rules, chapter 1305.

43.24 UPC Table 1101.11 is not amended.

44.1 Subp. 5. Sections 1101.11.2.1, 1101.11.2.2, 1101.2.2 (A), and 1101.11.2.2 (B).
44.2 UPC subsections 1101.11.2.1, 1101.11.2.2, 1101.11.2.2 (A), and 1101.11.2.2 (B) are
44.3 deleted in their entirety.

44.4 **4714.1106 SIZE OF LEADERS, CONDUCTORS, AND STORM DRAINS.**

44.5 UPC section 1106.3 is amended to read as follows:

44.6 **1106.3 Reduction in Size Prohibited.** Except for siphonic roof drainage systems, storm
44.7 drain piping shall not reduce in size in the direction of flow, including changes in direction
44.8 from horizontal to vertical.

44.9 **4714.1108 CONTROLLED-FLOW ROOF DRAINAGE.**

44.10 UPC section 1108.1 is amended to read as follows:

44.11 **1108.1 Application.** The controlled-flow roof drainage system shall be sized on the basis
44.12 of controlled flow and storage of the storm water on the roof, provided the design is based
44.13 on a minimum of 4 inches per hour and the following conditions are met:

44.14 (1) The water from a 25-year-frequency storm shall not be stored on the roof for more
44.15 than 24 hours.

44.16 (2) During the storm, the water depth on the roof shall not exceed the depths specified
44.17 in Table 1108.1 (2).

44.18 (3) Not less than two drains shall be installed in roof areas of 10,000 square feet (929 m²)
44.19 or less, and not less than one additional drain shall be installed for each additional 10,000
44.20 square feet (929 m²) or less of roof area.

44.21 (4) Each roof drain shall have a precalibrated, fixed (nonadjustable), and proportional
44.22 weir (notched) in a standing water collar inside the strainer. No mechanical devices or
44.23 valves shall be allowed.

44.24 (5) Pipe sizing shall be based on the precalibrated rate of flow (gpm) (L/s) of the
44.25 precalibrated weir for the maximum allowable water depth, and Tables 1101.7 and 1101.11.

- 45.1 (6) The height of stones or other granular material above the waterproofed surface shall
 45.2 not be considered in water depth measurement, and the roof surface in the vicinity of the
 45.3 drain shall not be recessed to create a reservoir.
- 45.4 (7) Roof design, where controlled-flow roof drainage is used, shall be such that the design
 45.5 roof live load is not less than 40 lb/ft².
- 45.6 (8) Scuppers shall be provided in parapet walls. The distance of scupper bottoms above the
 45.7 roof level at the drains shall not exceed the maximum distances specified in Table 1108.1(8).
- 45.8 (9) Scupper openings shall be not less than 4 inches (102 mm) high and have a width equal
 45.9 to the circumference of the roof drain required for the area served, sized in accordance
 45.10 with Table 1101.11.
- 45.11 (10) Flashings shall extend above the top of the scuppers.
- 45.12 (11) At a wall or parapet, 45-degree (0.79 rad) cants shall be installed.
- 45.13 (12) Separate storm and sanitary drainage systems shall be provided within the building.
- 45.14 (13) Calculations for the roof drainage system shall be submitted, along with the plans, to
 45.15 the Authority Having Jurisdiction for approval.

45.16 UPC Table 1108.1(2) and Table 1108.1(8) are not amended.

45.17 **4714.1109 TESTING.**

45.18 Subpart 1. **Section 1109.1.** UPC section 1109.1 is amended to read as follows:

45.19 **1109.1 Testing Required.** ~~New~~^B building storm drainage systems ^{that are new} and parts of existing
 45.20 systems that have been altered, extended, or repaired shall be tested in accordance with
 45.21 section 712 to disclose leaks and defects, except as provided in section 1109.2. Any
 45.22 section of the building storm sewer that passes through contaminated soils or contaminated
 45.23 water must be air tested in accordance with section 712.3.

45.24 Subp. 2. **Section 1109.2.** UPC section 1109.2 is amended to read as follows:

45.25 **1109.2 Exceptions.**

45.26 **1109.2.1** Testing is not required for:

46.1 (1) outside leaders;
46.2 (2) perforated or open drain tile; or
46.3 (3) portions of storm drainage system and sewers that are located more than ten feet
46.4 from buildings, more than ten feet from buried water lines, and more than 50 feet from
46.5 water wells, and that do not pass through soil or water identified as being contaminated.
46.6 1109.2.2 Building storm sewers shall be tested in accordance with section 712 or the
46.7 Hydrostatic Test Method from the City Engineers Association of Minnesota. The
46.8 Hydrostatic Test Method, provisions E2 and E3, as specified in Standard Utilities
46.9 Specifications for Watermain and Service Line Installation and Sanitary Sewer and
46.10 Storm Sewer Installation, written and published by the City Engineers Association
46.11 of Minnesota, 2013 edition, is incorporated by reference, is not subject to frequent
46.12 change, and is available in the office of the commissioner of labor and industry.

46.13 **4714.1110 SIPHONIC ROOF DRAINAGE SYSTEM.**

46.14 UPC chapter 11 is amended by adding a new section and subsections as follows:

46.15 **1110.0 Siphonic Roof Drainage System.**

46.16 **1110.1 General Requirements.** Siphonic roof drainage systems shall be designed as an
46.17 engineered siphonic roof drainage system when allowed by the administrative authority.

46.18 The engineered siphonic roof drainage system shall meet the requirements of Sections
46.19 1110.2 and 1110.3.

46.20 **1110.2 Design Criteria.** The siphonic roof drainage system shall be designed and certified
46.21 by a registered professional engineer.

46.22 **1110.2.1 Sizing.** The system shall be sized on the basis of a minimum rate of rainfall
46.23 of 4 inches per hour.

46.24 **1110.2.2 Design.** The drainage system shall be designed according to ASPE Standard
46.25 45, Siphonic Roof Drainage, and according to the manufacturer's recommendations
46.26 and requirements. Manufacturer design software shall be in accordance with ASPE
46.27 Standard 45.

- 47.1 **1110.2.3 Roof drain bodies.** Roof drains shall meet ASME A112.6.9, Siphonic
47.2 Roof Drains.
- 47.3 **1110.2.4 Water accumulation.** When designed for water accumulation, the roof shall
47.4 be designed for the maximum possible water accumulation according to Section
47.5 1108.1 (7), as amended in this code, and Minnesota Rules, chapter 1305.
- 47.6 **1110.2.5 Pipe size and cleanouts.** Minimum pipe size shall be 1-1/2 inches. All pipe
47.7 sizes and cleanouts in the drainage system shall be designed and installed according
47.8 to ASPE Standard 45.
- 47.9 **1110.2.6 Horizontal pipes.** Horizontal pipe size shall not reduce in the direction of
47.10 flow.
- 47.11 **1110.2.7 Plans and specifications.** The plans and specifications for the drainage
47.12 system shall indicate the siphonic roof drainage system as an engineered method
47.13 used for the design.
- 47.14 **1110.2.8 Markings.** The installed drainage system shall be permanently and
47.15 continuously marked as a siphonic roof drainage system at approved intervals and
47.16 clearly at points where piping passes through walls and floors. Roof drains shall be
47.17 marked in accordance with ASME A112.6.9.
- 47.18 **1110.2.9 Transition locations.** The transition locations from the siphonic roof
47.19 drainage system to a gravity system shall be determined by the registered professional
47.20 engineer at a location approved by the administrative authority. The design, sizing,
47.21 and venting of the transition location shall be in accordance with ASPE Standard 45.
47.22 The velocity at the transition location to gravity shall be reduced to less than three
47.23 feet per second. The gravity portion of the building storm sewer system receiving the
47.24 siphonic roof drainage system shall be sized for the design rate but not less than a
47.25 rainfall rate of 4 inches per hour and in accordance with Section 1106.0.
- 47.26 **1110.2.10 Required submissions.** All plans, specifications, and calculations shall
47.27 be signed and sealed by the registered professional engineer and submitted to the

48.1 administrative authority. The submitted calculations shall include performance
 48.2 data for the drainage system for the required rainfall rate, including the minimum
 48.3 and maximum calculated operating pressures and velocities verifying that the
 48.4 design solution is within the operating parameters required by the design standard.
 48.5 All performance data shall be reported as the extreme maximum and minimum
 48.6 calculations and shall not be presented as averaged data.

48.7 **1110.3 Proof of Suitability.** Upon completion of the project: proper tests, inspections,
 48.8 and certification of the siphonic roof drainage system shall be performed according
 48.9 to items 1110.3.1 and 1110.3.2:

48.10 **1110.3.1 Testing.** Testing shall be performed according to ASPE Standard 45.

48.11 **1110.3.2 Written certification.** Prior to the final plumbing inspection, the registered
 48.12 professional engineer shall provide written certification to the administrative authority
 48.13 that the system has been visually inspected by the registered professional engineer or
 48.14 the registered professional engineer's designee and the installation has been properly
 48.15 implemented according to the certified design, plans, calculations, and specifications.
 48.16 The submitted written certification shall include any field modification from the
 48.17 initial design involving dimensions, location, or routing of the siphonic roof drainage
 48.18 system that shall be reapproved and recertified by the registered professional engineer
 48.19 and be accompanied by a final as-built design of the altered system and supported
 48.20 by calculated data to show that the overall system remains in accordance with ASPE
 48.21 Standard 45.

48.22 **4714.1401 REFERENCED STANDARDS.**

48.23 Table 1401.1 is amended to add the following:

48.24 ASPE Standard 45, Siphonic Roof Drainage, and applies to roof drainage referenced
 48.25 in sections 1110.2.5, 1110.2.9, 1110.3.1, and 1110.3.2.

48.26 ASTM Standards C1214-13 referenced in section 712.4.

48.27 ASTM Standards C1244-11 referenced in section 712.4.

*IAPMO IBC 155, Pipeless Whirlpool Bathtub Appliances
 referenced in section 409.1.*

49.1 Standard Utilities Specifications for water main and service line installation and
49.2 sanitary sewer and storm sewer installation referenced in section 1109.2.2.

49.3 **4714.1701 GENERAL.**

49.4 UPC section 1701.1 is amended to read as follows:

49.5 **1701.1 Applicability.** The provisions of this chapter shall apply to the installation,
49.6 construction, alteration, and repair of rainwater catchment systems for nonpotable
49.7 applications listed in Section 1702.1.

49.8 **1701.1.1 Irrigation.** Rainwater catchment systems used for lawn irrigation are not
49.9 covered under this chapter.

49.10 **1701.1.2 Combination Systems.** Rainwater catchment systems used for lawn
49.11 irrigation in combination with any uses listed in Section 1702.1 shall meet the
49.12 requirements of this chapter. The irrigation system shall be separated by an air gap or
49.13 proper backflow protection as required for potable water.

49.14 **4714.1702 NONPOTABLE RAINWATER CATCHMENT SYSTEMS.**

49.15 Subpart 1. Section 1702.1. UPC section 1702.1 is amended to read as follows:

49.16 **1702.1 General.** The installation, construction, alteration, and repair of rainwater
49.17 catchment systems intended to supply uses such as water closets, urinals, trap primers for
49.18 floor drains and floor sinks, industrial processes, water features, vehicle washing facilities,
49.19 cooling tower makeup, and similar uses shall be approved by the commissioner.

49.20 Subp. 2. Section 1702.2. UPC section 1702.2 is amended to read as follows:

49.21 **1702.2 Plumbing Plan Submission.** No permit for a rainwater catchment system shall
49.22 be issued until complete plumbing plans have been submitted and approved by the
49.23 commissioner in accordance with Minnesota Rules, part 1300.0215, subpart 6.

49.24 Subp. 3. Section 1702.4. UPC section 1702.4 is amended to read as follows:

49.25 **1702.4 Connections to Potable or Reclaimed (Recycled) Water Systems.** Rainwater
49.26 catchment systems shall have no direct connection to a potable water supply or alternate

50.1 water source system. Potable or reclaimed (recycled) water is permitted to be used
50.2 as makeup water for a rainwater catchment system provided the potable or reclaimed
50.3 (recycled) water supply connection is protected by an air gap or reduced-pressure principle
50.4 backflow preventer in accordance with this code. An automatic means to supply the
50.5 rainwater catchment system with makeup water shall be installed when there is insufficient
50.6 rainwater to meet the required demand or due to system failure.

50.7 Subp. 4. **Section 1702.5.** UPC section 1702.5 is amended to read as follows:
50.8 **1702.5 Initial Cross-Connection Test.** Where a portion of a rainwater catchment system
50.9 is installed within a building, a cross-connection test is required in accordance with
50.10 Section 1702.11.2. Before the building is occupied or the system is activated, the plumbing
50.11 contractor shall perform the initial cross-connection test in the presence of the Authority
50.12 Having Jurisdiction. The test shall be ruled successful before final approval is granted.

50.13 Subp. 5. **Section 1702.7.** UPC section 1702.7 is amended to read as follows:
50.14 **1702.7 Rainwater Catchment System Materials.** Rainwater catchment system materials
50.15 shall comply with Sections 1702.7.1 through 1702.7.4.

50.16 **1702.7.1 Water Supply and Distribution Materials.** Rainwater catchment water
50.17 supply and distribution materials shall comply with Chapter 6, as amended in this
50.18 code, and the requirements of this code for potable water supply and distribution
50.19 systems, unless otherwise provided for in this section.

50.20 **1702.7.2 Rainwater Catchment System Drainage Materials.** Materials used in
50.21 rainwater catchment drainage systems, including gutters, downspouts, conductors,
50.22 and leaders shall be in accordance with Chapter 11, as amended in this code, and the
50.23 requirements of this code for storm drainage.

50.24 **1702.7.3 Storage Tanks.** Rainwater storage tanks shall comply with Section
50.25 1702.9.5, as amended in this code.

50.26 **1702.7.4 Collection Surfaces.** The collection surface shall be constructed of a hard,
50.27 impervious material.

51.1 Subp. 6. Section 1702.9. UPC section 1702.9.3 is amended to read as follows:

51.2 1702.9.3 Collection Surfaces. Rainwater catchment systems shall collect rainwater
51.3 only from roof surfaces. Rainwater catchment systems shall not collect rainwater from:

51.4 (1) vehicular parking surfaces;

51.5 (2) surface water runoff;

51.6 (3) bodies of standing water; or

51.7 (4) similar nonroof surfaces.

51.8 1702.9.3.1 Prohibited Discharges. Overflows and bleed-off pipes from roof-mounted
51.9 equipment and appliances, condensate, and other waste disposal shall not discharge

51.10 onto roof surfaces that ~~are intended~~ for rainwater catchment systems.

collect rainwater

51.11 Subp. 7. Section 1702.9. UPC section 1702.9.4 is amended to read as follows:

51.12 1702.9.4 Minimum Water Quality. The minimum water quality for rainwater
51.13 catchment systems shall meet the applicable water quality recommendations in Table
51.14 1702.9.4.

51.15 Subp. 8. Section 1702.9.4. UPC section 1702.9.4 is amended by adding the
51.16 following table:

TABLE 1702.9.4

<u>Measure</u>	<u>Limit</u>
51.18 <u>Turbidity (NTU)</u>	<u><1</u>
51.19 <u>E. coli (MPN/100 mL)</u>	<u>2.2</u>
51.20 <u>Odor</u>	<u>Non-offensive</u>
51.21 <u>Temperature (degrees Celsius)</u>	<u>MR</u>
51.22 <u>Color</u>	<u>MR</u>
51.23 <u>pH</u>	<u>MR</u>

51.24 MR = measured and recorded only

51.25 Treatment:

51.26 Minimum 5 micron absolute filter

52.1 Minimum .5-log inactivation of viruses

52.2 Subp. 9. Section 1702.9.5. UPC section 1702.9.5 is amended to read as follows:

52.3 1702.9.5.1 Construction. Rainwater storage shall be constructed of solid,
52.4 durable materials not subject to excessive corrosion or decay, watertight, and
52.5 suitable for rainwater storage.

52.6 Subp. 10. Section 1702.9.5. UPC section 1702.9.5.6 (A) is amended to read as
52.7 follows:

52.8 1702.9.5.6 (A) Animals and Insects. Rainwater tank openings shall be protected
52.9 to prevent the entrance of insects, birds, or rodents into the tank and piping
52.10 system. Screen installed on vent pipes, inlets, and overflow pipes shall be
52.11 corrosion-resistant and have an aperture of not greater than 1/16 inch (1.6 mm)
52.12 and shall be close-fitting.

by adding a new subsection

52.13 Subp. 11. Section 1702.9.5. UPC section 1702.9.5.8 is amended to read as follows:

52.14 1702.9.5.8 Storage Tank Venting. A vent shall be installed on each tank. The
52.15 vent shall extend from the top of the tank and terminate a minimum of 12
52.16 inches above grade, shall be a minimum of 1-1/2 inches in diameter, and shall
52.17 be turned downward.

52.18 Subp. 12. Section 1702.9.6. UPC section 1702.9.6 is amended to read as follows:

52.19 1702.9.6 Pumps. Pumps serving rainwater catchment systems shall be listed.
52.20 Pumps supplying water to water closets, urinals, and trap primers shall be capable
52.21 of delivering not less than 15 pounds-force per square inch (psi) (103 kPa) residual
52.22 pressure at the highest and most remote outlet served. Where the water pressure in
52.23 the rainwater supply system within the building exceeds 80 psi (552 kPa), a listed
52.24 pressure-reducing valve reducing the pressure to 80 psi (552 kPa) or less to water
52.25 outlets in the building shall be installed in accordance with this code.

52.26 Subp. 13. Section 1702.9.7. UPC section 1702.9.7 is amended to read as follows:

53.1 1702.9.7 Roof Drains. Primary and secondary roof drain systems shall be designed
53.2 and installed in accordance with Chapter 11, as amended in this code. Secondary roof
53.3 drains shall be equipped with a working alarm.

53.4 Subp. 14. Section 1702.9.8. UPC section 1702.9.8 is amended to read as follows:
53.5 1702.9.8 Water Quality Devices and Equipment. The rainwater catchment system
53.6 shall include filtration and disinfection to maintain the minimum water quality
53.7 requirements in Table 1702.9.4. At a minimum, a 5-micron absolute filter shall be
53.8 provided along with disinfection to provide a 0.5-log inactivation of viruses. Devices
53.9 and equipment used to treat rainwater shall be suitable for rainwater catchment
53.10 system applications, properly designed, sized, and documented for the specific project
53.11 by a Minnesota registered professional engineer.

53.12 Subp. 15. Sections 1702.9.11 and 1702.9.12. UPC sections 1702.9.11 and 1702.9.12
53.13 are deleted in their entirety.

53.14 Subp. 16. Section 1702.10. UPC section 1702.10.1 is amended to read as follows:
53.15 1702.10.1 Commercial, Industrial, and Institutional Restroom Signs. A sign shall
53.16 be installed in restrooms in commercial, industrial, and institutional occupancies
53.17 using nonpotable rainwater for water closets, urinals, or both. Each sign shall contain
53.18 1/2-inch (12.7 mm) letters of a highly visible color on a contrasting background. The
53.19 location of the sign(s) shall be such that the sign(s) shall be visible to users. Each sign
53.20 shall contain one of the following texts as determined by the application:

53.21 1702.10.1 (A) TO CONSERVE WATER, THIS BUILDING USES RAINWATER
53.22 TO FLUSH TOILETS AND URINALS.

53.23 1702.10.1 (B) TO CONSERVE WATER, THIS BUILDING USES RAINWATER
53.24 TO FLUSH TOILETS.

53.25 1702.10.1 (C) TO CONSERVE WATER, THIS BUILDING USES RAINWATER
53.26 TO FLUSH URINALS.

54.1 1702.10.1 (D) TO CONSERVE WATER, THIS BUILDING USES RAINWATER
 54.2 TO * *
 54.3 * * shall indicate the rainwater usage.

54.4 Subp. 17. Section 1702.11. UPC section 1702.11.2 is amended to read as follows:
 54.5 1702.11.2 Cross-Connection Inspection and Testing. An initial and subsequent
 54.6 annual inspection and test in accordance with Section 1702.5 shall be performed
 54.7 on both the potable water system and rainwater catchment water systems. The
 54.8 potable and rainwater catchment water systems shall be isolated from each other
 54.9 and independently inspected and tested to ensure there is no cross-connection in
 54.10 accordance with Sections 1702.11.2.1 through 1702.11.2.4.

54.11 1702.11.2.1 Visual System Inspection. Prior to commencing the
 54.12 cross-connection testing and annually thereafter, a dual system inspection shall
 54.13 be conducted as follows:

54.14 Pumps, equipment, equipment room signs, and exposed piping in an equipment
 54.15 room shall be inspected for visible cross-connections, proper operation, and
 54.16 damage.

54.17 1702.11.2.2 Cross-Connection Test. The following procedure shall be followed
 54.18 by the plumbing contractor in the presence of the Authority Having Jurisdiction
 54.19 to determine whether a cross-connection has occurred:

54.20 (1) The potable water system shall be activated and pressurized. The rainwater
 54.21 catchment water system shall be shut down and completely drained.

54.22 (2) The potable water system shall remain pressurized while the rainwater
 54.23 catchment water system is completely drained. The minimum period the
 54.24 rainwater catchment water system is to remain completely drained shall be
 54.25 determined based on the size and complexity of the potable water system and
 54.26 rainwater catchment water distribution system, but in no case shall that period
 54.27 be less than one hour.

- 55.1 (3) Fixtures, potable water, and rainwater, shall be tested and inspected
55.2 for flow. Flow from a rainwater catchment water system outlet indicates
55.3 a cross-connection. No flow from a potable water outlet indicates that it is
55.4 connected to the rainwater catchment water system.
- 55.5 (4) The drain on the rainwater catchment water system shall be checked for flow
55.6 during the test and at the end of the testing period.
- 55.7 (5) The potable water system shall then be completely drained.
- 55.8 (6) The rainwater catchment water system shall then be activated and pressurized.
- 55.9 (7) The rainwater catchment water system shall remain pressurized for a
55.10 minimum time specified by the Authority Having Jurisdiction while the potable
55.11 water system is completely drained. The minimum period the potable water
55.12 system is to remain completely drained shall be based on the size and complexity
55.13 of the potable water system and rainwater catchment water distribution system
55.14 but in no case shall that period be less than one hour.
- 55.15 (8) Fixtures, potable and rainwater catchment, shall be tested and inspected for
55.16 flow. Flow from a potable water system outlet indicates a cross-connection.
55.17 No flow from a rainwater catchment water outlet indicates that it is connected
55.18 to the potable water system.
- 55.19 (9) The drain on the potable water system shall be checked for flow during the
55.20 test and at the end of the testing period.
- 55.21 (10) Where there is no flow detected in the fixtures that would indicate a
55.22 cross-connection, the potable water system shall be repressurized.
- 55.23 **1702.11.2.3 Discovery of Cross-Connection.** In the event that a cross-connection
55.24 is discovered, the following procedure, in the presence of the Authority Having
55.25 Jurisdiction, shall be activated immediately:
- 55.26 (1) Rainwater catchment water piping to the building shall be shut down at the
55.27 meter and the rainwater water riser shall be drained.

- 56.1 (2) Potable water piping to the building shall be shut down at the meter.
- 56.2 (3) The cross-connection shall be uncovered and disconnected.
- 56.3 (4) The building shall be retested following procedures listed in Sections
- 56.4 1702.11.2.1 and 1702.11.2.2.
- 56.5 (5) The potable water system shall be chlorinated with 50 ppm chlorine for 24
- 56.6 hours.
- 56.7 (6) The potable water system shall be flushed after 24 hours, and a standard
- 56.8 bacteriological test shall be performed. Where test results are acceptable, the
- 56.9 potable water system shall be permitted to be recharged.
- 56.10 **1702.11.2.4 Inspection.** An annual inspection of the rainwater catchment water
- 56.11 system, following the procedures in Section 1702.11.2.1, shall be required.
- 56.12 Cross-connection testing, following the procedures listed in Section 1702.11.2.2,
- 56.13 shall be required every five years.
- 56.14 Alternate testing requirements shall be permitted by the Authority Having
- 56.15 Jurisdiction.
- 56.16 Subp. 18. **Section 1702.** UPC section 1702 is amended by adding the following
- 56.17 section:
- 56.18 **1702.12 Maintenance and Inspection.** Rainwater catchment water systems and
- 56.19 components shall be inspected and maintained in accordance with Sections 1702.12.1
- 56.20 through 1702.12.3.
- 56.21 **1702.12.1 Frequency.** Rainwater catchment systems and components shall be
- 56.22 inspected and maintained in accordance with Table 1702.12 unless more frequent
- 56.23 inspection and maintenance is required by the manufacturer.
- 56.24 **1702.12.2 Maintenance Log.** A maintenance log for rainwater catchment systems is
- 56.25 required. The property owner or designated appointee shall ensure that a record of
- 56.26 testing, inspection, and maintenance in accordance with Table 1702.12 is maintained

57.1 in the log. The log shall indicate the frequency of inspection and maintenance for
57.2 each system.

57.3 **1702.12.3 Maintenance Responsibility.** The required operation, maintenance,
57.4 monitoring, testing, and inspection of rainwater catchment systems shall be the
57.5 responsibility of the property owner.

57.6 Subp. 19. Section 1702.12. UPC section 1702.12 is amended by adding the
57.7 following table:

57.8 **TABLE 1702.12**

57.9 **Minimum Alternate Water Source Testing, Inspection, and Maintenance Frequency**

<u>Description</u>	<u>Minimum Frequency</u>
57.11 <u>Inspect and clean filters and screens, and replace.</u>	<u>Every three months.</u>
57.12 <u>Inspect and verify that required disinfection, filters,</u>	<u>After initial installation and</u>
57.13 <u>and water quality treatment devices and systems are</u>	<u>monthly thereafter.</u>
57.14 <u>operational and maintaining minimum water quality</u>	<u>Exception: Every 12 months</u>
57.15 <u>requirements in Table 1702.9.4.</u>	<u>thereafter when electronically</u>
57.16	<u>monitored.</u>
57.17 <u>Inspect and clear debris from rainwater gutters,</u>	<u>At the beginning of seasonal</u>
57.18 <u>downspouts, and roof washers.</u>	<u>usage and monthly during</u>
57.19	<u>seasonal usage.</u>
57.20 <u>Inspect and clear debris from roof or other aboveground</u>	<u>At the beginning of seasonal</u>
57.21 <u>rainwater collection surfaces.</u>	<u>usage and monthly during</u>
57.22	<u>seasonal usage.</u>
57.23 <u>Remove tree branches and vegetation overhanging roof</u>	<u>As needed.</u>
57.24 <u>or other aboveground rainwater collection surfaces.</u>	
57.25 <u>Inspect pumps and verify operation.</u>	<u>After initial installation and every</u>
57.26	<u>12 months thereafter.</u>
57.27 <u>Inspect valves and verify operation.</u>	<u>After initial installation and every</u>
57.28	<u>12 months thereafter.</u>
57.29 <u>Inspect pressure tanks and verify operation.</u>	<u>After initial installation and every</u>
57.30	<u>12 months thereafter.</u>

- 58.1 Clear debris from and inspect storage tanks and After initial installation and every
 58.2 locking devices and verify operation. 12 months thereafter.
- 58.3 Inspect caution labels and marking. After initial installation and every
 58.4 12 months thereafter.
- 58.5 Cross-connection inspection and test.* After initial installation and
 58.6 thereafter in accordance with
 58.7 Section 1702.11.2.4.

58.8 *The cross-connection test shall be performed in accordance with this chapter by a plumber
 58.9 licensed under Minnesota Statutes, section 326B.46, and certified to ASSE Standard 5120.

58.10 Subp. 20. **Section 1702.** UPC section 1702 is amended by adding a section as follows:

58.11 **1702.13 Operation and Maintenance Manual.** An operation and maintenance manual
 58.12 for rainwater systems shall be supplied to the building owner by the system designer. The
 58.13 operating and maintenance manual shall include the following:

- 58.14 (1) Detailed diagram of the entire system and the location of system components.
- 58.15 (2) Instructions on operating and maintaining the system.
- 58.16 (3) Details on maintaining the required water quality in Table 1702.9.4.
- 58.17 (4) Details on deactivating the system for maintenance, repair, or other purposes.
- 58.18 (5) Applicable testing, inspection, and maintenance frequencies in accordance with Table
 58.19 1702.12.
- 58.20 (6) A method of contacting the manufacturer(s).

58.21 Subp. 21. **Section 1702.** UPC section 1702 is amended by adding the following
 58.22 section:

58.23 **1702.14 Separation Requirements.** All underground rainwater service piping shall be
 58.24 separated from the building sewer, in accordance with Section 609.2. Treated, nonpotable
 58.25 water pipes shall be permitted to be run or laid in the same trench as potable water pipes
 58.26 with a 12-inch minimum vertical and horizontal separation when both pipe materials are
 58.27 approved for use within a building. Where horizontal piping materials do not meet this

59.1 requirement, the minimum separation shall be increased to 60 inches. The potable water
 59.2 pipng shall be installed at an elevation above the treated-nonpotable water piping.

59.3 Subp. 22. Section 1702. UPC section 1702 is amended by adding the following
 59.4 section:

59.5 **1702.15 Abandonment.** All rainwater catchment systems that are no longer in use and
 59.6 fail to be maintained in accordance with Section 1702.12 shall be considered abandoned.
 59.7 Abandoned rainwater catchment systems are subject to Sections 1702.15.1 and 1702.15.2.

59.8 **1702.15.1 General.** Every abandoned system or part thereof covered under the scope
 59.9 of this chapter, as amended in this code, shall be disconnected from any remaining
 59.10 systems, drained, plugged, and capped per the requirements of this code.

59.11 **1702.15.2 Underground Tank.** Every underground water storage tank that has

59.12 been abandoned or otherwise discontinued from use in a system covered under the
 59.13 scope of this chapter, as amended in this code, shall be completely drained and
 59.14 filled with earth, sand, gravel, or concrete or removed in a manner approved by the
 59.15 administrative authority.

59.16 **REPEALER.** Minnesota Rules, parts 4715.0100; 4715.0200; 4715.0300; 4715.0310;
 59.17 4715.0320; 4715.0330; 4715.0340; 4715.0400; 4715.0410; 4715.0420; 4715.0500;
 59.18 4715.0510; 4715.0520; 4715.0530; 4715.0540; 4715.0550; 4715.0560; 4715.0570;
 59.19 4715.0580; 4715.0590; 4715.0600; 4715.0610; 4715.0620; 4715.0630; 4715.0640;
 59.20 4715.0700; 4715.0710; 4715.0720; 4715.0730; 4715.0740; 4715.0750; 4715.0760;
 59.21 4715.0770; 4715.0780; 4715.0790; 4715.0800, subparts 1, 2, 4, 5, 6, 6a, and 7; 4715.0805;
 59.22 4715.0810; 4715.0815; 4715.0820; 4715.0830; 4715.0840; 4715.0850; 4715.0860;
 59.23 4715.0870; 4715.0880; 4715.0890; 4715.0900; 4715.0910; 4715.0920; 4715.0930;
 59.24 4715.0940; 4715.0950; 4715.0960; 4715.0970; 4715.1000; 4715.1010; 4715.1020;
 59.25 4715.1030; 4715.1100; 4715.1105; 4715.1120; 4715.1130; 4715.1140; 4715.1150;
 59.26 4715.1160; 4715.1200; 4715.1210; 4715.1220; 4715.1230; 4715.1240; 4715.1250;
 59.27 4715.1260; 4715.1300, subparts 1, 2, 3, 4, and 6; 4715.1305; 4715.1310; 4715.1320;

- 60.1 4715.1330; 4715.1340; 4715.1350; 4715.1360; 4715.1370; 4715.1380; 4715.1390;
60.2 4715.1400; 4715.1410; 4715.1420; 4715.1430; 4715.1440; 4715.1500; 4715.1510;
60.3 4715.1520; 4715.1530; 4715.1540; 4715.1550; 4715.1560; 4715.1570; 4715.1580;
60.4 4715.1590, subparts 1, 2, 3, and 4; 4715.1600; 4715.1610; 4715.1700; 4715.1710;
60.5 4715.1720; 4715.1730; 4715.1740; 4715.1750; 4715.1760; 4715.1770; 4715.1800;
60.6 4715.1810; 4715.1900; 4715.1910; 4715.1911; 4715.1912; 4715.1920; 4715.1940;
60.7 4715.1941; 4715.1950; 4715.1960; 4715.2000; 4715.2010; 4715.2020; 4715.2030;
60.8 4715.2100; 4715.2110; 4715.2120; 4715.2150; 4715.2160; 4715.2161; 4715.2162;
60.9 4715.2163; 4715.2165; 4715.2170; 4715.2180; 4715.2190; 4715.2200; 4715.2210;
60.10 4715.2215; 4715.2220; 4715.2230; 4715.2240; 4715.2250; 4715.2280; 4715.2300;
60.11 4715.2310; 4715.2320; 4715.2330; 4715.2340; 4715.2350; 4715.2360; 4715.2370;
60.12 4715.2400; 4715.2410; 4715.2420; 4715.2430; 4715.2440; 4715.2450; 4715.2500;
60.13 4715.2510; 4715.2520; 4715.2530; 4715.2540; 4715.2550; 4715.2560; 4715.2570;
60.14 4715.2580; 4715.2600; 4715.2610; 4715.2620; 4715.2630; 4715.2640; 4715.2650;
60.15 4715.2655; 4715.2660; 4715.2700; 4715.2710; 4715.2720; 4715.2730; 4715.2740;
60.16 4715.2750; 4715.2760; 4715.2770; 4715.2780; 4715.2790; 4715.2820; 4715.2840;
60.17 4715.2850; 4715.2860; 4715.2870; 4715.3500; 4715.3600; 4715.3700; 4715.3800,
60.18 subparts 1, 2, 3, 4, 5, 6, 7, 8, 9, 10a, and 11a; 4715.4100; 4715.5000; 4715.5100;
60.19 4715.5200; 4715.5300; 4715.5400; 4715.5500; and 4715.5700, are repealed.

Minnesota Plumbing Board

STATEMENT OF NEED AND REASONABLENESS

Proposed Amendment to Rules Governing Minnesota Plumbing Code, Minnesota Rules, chapter 4714, and Repeal of Minnesota Rules, chapter 4715; Revisor's ID Number R-04139

INTRODUCTION

Regulatory authority to prescribe minimum plumbing standards was established in 1940 and granted to the State Board of Health.¹ In 1975, the word “regulation” was changed to “rule.”² In 2007, the rulemaking authority was transferred to the then newly-established Minnesota Plumbing Board (“Board”).³ The Board consists of 14 members.⁴

The Minnesota Plumbing Code (“Plumbing Code”) is part of the State Building Code.⁵ Although the Plumbing Code is adopted by the Board, it is administered and enforced by the Minnesota Department of Labor and Industry (“Department”). The Board proposes to repeal the current Plumbing Code in chapter 4715 and replace it with a new Plumbing Code in chapter 4714.

The current Plumbing Code is a homegrown code that was developed over time. The Board proposes to incorporate the 2012 Uniform Plumbing Code by reference, with amendments, to replace the existing Plumbing Code. The Board formed an advisory committee, the Plumbing Board National Code Review Committee (“Review Committee”), at the April 2010 Board meeting to review and make a recommendation to the full Board as to whether to pursue a national code adoption and if so, which one. Based on request for action forms received, the Review Committee considered the International Plumbing Code (“IPC”) and the Uniform Plumbing Code (“UPC”). Representatives of the IPC and the UPC presented to the whole Board at the April 2011 meeting. A motion to adopt a national code was passed with the statutorily required two-thirds majority vote at the April 2011 meeting.⁶ Another motion to adopt the UPC with amendments was passed with the statutorily required two-thirds majority vote at the April 2011 meeting as well.⁷ The Review Committee met thirteen times from February 2011 to September 2013 and followed the open meeting laws. The Review Committee proposed specific UPC amendments to the Board; the Board discussed each amendment and took informal votes to compile a proposed rule draft. These proposed rules developed from the first draft after thorough discussions that included Board members and other interested parties. The Board, pursuant to statute and Board bylaws, approved

¹ See 5887-19, page 1084 at [www.revisor.mn.gov/data/revisor/statute/1940A/1940A-035.pdf#search="5887-19](http://www.revisor.mn.gov/data/revisor/statute/1940A/1940A-035.pdf#search=).

² See (as Minnesota Statute, section 326.37) 1975 c 136 s 66 at www.revisor.mn.gov/data/revisor/law/1975/0/1975-136.pdf

³ See (as Minnesota Statute, section 326.37) 2007 c 135 art 3 s 19, 20 at www.revisor.mn.gov/laws/?doctype=Chapter&year=2007&type=0&id=140

⁴ A list of current Board members is available at www.dli.mn.gov/PDF/pb/members.pdf

⁵ See [Minnesota Rules, part 1300.0050](#)

⁶ See meeting minutes at www.dli.mn.gov/PDF/pb/minutes0411.pdf and statutory requirement at www.revisor.mn.gov/statutes/?id=326B.435 (note that only 13 of the 14 members are voting members.

⁷ Id.

the proposed rules by an affirmative two-thirds or more majority vote of all the voting members of the Board.⁸

ALTERNATIVE FORMAT

Upon request, this information can be made available in an alternative format, such as large print, braille, or audio. To make a request, contact Suzanne Todnem at Minnesota Department of Labor and Industry, 443 Lafayette Road North, 651.284.5006, fax at 651.284.5725 or dli.rules@state.mn.us.

STATUTORY AUTHORITY

The Board's statutory authority to adopt the proposed rules is stated in the following Minnesota Statutes:

326B.43, Subdivision 1. **Rules.** The Plumbing Board may, by rule, prescribe minimum standards which shall be uniform and which shall be effective for all new plumbing installations performed anywhere in the state, including additions, extensions, alterations, and replacements.

326B.435, Subd. 2. **Powers; duties; administrative support.**

(a) The board shall have the power to... (3) adopt the Plumbing Code that must be followed in this state and any Plumbing Code amendments thereto. The Plumbing Code shall include the minimum standards described in sections [326B.43, subdivision 1](#), and [326B.52, subdivision 1](#). The board shall adopt the Plumbing Code and any amendments thereto pursuant to chapter 14 and as provided in subdivision 6, paragraphs (b), (c), and (d)."

This rulemaking repeals and replaces existing rules for which the Legislature has not newly revised the statutory authority; therefore, time limits in Minnesota Statutes, section 14.125, do not apply. The proposed rules do not affect farming operations so no copy of the proposed rules was provided to the commissioner of agriculture.⁹ The proposed rules do not have their primary effect on Chicano/Latino people so a copy was not submitted to the State Council on Affairs of Chicano/Latino People for review.¹⁰

Under these statutes, the Board has the necessary statutory authority to adopt the proposed rules.

REGULATORY ANALYSIS

⁸ [Minnesota Statutes, section 326B.435](#), subdivision 6(c).

⁹ See Minn. Stat. § 14.111.

¹⁰ See Minn. Stat. § 3.9223

Minnesota Statutes, section 14.131, sets out eight factors for a regulatory analysis that must be included in the SONAR. Paragraphs (1) through (8) below quote these factors and then give the Board's response.¹¹

(1) a description of the classes of persons who probably will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule

The proposed rules will likely affect plumbing contractors, journeymen, apprentices, master plumbers, restricted master plumbers, restricted journeymen, plumber's apprentices, employers of person who perform plumbing work, persons who wish to perform plumbing work, plumbing inspectors, building officials, engineers, persons in the water conditioning industry, residential and commercial building contractors and owners, and the general public.

(2) the probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues

The Board adopts the Plumbing Code but does not administer or enforce it; therefore, the Board will not incur any costs associated with the adoption of the proposed rules.

Costs to the Department include the costs of purchasing code books for state employees who address Plumbing Code questions. Adoption of the proposed rules will not affect state revenues because it is a self-funded program through collection of fees.

(3) a determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the proposed rule

The purpose of the proposed rules is to promote the public health and safety through properly designed, acceptably installed, and adequately maintained plumbing systems.¹² No other less costly or less intrusive methods would establish minimum plumbing standards and adequately maintain plumbing systems. In this case, the proposed rule adopts a model code.

(4) a description of any alternative methods for achieving the purpose of the proposed rule that were seriously considered by the agency and the reasons why they were rejected in favor of the proposed rule

The Board seriously considered three options: 1) update the existing Minnesota Plumbing Code; 2) adopt the International Plumbing Code ("IPC"), with amendments; and 3) adopt the Uniform Plumbing Code, with amendments.¹³ The Board rejected the first option because the existing Code is outdated; updating it would be as time-consuming as adopting a model code but would not yield the benefits of adopting a model code. The second option was rejected because the Board wished to adopt a model code, the UPC most closely resembles the existing Minnesota Plumbing Code, and the UPC is adopted in three of the four states adjacent to Minnesota, two of which have reciprocity agreements with Minnesota, providing consistency.¹⁴ Therefore, adopting the UPC presents an easier transition from the existing code than the IPC would.

¹¹ Because the paragraphs quote the statute, note that "agency" means the Board in this document.

¹² [Minnesota Statutes, section 326B.41](#).

¹³ The Board received two Requests For Actions ("RFA") in regard to considered incorporating by reference a model code; one RFA asking the Board to consider the International Plumbing Code and one RFA for consideration of the Uniform Plumbing Code.

¹⁴ Minnesota has plumbing license reciprocity agreements with North Dakota and South Dakota. The UPC is adopted

(5) the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals

Plumbers, municipal inspection departments and designers will need to purchase copies of the UPC. Training curriculum will need to be updated to incorporate any changes in the code.

Costs to new home or commercial buildings or other plumbing to which the code applies is anticipated to be neutral. Some changes might result in higher expenses than the existing rule requirements but other code changes will result in cost savings. For example, the proposed rules allow more products to be used without additional local approval, resulting in more available options than the existing code.

Costs to retrain to the new code are not anticipated to be significantly different from the existing code because training is already required under the existing code.

(6) the probable costs or consequences of not adopting the proposed rule, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals

The existing code is already outdated so not adopting the proposed rules would result in a Plumbing Code that is further outdated. Other costs or consequences include eliminating new technologies from the pool of available products and method. These costs and consequences would ultimately fall to the building owner.

(7) an assessment of any differences between the proposed rule and existing federal regulations and a specific analysis of the need for and reasonableness of each difference

There are no applicable federal regulations that address Plumbing Code issues in the construction of non-federally owned buildings.

(8) an assessment of the cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule. . . . ‘[C]umulative effect’ means the impact that results from incremental impact of the proposed rule in addition to other rules, regardless of what state or federal agency has adopted the other rules. Cumulative effects can result from individually minor but collectively significant rules adopted over a period of time.

There are no other state or federal regulations related to the specific purpose of the proposed rules.

PERFORMANCE-BASED RULES

The Plumbing Code is performance-based in that it balances the method with the end result of the plumbing work within a framework of standards. The proposed rules are performance-based standards to the extent practicable.

ADDITIONAL NOTICE

This Additional Notice Plan was reviewed by the Office of Administrative Hearings and approved in a [date] letter by Administrative Law Judge [name].

This Notice Plan also includes giving notice required by statute. We will mail the Notice of Intent to Adopt to everyone who has registered to be on the Department’s rulemaking mailing list under Minnesota Statutes, section 14.14, subdivision 1a. We will also give notice to the Legislature per Minnesota Statutes, section 14.116.

In addition to the rulemaking lists required by statute, the Board will be mailing or emailing the Notice of Intent to Adopt to organizations and trade associations anticipated to be substantially affected by the proposed rules. Those organizations and associations are as follows:

1. American Backflow Prevention Association (ABPA) – Region 10
2. American Society of Plumbing Engineers (ASPE) – Minnesota Chapter
3. American Society of Civil Engineers – Minnesota Section
4. American Council of Engineering Companies of Minnesota
5. American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) – Minnesota Chapter
6. Associated Builders and Contractors
7. Association of General Contractors of Minnesota
8. Association of Minnesota Building Officials (AMBO)
9. Association of Minnesota Counties
10. Building Owners and Managers Association (BOMA)/Duluth
11. Building Owners and Managers Association (BOMA)/Minneapolis
12. Building Owners and Managers Association (BOMA)/St. Paul
13. Builders Association of Minnesota (BAM)
14. Builders Association of the Twin Cities

15. League of Minnesota Cities
16. Metropolitan Council
17. Minnesota Association of Plumbing and Mechanical Officials
18. Minnesota Association of Townships
19. Minnesota Mechanical Contractors Association
20. Minnesota Pipe Trades Association
21. Minnesota Plumbing, Heating and Cooling Contractors Association
22. Minnesota Rural Water Association
23. Minnesota State Fire Chiefs Association
24. Minnesota State Fire Marshal Division
25. Minnesota Water Quality Association (MWQA)
26. U. S. Green Building Council – Minnesota Chapter
27. United Association of Plumbers and Gasfitters Local Union #15
28. Water Quality Association (WQA)

This Notice Plan does not include notifying the Commissioner of Agriculture because the proposed rules do not affect farming operations per Minnesota Statutes, section 14.111.

This Notice Plan does not include notifying the state Council on Affairs of Chicano/Latino People per Minnesota Statutes, section 3.9223 because the proposed rules will not have their primary effect on Chicano/Latino people.

CONSULTATION WITH MMB ON LOCAL GOVERNMENT IMPACT

As required by Minnesota Statutes, section 14.131, the Department consulted with Minnesota Management and Budget (MMB). We did this by sending MMB copies of the documents that we send to the Governor’s Office for review and approval. The documents included: the Governor’s Office Proposed Rule and SONAR Form; the near-final proposed rules; and the near-final SONAR. MMB Executive Budget Officer Elisabeth Hammer responded, in part, as follows in a letter dated **DATE**: “Based upon **DATE**

The Department will submit a copy of the cover correspondence and the response received from Minnesota Management and Budget to OAH at the hearing or with the documents it submits for ALJ review.

DETERMINATION ABOUT RULES REQUIRING LOCAL IMPLEMENTATION

As required by Minnesota Statutes, section 14.128, subdivision 1, the agency has considered whether these proposed rules will require a local government to adopt or amend any ordinance or other regulation in order to comply with these rules. The Board has the rulemaking authority in this case and therefore has made the required determination. The Board has determined that the only required amendment to a local ordinance that the Board is aware of would be a change in any specific references from chapter 4715 to chapter 4714.

COST OF COMPLYING FOR SMALL BUSINESS OR CITY

Agency Determination of Cost

As required by Minnesota Statutes, section 14.127, the Board has considered whether the cost of complying with the proposed rules in the first year after the rules take effect will exceed \$25,000 for any small business or small city. A small business is defined as a business (either for profit or nonprofit) with less than 50 full-time employees and a small city is defined as a city with less than ten full-time employees. The Board has determined that the cost of complying with the proposed rules in the first year after the rules take effect will not exceed \$25,000 for any small business or small city.

LIST OF WITNESSES

If the proposed rules go to a public hearing, the Department anticipates having the following witnesses testify in support of the need for and reasonableness of the rules:

1. Mr. Jim Peterson, Construction Codes and Licensing Section Chief, Plumbing Plan Review and Inspections, Department of Labor and Industry, will testify about the technical information about the Plumbing Code and the background of the proposed amendments.
2. Ms. Cathy Tran, P.E., Public Health Engineer, Department of Labor and Industry, will testify about the technical aspects of the proposed amendments.
3. Mr. John Parizek, Chair, Minnesota Plumbing Board, will testify about the Board's interest in amending the Plumbing Code.
4. Other Department of Labor and Industry staff, if necessary.

RULE-BY-RULE ANALYSIS

4714.0050 TITLE; INCORPORATION BY REFERENCE.

This rule part adopts portions of the 2012 Uniform Plumbing Code, with amendments, by incorporation by reference.

4714.0100 BASIC PLUMBING PRINCIPLES.

This section lists 23 basic principles of health, sanitation, and safety that serve as the basis of this code. This language is carried forward from the current Plumbing Code, with minor grammatical clarifications. The Board has determined that these principles are necessary for protection of public health and the safety of all Minnesotans and will be used to clarify the intent of the code. This list of plumbing principles has been used for many years in the Minnesota Plumbing Code. The listed principles are necessary and reasonable to guide interpretation for unforeseen situations that are not covered in the code.

4714.0101 CONFORMANCE WITH CODE.

Subpart 1. Scope. Subpart 1 states that this code "all new plumbing installations performed anywhere in the state." The proposed language is taken from Minnesota Statutes, sections 326B.43 and 326B.52. It is reasonable to clearly state the scope of the code.

Subpart 2. New buildings. Subpart 2 clarifies that all new plumbing installations in new buildings must meet the full provisions of this code. Although the scope stated in subpart 1 includes new plumbing installations in new buildings, this subpart explicitly includes them.

Subpart 3. Existing buildings. Subpart 3 requires new materials and work to existing plumbing installations in existing buildings to meet the full provisions of the code when they are added, altered, renovated, or replaced. Although the scope stated in subpart 1 includes additions, alterations, and replacements, this subpart explicitly includes them. However, deviation from this code in existing buildings may be approved by the authority having jurisdiction if there is undue hardship or excessive difficulty to meet this code and the public would not be endangered. This deviation is necessary and reasonable because public safety is maintained while balancing preservation of existing buildings in a more cost-effective manner than requiring full compliance with this code.

Subpart 4. Changes in building occupancy. Subpart 4 requires plumbing installations in existing buildings or structures undergoing a change in use or occupancy to meet the plumbing requirements of the new use or occupancy. It is necessary and reasonable to require a building or structure to have plumbing installations consistent with its use and occupancy and the current code.

Subpart 5. Moved buildings. Subpart 5 requires buildings moved into the jurisdiction of the code to comply with the code. Moved buildings may have been compromised through the removal and re-install process and is reasonable to be considered new proper assessment of the moved buildings for health and safety of the occupants.

Subpart 6. Health and safety. Subpart 6 allows existing plumbing and drainage systems to operate and be maintained in accordance to an earlier code under which it was installed unless the Authority Having Jurisdiction deems the plumbing or drainage system to be dangerous, unsafe, unsanitary or a nuisance or hazard to life, health or property. This is necessary and reasonable for health protection and safety yet balanced to permit existing plumbing and drainage systems.

Subpart 7. Commissioner's authority. Subpart 7 clarifies that although some local jurisdictions may be delegated authority to enforce this code, the commissioner retains ultimate authority to enforce this code. This is particularly important in regard to code enforcement disputes between the enforcing entity and the regulated party.

4714.0203 TERMS DEFINED BEGINNING WITH A.

Subpart 1. Added Definitions.

Administrative Authority. The proposed amendment adds a definition of the term “administrative authority” to mean the commissioner of labor and industry except when a local governing body adopts, maintains, and enforces this code in its entirety. The term is added because it is a term used in the existing plumbing code and is therefore a familiar term with regulated parties. It is necessary and reasonable to define the term for clarity.

Subpart 2. Amended Definitions.

Approved. The proposed amendment amends the UPC's definition of the term “approved.” The amended definition is consistent with the definition for “approved” in other Minnesota State Building Code chapters, of which the plumbing code is a part of, and provides objective approval parameters that the UPC definition lacks. It is reasonable to provide coordinated definitions of

frequently used terms throughout the building code to avoid conflicts or confusion of terms from one chapter to another.

Authority Having Jurisdiction. This is a term used throughout the UPC over 500 times. Instead of amending each use of the term in the UPC, the Board proposes to amend the definition to have the same meaning as “administrative authority,” the established and familiar term in the existing plumbing code. Furthermore, the UPC definition would cause confusion if used in Minnesota because it is too broad and includes possible authorities having jurisdiction that cannot be regulated by the plumbing code.

4714.0205 TERMS DEFINED BEGINNING WITH C.

Subpart 1. Amended Definitions.

Certified Backflow Assembly Tester. The proposed definition refers to the definition in Minnesota Statutes, section 326B.42, subdivision 1c to clarify that this term has the same meaning as “backflow prevention tester.” The two terms have the same intended meaning but “backflow prevention tester” is specific to Minnesota.

Clear Water Waste. The proposed definition clarifies that “clear water waste” must be uncontaminated waste discharges, groundwater discharges and similar discharges. The UPC definition includes all discharges from heating and cooling equipment including contaminated discharges. Contaminated discharges pose a risk to health and public safety. Including contaminated discharges in the definition could conflict with or cause confusion with other parts of this code or other codes in Minnesota. The proposed amendment is reasonable to protect the health and safety of the public and coordinates with other rules for proper disposal of discharges from heating and cooling equipment.

Code. The proposed definition clarifies that the term “code” means the Minnesota Plumbing Code, MN Rules, Chapter 4714. The UPC definition is generic and not useful as applied to the plumbing code.

Subpart 2. Added Definitions.

Commissioner. The proposed definition clarifies that “commissioner” means the commissioner of labor and industry or a duly designated representative of the commissioner who is either an employee or a person working under contract with the department of labor and industry. This is needed and necessary for consistent use and enforcement of the term use in this code.

4714.0206 TERMS DEFINED BEGINNING WITH D.

Drainage System. The proposed amendment modifies the UPC definition to clarify that pipes conveying rainwater are considered part of a drainage system of a plumbing system. It is the intent of the Board to continue to include rainwater pipes in the definition of “drainage system” as it is in the existing plumbing code. The proposed definition is reasonable and necessary to maintain consistent use and enforcement of drainage system regulation. The UPC definition of “drainage system” includes piping only for “sewage or other liquid wastes.”¹⁵ The UPC definition

¹⁵ Liquid waste is defined in the UPC as “The discharge from a fixture, appliance, or appurtenance in connection with

is unclear as to whether rainwater is included. The proposed amendment clarifies the definition by explicitly listing rainwater. Because rainwater catchment systems and storm drainage systems are regulated in this code, it is reasonable to clarify that drainage systems that convey rainwater are generally subject to drainage system requirements.

4714.0210 TERMS DEFINED BEGINNING WITH H.

Subpart 1. Amended Definitions.

Hydromechanical Grease Interceptor. The proposed definition removes item D from the UPC definition. Item D of the UPC definition permits indirect connection without external flow control, to a drainage system, which conflicts with the drainage system installation requirements in sections 704.3 as amended. Section 704.3 requires commercial kitchen fixtures to be directly connected to the drainage system. Therefore, it is reasonable to remove the item that conflicts with another part of the code.

Subpart 2. Added Definitions.

Health Authority. The proposed definition of “health authority” clarifies that the entity with authority over the drinking water supply is different from the Authority Having Jurisdiction, administrative authority or commissioner. It clarifies that it is the entity which has established rules governing the drinking water supply.

4714.0218 TERMS DEFINED BEGINNING WITH P.

Plumbing System. The proposed definition of “plumbing system” is amended to include nonpotable water piping serving plumbing fixtures whereas the UPC definition does not include nonpotable water piping. Nonpotable water piping can be part of a plumbing system and therefore has been added to this definition. This amendment is necessary in order to include nonpotable water piping serving plumbing fixtures in the rainwater catchment system regulations in UPC Chapter 17, as amended in this code.

Potable Water. The proposed definition amends “health authority having jurisdiction” to “health authority” to coordinate with health authority defined above. Furthermore, the term is consistent with the definition of “health authority” as defined in part 4714.0210.

Private Sewage Disposal System. The proposed definition reflects the term used by the Minnesota Pollution Control Agency (MPCA) because MPCA regulates private sewage disposal systems in Minnesota. MPCA uses the term subsurface sewage treatment system. Because MPCA regulates this type of system, it is reasonable to include MPCA’s preferred terminology here and refer to MPCA for clarification and coordinated enforcement.

4714.0220 TERMS DEFINED BEGINNING WITH R

Registered Professional Engineer. The proposed definition “registered professional engineer” is commonly used throughout the 2012 UPC. The definition also includes references to “engineer” and “registered engineer” because the UPC uses those terms as well to mean the same

a plumbing system that does not receive fecal matter.” See UPC section 214.

thing. The term “registered professional engineer” was chosen to coordinate with licensure requirements for the practice of professional engineering as described in Minnesota Statutes, section 326.02, subdivision 3, that are specific to the State of Minnesota as a professional engineer by the Board of Architecture, Engineering, Land Surveying, Landscape architecture, Geoscience, and Interior Design. The proposed amendment is needed and reasonable for consistent and clear use of the term in this code.

4714.0221 TERMS DEFINED BEGINNING WITH S.

Single-family Dwelling. The proposed definition references the definition for dwelling, single-family in Minnesota Rules, Chapter 1309. Chapter 1309 is the residential building code chapter and part of the Minnesota State Building Code. Referencing the definition in 1309 is reasonable and necessary because doing so coordinates the definition with other state rules for consistent use and enforcement of the term.

4714.0301 SECTION 301.0 MATERIALS - STANDARDS AND ALTERNATIVES.

Subpart 1. Section 301.1 Minimum Standards.

The proposed amendment to UPC 301.1 deletes the reference to the mechanical code language requirements since it’s not regulated in this code.

Subsection 301.1.2. The proposed amendment removes the language regarding whether Appendix I is part of the code or not because Appendix I, with some exceptions, is proposed for incorporation by reference in part 4714.0050. To avoid confusion whether Appendix I is available for convenience or part of the code, this language is deleted.

Subsection 301.1.3. The proposed amendment deletes this subsection in its entirety because plumbing in existing building is addressed in part 4714.0101, subparts 3 and 6.

Subpart 2. Section 301.2 Alternate Materials and Methods of Construction Equivalency.

The proposed amendment adds “Prior to installation” to the second sentence to clarify that technical documentation of alternate materials and methods to the code that demonstrates equivalency must be submitted for approval before installation occurs. Approval before installation eliminates additional costs that might result if installation begins before the alternates are approved and need revision per the Authority Having Jurisdiction. Additional proposed amendment to this section clarifies that alternates to the code submitted for approval shall not be prohibited elsewhere in the code or law. The proposed amendments establish reasonable requirements that permit alternates from the code to keep current with new technologies while maintaining public safety and reasonable costs.

Subpart 3. Section 301.4.6 Inspection and Testing.

The UPC section requires alternative engineered designs be tested and inspected. The proposed amendment further specifies that the registered professional engineer must certify that the registered professional engineer (or designee) has visually inspected the system and that installation was properly implemented. That is, the proposed amendments provide clarity to the vague UPC language. Most alternative engineered designs are complex and require expertise in the registered professional engineer’s field. Therefore, visual inspection by the registered professional engineer or their designee reasonably ensures that the installation is in accordance with the engineered design.

4714.0307 LOCATION.

UPC section 307.1 System.

The proposed amendment deletes the words “private sewage disposal system” from the list of items to which the section applies. Private sewage disposal systems are regulated by the Minnesota Pollution Control Center under Minnesota Rules, Chapter 7080.

4714.0311 INDEPENDENT SYSTEMS.

Subpart 1. Section 311.0 Use of Public Sewer and Water Systems Required.

The proposed amendment retitles the section from “Independent Systems” to “Use of Public Sewer and Water Systems Required” to more accurately describe the proposed amendments in subpart 2 below.

Subpart 2. Section 311.1 General.

The proposed amendment replaces the entire UPC section 311.1, including the exception, with language that requires connections of building services to public water and sewer when available and feasible, unless otherwise permitted by the Administrative Authority. The UPC section is conceptually similar to the proposed amendment. The UPC exception allows the extension of a front building drain to a rear building if no private sewer is available. This is deleted because connecting new building sewer to another building sewer restricts access to a sewer for maintenance, presents potential legal property damage ramifications from sewer back-ups into another building and possible trespassing issues. The proposed language is largely taken from the existing Minnesota Plumbing Code, part 4715.0310, with grammatical changes and updates. This requirement offers economic benefits for property owners and better public health protection. Maximizing use of available public water and sewer systems offers lower costs to each participant and consistent maintenance of the systems. The public sewer and water systems are coordinated in a way to provide efficient and safe systems. Private sewer and water, while sometimes a better option, are typically second to public systems in terms of overall quality and safety.

4714.0312 PROTECTION OF PIPING, MATERIALS, AND STRUCTURES.

Subpart 1. Section 312.7 Fire-Resistant Construction.

The proposed amendment replaces the UPC reference to “the building code and Chapter 15, ‘Firestop Protection’” with “the State Building Code.” UPC chapter 15 is not incorporated by reference in this code. Firestop protection as it is used here is regulated in the Minnesota State Building Code. The Board does not have statutory authority to regulate fire-resistant construction.

Subpart 2. Section 312.9 Steel Nail Plates.

The proposed amendment replaces the UPC reference to “Section 1210.3.3” in the exception with “Minnesota Rules, chapter 1346, Minnesota Mechanical and Fuel Gas Codes.” Chapter 12, Fuel Gas Piping, of the UPC is not incorporated by reference into this code. In Minnesota, fuel gas piping is regulated in chapter 1346. The Board does not have statutory authority to regulate gas piping.

4714.0313 HANGERS AND SUPPORTS.

Section 313.7 Gas Piping.

The proposed amendment deletes UPC section 313.7 because it is a gas piping requirement. In Minnesota, gas piping is regulated in chapter 1346, the Minnesota Mechanical and Fuel Gas Code. The Board does not have statutory authority to regulate gas piping.

4714.0314 TRENCHING, EXCAVATION, AND BACKFILL.

Section 314.0 Trenching, Excavation, and Backfill.

The proposed amendment deletes this section in its entirety. This section is in conflict with federal Occupational Safety and Health Administration (OSHA) laws and regulations relating to requirements of trenching, excavation, and backfill. Trenching regulations are governed by Federal OSHA laws in 29 CFR and not this code. The UPC section is not necessary. The Board does not have statutory authority to regulate trenching, excavation and backfill.

4714.0315 JOINTS AND CONNECTIONS.

Section 315.1 Unions.

The proposed amendment deletes the language that references gas piping. Gas piping is regulated in chapter 1346, the Minnesota Mechanical and Fuel Gas Code. The Board does not have statutory authority to regulate gas piping. The proposed change is needed and necessary to eliminate conflicts with other state code requirements.

4714.0317 FOOD-HANDLING ESTABLISHMENTS.

Section 317.1 General.

The proposed amendment clarifies what the plumbing requirements are for drainage piping installed over food preparation, and storage areas. The UPC language is amended to require soil or drain pipes installed over food areas to have minimum protection to prevent food contamination. Possible contamination of food being stored or prepared below the drainage piping can lead to sickness and public health outbreaks at food establishments. Therefore, it is reasonable to establish specific requirements to protect the health and safety of the public.

The proposed amendment also deletes redundant requirements of code-approved drainage piping materials that is already addressed under Section 701.1 and Table 1401.1.

4714.0319 MEDICAL GAS AND VACUUM SYSTEMS.

The proposed amendment deletes UPC section 319.0 in its entirety. The Board does not have statutory authority to regulate the installation of medical gas and vacuum systems.

4714.0403 WATER-CONSERVING FIXTURES AND FITTINGS.

Section 403.3.1 Nonwater Urinals.

The proposed amendment removes the requirement to install a water distribution line rough-in that allows for installation of an approved backflow prevention device in the event of a retrofit. Instead, the proposed amendment requires a water-supplied fixture be installed upstream of the nonwater urinal at the end of the same drainage branch. That is, the UPC requirement creates

dead-ends where water lines are capped, causing stagnant water which could lead to concerns associating with growth of organisms in dead-ends. Such growths would affect the quality of drinking water and become a public health concern. The proposed change is also necessary to minimize construction cost of plumbing installation by preventing future provision that will add costs to current projects in the event of future retrofit cost. Retrofit costs should only be the responsibility of an owner at the time of replacement.

Unlike water supplied plumbing fixtures, nonwater urinal does not use water to flush the urine or to dilute urine in the fixture drainage piping, an additional requirement is added to require a water supplied fixture upstream of the nonwater urinal installation to dilute the urine in the fixture drainage piping. This is necessary to reduce and prevent build-up of urines in the fixture drainage piping when installing nonwater urinals to minimize premature failures of the drainage system.

4714.0406 PROHIBITED FIXTURES.

Section 406.3 Miscellaneous Fixtures.

The proposed amendment deletes the subsection in its entirety. Subsection 406.3 specifically prohibits certain fixtures including wooden and tile wash trays for domestic use. UPC section 401.1, which is not amended in this code, addresses the quality of fixtures and applies to all plumbing fixtures. Any non-code-approved fixtures are not considered a standard plumbing fixture and must be reviewed and approved by the Authority Having Jurisdiction in accordance with UPC section 301.1 and 301.2, as amended. It is redundant to keep subsection 406.3 and may cause confusion. Dry or chemical toilets which include composting and portable chemical toilets are not allowed for installation in a building used for human habitation. Furthermore, this subsection gives the “health officer” authority or discretion over these fixtures when the term “Health Officer,” is not defined in the UPC and it is not a clear term in Minnesota. Lastly, “health officers” are not the administrative authority or Authority Having Jurisdiction with authority to approve plumbing fixtures. Therefore, deletion of this section prevents confusion regarding review and approval of alternate plumbing materials and fixtures.

4714.0409 BATHTUBS AND WHIRLPOOL BATHTUBS

Section 409.1, Application.

The proposed amendment specifically adds requirement for whirlpool pedicure tubs. Whirlpool pedicure tubs are plumbing appliances and function similarly to typical whirlpool bathtubs. The differences are that the whirlpool pedicure tub size is much smaller than a typical whirlpool bathtub and only feet are submerged instead of the entire body like a typical whirlpool bathtub. Whirlpool pedicure tub fixtures raise concerns of sanitation because disease could be spread through water retained in the tubs and recirculated or unitized jet components similar to a typical whirlpool bathtub, particularly when used in commercial salons. Whirlpool pedicure tubs are intended for submerging only feet so suction and hair entrapment requirements are not safety concerns that need to be addressed here. The whirlpool bathtub standards are ASME A112.19.7, Hydromassage Bathtub Appliances, and IAPMO IGC 155, Pipeless Whirlpool Bathtub Appliances. The applicable sections in ASME A112.19.7 which apply to whirlpool pedicure tubs are general requirements which cover material construction, water pump standard UL 1795, and circulation/air piping which includes water retention requirements. The applicable sections of

IAPMO IGC 155 are all sections of this standard. Therefore, minimum requirements for health and sanitation are established to protect public health.

4714.0415 DRINKING FOUNTAINS.

Section 415.2, Public Use Fountains.

The proposed amendment adds language taken from a portion of existing Minnesota Rules, part 4715.1260, with two changes. The existing language includes the word “bubbler” after “drinking fountain” but is not included in the proposed language because the term is no longer used in common language and is not defined. Also, “must” is changed to “shall.” The proposed amendment prohibits a combined faucet and drinking fountain unit unless there is at least an 18-inch separation between the drinking fountain and any other faucet spout. The required separation prevents unsanitary conditions such as the spread of disease from hands, saliva, and water flow off body parts splashing from the use of fixtures.

4714.0418 FLOOR DRAINS.

Subpart 1. Section 418.4, Food Storage Areas.

The proposed amendment is not substantively different from the UPC language. There are some minor grammar changes but largely replicates the UPC language. This section requires drains located where food is stored, such as walk-in coolers, must have indirect waste piping to the drainage system, traps and must be vented. This code does not regulate when drains will be located in food storage areas but does regulate their installation when they are. Indirect drains in spaces where freezing temperatures are maintained must be located where the seal will not freeze. The requirements in this section are necessary to protect any possibility of sewer back-up or contamination to food storage areas/compartments, or walk-in coolers and freezers when drains are allowed to be installed by the licensing authority.

Subpart 2. Section 418 additions.

Section 418.6 Elevator Pit Drain.

The proposed amendment adds this subsection to address specifically elevator pit drains. The language is in the existing Minnesota Plumbing Code, with the exception of a word change from “must” to “shall.” The amendment requires the proper method of draining elevator pits consistent with the Minnesota Elevators and Related Devices Code, chapter 1307. Because elevator pits collect hydraulic fluid, grease, and oily waste from elevator equipment, elevator pits must drain to the building sanitary system. Furthermore, the elevator pits must drain dry at all times and must discharge waste to the building sanitary system by an indirect connection to protect a sewage backup into the elevator pit creating an unsanitary condition in the pit.¹⁶ When a sump is used to receive pit drainage, the sump must be placed outside the elevator pit with a dry pan drain installed in the pit that flows into the sump. Sumps are located outside elevator pits for direct access for maintenance and inspections of the sumps and pumps without entering the elevator pit.

Section 418.7 Garage and parking area floor drains.

¹⁶ Drain dry means that the pits will drain to complete dryness at all times so no waste remains in the elevator pit.

The proposed amendment adds a section that requires drains in enclosed garages to discharge to the sanitary sewer instead of the storm sewer. Drains in enclosed garages generally do not collect rainwater, but will collect oil, grease, even vehicle wash waste, and other types of waste from vehicles that need proper treatment and discharge to the sanitary sewer. Open areas of parking ramps will collect significant amounts of rainwater and must discharge to the storm sewer with an exception that the municipal sewer authority may determine other approved places of disposal as necessary for open parking ramp drainage.

Exception. An exception for floor drains in one- and two-family dwellings allows discharge to “daylight” when approved by the local administrative authority. “Daylight” is an industry term used to mean outdoors; in this case, outside of the garage. The need for local administrative authority approval is necessary to ensure the discharge is within the owner’s property line, does not cross other properties, and does not flow into surface water. The scope is limited to one- and two-family dwellings so no commercial or industrial garages may discharge to daylight. This practice is currently in use and was coordinated with and acceptable to the Minnesota Pollution Agency.

4714.0420 SINKS.

Section 420.3 Waste Outlet.

The proposed amendment largely replicates the UPC language but clarifies that commercial pot and scullery sinks must be provided with waste outlets that are at least two inches in diameter because these sinks have large compartments holding a large volume of water and must be able to handle commercial kitchen functions.¹⁷ For these reasons, the waste outlet of each compartment of the sink must be provided with minimum 2-inch waste outlets for proper draining. A 1-1/2 inch waste outlet would take longer to drain than a 2-inch waste outlet and the concern is that if the sinks do not drain quickly enough, unapproved methods resulting in unsanitary conditions will be used and put the drainage system at risk.

4714.0421 FIXTURES AND FIXTURE FITTINGS FOR PERSONS WITH DISABILITIES.

Section 421.2 Limitation of Hot Water Temperature for Public Lavatories.

The proposed amendment limits the maximum temperature to 110 degrees Fahrenheit where the UPC limit is 120 degrees Fahrenheit. This amendment is necessary because Minnesota Rules chapter 1323, the Commercial Energy Code, incorporates by reference the 2012 International Energy Conservation Code, Commercial Provisions, which limits the maximum temperature for public lavatories to 110 degrees Fahrenheit.¹⁸ This amendment is consistent with the Minnesota Commercial Energy Code.

4714.0422 MINIMUM NUMBER OF REQUIRED FIXTURES.

Subpart 1. Section 422.1 Required Minimum Number of Fixtures

¹⁷ Commercial kitchen functions include use and washing of large-scale pots and pans and a larger quantity and frequency of washing as compared to household kitchen functions, for example.

¹⁸ See section C404.3 Temperature Controls of the 2012 International Energy Conservation Code, as amended.

Minimum fixture requirements are regulated by the Minnesota Building Code, Chapter 1305, not the Minnesota Plumbing Code. Therefore, the proposed amendment references the Minnesota Building Code in chapter 1305. The proposed amendment also clarifies that the minimum fixture requirements listed in the Minnesota Building Code apply to all facilities subject to the Minnesota Plumbing Code.

Subpart 2. Sections 422.1.1 to 422.5.

These UPC sections regulate different types of facilities and the minimum number of required fixtures in them. Because the minimum fixture requirements are regulated in the Minnesota Building Code, Chapter 1305, these sections are proposed to be deleted.

Subpart 3. Table 422.1

Table 422.1 is titled, “Minimum Plumbing Facilities.” It is referenced only in UPC section 422.1. However, the amended section 422.1 deletes all references to Table 422.1 because minimum plumbing fixture requirements for facilities are regulated in the Minnesota Building Code, Chapter 1305. Therefore, UPC Table 422.1 is proposed for deletion.

4714.0501 GENERAL.

Section 501.1 Applicability

The proposed amendment clarifies that this chapter as amended applies to the construction, location and installation of fuel-burning and other water heaters heating potable water. The proposed amendment deletes “together with chimneys, vents, and their connectors” because the Board does not have statutory authority to regulate the chimneys, vents and connectors.

4714.0503 INSPECTION.

The proposed amendment deletes UPC sections 503.0 to 503.2. Section 503.0 is just the section title. Section 503.1 regulates inspections of chimneys or vents. This section is proposed for deletion because the Board does not have statutory authority to regulate chimneys or vents, including inspections of them.¹⁹ Therefore, such inspections cannot be part of the Plumbing Code. Section 503.2 regulates final inspection of water heaters. This section is proposed for deletion because Minnesota Rules, part 1300.0215 authorizes the administrative authority to inspect installation and construction authorized by the permit, including for water heaters.²⁰ If this section is not deleted, there would be redundant water heater inspection rules.

4714.0504 WATER HEATER REQUIREMENTS.

Subpart 1. Sections 504.1 to 504.2

The proposed amendment deletes UPC sections 504.1 through 504.2 because they contain venting, self-closing, and door requirements for water heater installations in bedrooms and bathrooms. These venting, self-closing and door requirements go to the structure near and around the water heater and are not part of plumbing.²¹ The Board does not have statutory authority to

¹⁹ Chimneys and vents are regulated in the Minnesota Mechanical and Fuel Gas Code in chapter 1346.

²⁰ [Minnesota Rules, part 1300.0215](#).

²¹ Venting, self-closing and door requirements are regulated in the Minnesota Mechanical Code, Minnesota Rules,

promulgate rules regarding non-plumbing regulations. The proposed deletion also eliminates conflicts with other code requirements.

Subpart 2. Section 504.6.

The proposed amendment deletes the reference to automatic gas shut-off devices because those are regulated in the Minnesota Mechanical Code, Chapter 1346. The Board does not have statutory authority to regulate such devices.

4714.0505 OIL-BURNING AND OTHER WATER HEATERS.

This subsection regulates single-wall heat exchangers. The proposed amendment deletes section 505.4.1²² “Single-Wall Heat Exchanger” but relocates the text, with grammatical amendments, to a proposed new section 603.5.4.1²³ “Single-Wall Heat Exchanger.” The requirements relocated from section 505.4.1 to section 603.5.4.1 establish safety parameters for single-wall heat exchangers to protect the potable water system and prevent cross-connection contamination. It is well-established in the Minnesota plumbing industry that regulation of single-wall heat exchangers will be covered under potable water protection rather than specifically under water heaters. It is reasonable to locate these requirements under “Heat Exchangers,” section 603.5.4, instead of under the limited parameter of water heaters, section 505.

4714.0506 AIR FOR COMBUSTION AND VENTILATION.

UPC sections 506.0 to 506.9 regulate portions of heating, ventilation and air conditioning (“HVAC”) systems. In Minnesota, HVAC systems are regulated in the Minnesota Mechanical Code, Chapter 1346. The Board does not have statutory authority to regulate HVAC systems.

4714.0507 OTHER WATER HEATER INSTALLATION REQUIREMENTS.

Subpart 1. Sections 507.6 to 507.11 and 507.14 to 507.23.

The proposed amendment deletes UPC sections 507.6 to 507.11 and 507.14 to 507.23 because they provide requirements for gas appliances; specifically, use of air for combustion and ventilation, fire resistance constructions installed in commercial garages and air craft hangars, and gas piping and venting of gas appliances, all of which are HVAC-related requirements. Gas appliances and HVAC systems are governed by the Minnesota Mechanical Code, Chapter 1346. The Board does not have statutory authority to regulate gas appliances or HVAC systems.

Subpart 2. Section 507.5 Relief Valve Discharge.

The proposed amendment adds one sentence to the end of the UPC language, “Discharge relief valves shall terminate to a safe place of disposal or within 18 inches of the floor.” This added language is taken from the existing Plumbing Code, with minor grammatical differences for clarification.²⁴ The proposed amendment specifies a location for the discharge of a water heater

Chapter 1346.

²² The headings this location falls under are section 505 Oil-Burning and Other Water Heaters; 505.4 Indirect-Fired Water Heaters; 505.4.1 Single-Wall Heat Exchanger.

²³ The headings this location falls under are section 603 Cross-Connection Control; 603.5 Specific Requirements; 603.5.4 Heat Exchangers; 603.5.4.1 Single-Wall Heat Exchanger.

²⁴ See Minnesota Rules, [part 4715.2210, subpart 4](#).

relief valve to supplement the UPC's general statement of prohibition. Because the temperature relief valve is set by the manufacturer to release at 210 degrees Fahrenheit, unsafe conditions, including the risk of scalding the public and occupants, exist if the valve is not located in a safe place. It is reasonable for a water heater relief valve to discharge to a location that will not create an unsafe situation.

4714.0508 APPLIANCES ON ROOFS.

UPC section 508 contains requirements for appliances on roofs. Because these requirements are not considered "plumbing," the proposed amendment deletes the entire section. Appliances on roofs are regulated in the Minnesota Mechanical Code, Chapter 1346. The Board does not have statutory authority to regulate appliances on roofs.

4714.0509 VENTING OF APPLIANCES; 4714.0510 SIZING OF CATEGORY I VENTING SYSTEMS; 4714.0511 DIRECT-VENT APPLIANCES.

UPC sections 509 through 511 regulate venting of appliances. These requirements are not considered "plumbing." In Minnesota, venting of appliances is regulated in the Minnesota Mechanical Code, Chapter 1346. The Board does not have statutory authority to regulate venting of appliances.

4714.0601 HOT AND COLD WATER REQUIRED.

601.1 General.

UPC section 601.1 provides general potable running water requirements. The proposed amendments make minor grammatical changes for clarification and add language. The new language requires return circulation type hot water supply systems in buildings that are four stories or higher and buildings where the developed length of hot water piping from the source of hot water supply to the farthest fixture supplied exceeds 100 feet. This requirement is added to conserve water and safely maintain adequate hot water demand within a reasonable time period. The threshold length of 100 feet is an industry standard because lengths beyond 100 feet will result in unnecessary amounts of potable water being wasted while waiting for hot water to dispense and also poses insufficient washing conditions.

4714.0602 UNLAWFUL CONNECTIONS.

Subpart 1. Section 602.2, Cross-contamination

The proposed amendment reorganizes the UPC language to clarify that a backflow prevention device is required in order for certain connections to the domestic water supply to exist. The proposed amendment also supplements the UPC requirement to clarify that each point of use shall be separately protected and that the potentially contaminating water shall be discharged into the drainage system and not returned to the potable water system. Much of this new language is in the existing plumbing code at part 4715.1912, with the addition of water used for heating equipment. The rule protects the potable water systems from contaminants including oil, grease, other petroleum products, refrigerants, materials not approved for potable water contact, and metal particles in water-cooled waste streams. This is a reasonable measure to protect safe drinking water.

4714.0602 Subp. 2. Section 602.4, Approval by Authority

The proposed amendment deletes the UPC references to “Health Department, or other department having jurisdiction in order to prevent confusion or conflict as to what agency is qualified and authorized to approve connections that could potentially contaminate the water supply system. The amended section is consistent with the existing plumbing code in part 4715.1920 and reasonably protects the drinking water system.

4714.0603 CROSS-CONNECTION CONTROL.

Subpart 1. Section 603.2, Approval of Devices or Assemblies

The proposed amendment deletes one reference to the Authority Having Jurisdiction as the authority that approves a device or assembly to clarify that the device or assembly must be approved as defined in this code.²⁵ The backflow prevention devices or assemblies must also meet testing requirements and comply with Table 603.2, “Backflow Prevention Devices, Assemblies, and Methods,” unless excepted in sections 603.5.1 through 603.5.23. The proposed amendments adjust the reference to “603.5.21” to subsection “603.5.23” because the proposed amendment adds two provisions.

In the last paragraph, the words, “or otherwise approved by the Authority Having Jurisdiction” are deleted because who can perform backflow testing is regulated in Minnesota Rules, chapter 4716.

Subpart 2. Section 603.5.4, Heat Exchangers

The proposed amendment amends the UPC language by replacing the reference to section 505.4.1 with the requirements of 505.4.1. Along with relocating the requirements to this section, the language is reformatted for clarity and modified to permit connection to low-pressure steam systems but is otherwise replicated exactly. It is reasonable to put all requirements for single wall water heaters in one location, here in section 603.5.4, for the convenience of users of this code.

Subpart 3. Section 603.5.12, Beverage Dispensers

The proposed amendment adds, “made of copper” to the prohibitions that apply to carbonated beverage dispenser piping materials that are downstream of the backflow preventer. The water is carbonated downstream of the backflow preventer. Copper reacts strongly with carbon dioxide and dissolves at a rate that greatly exceeds the federal Maximum Contaminant Level of 1.3 milligrams per liter, a standard established to prevent short term gastrointestinal illness and long term liver or kidney damage. The amendment prohibits use of copper piping where carbonated water will flow.

Subpart 4. Section 603.5.18 Potable Water Outlets and Valves

The proposed amendment adds an exception to the UPC language that reads, “except for a freeze-proof yard hydrant that is located at least two feet above the water table and at least ten feet

²⁵ The definition of “Approved” is amended in part 4714.0204 to mean “approval by the administrative authority, pursuant to the Minnesota Plumbing Code, by reason of inspection, investigation, or testing; accepted principles; computer simulations; research reports; or testing performed by a nationally recognized testing laboratory.” This definition is consistent with other chapters of the Minnesota State Building Code.

from any sewer or similar source of contamination.” The added language is largely taken from the existing Minnesota Plumbing Code, part 4715.1800, subpart 1, with modifications. It is reasonable to permit freeze-proof yard hydrants to be underground, subject to the location requirements, because they are commonly used in Minnesota and have previously been permitted under the existing Plumbing Code.

Subpart 5 Section 603.5.22, Barometric Loop

The proposed amendment adds this subsection that regulates the use of barometric loops to the list of specific requirements. Barometric loops are permitted in the existing Plumbing Code as an acceptable method of cross-connection control. Barometric loops are an accepted cross-connection control method for use in the water distribution system where back siphonage hazards may exist when there is no backpressure backflow. The proposed amendment includes specific design and installation specifications. The barometric loop method is an option available in some situations to provide cross-connection control without the testing and maintenance requirements of other cross-connection control options. It is reasonable to offer this safe, simple and non-mechanical method for certain installations.

Section 603.5.23 Installation of Testable Backflow Prevention Assembly

The proposed amendment adds this subsection that regulates use of testable backflow prevention assemblies (devices) to the list of specific requirements. Testable backflow prevention assemblies are installed to protect potable water systems from the most dangerous and toxic contaminants. The standards listed in the proposed amendment (ASSE 1013, 1015, 1020, 1047, 1048 or 1056) address the material quality, performance requirements and design of the assembly but not specific field installation, testing, maintenance or removal of the assemblies. The UPC requires approval and annual testing of all devices or assemblies installed for the prevention of backflow in sections 603.2 and 603.4.2. However, the UPC does not address testing and inspection tags, and reporting as required in current Minnesota rules. In addition to adopting the existing Minnesota rule language, the proposed amendment adds a requirement that a community public water supplier (typically a municipal water utility) be notified when a testable backflow assembly is installed, tested, or removed from a community public water system. The proposed language does not require community public water supplier approval, but does require notification, so that the public water supplier is aware of changes to the public water system that could negatively affect water quality and safety of the entire public system. The testing requirement is reasonable and not overly burdensome for owners because these listed backflow devices and assemblies are already required by the ASSE standards with language for compliance with the manufacturers’ field testing requirements and recommendations. The proposed amendment would align the testing requirement for all testable devices for proper operations and functioning of these devices.

The terminology is changed from “reduced pressure backflow preventer” as used in the current Minnesota Plumbing Code, to “reduced pressure principle backflow prevention assembly” consistent with the term as used in the UPC.

4714.0604 MATERIALS.

Section 604.11, Lead Content

The proposed amendment replaces “8 percent” with “a weighted average of 0.25 percent in the wetted surface material, as established in the Safe Drinking Water Act, section 1417(d)” as the

maximum lead content of water pipe and fittings that convey potable water. Effective January 4, 2014, the federal Reduction of Lead in Drinking Water Act amended the federal Safe Drinking Water Act (SDWA), reducing the allowable amount of lead from 8% lead content (currently in the Plumbing Code, Minnesota rules part 4715.0500) to “not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings and fixtures.”²⁶ This amendment is necessary to comply with federal law.

4714.0608 WATER PRESSURE, PRESSURE REGULATORS, PRESSURE RELIEF VALVES, AND VACUUM RELIEF VALVES.

Section 608.5, Drains.

The proposed amendment reformats part of the UPC language for clarity and deletes other UPC language that permits drain tube and piping to terminate outside of a building. Instead of permitting discharge to the outside of a building, the proposed amendment requires discharge “to a safe place of disposal or within 18 inches of the floor,” both of which are indoors. Considerations for “a safe place of disposal” include whether the discharge will not cause damage to property or injure persons from high temperature discharge. The proposed amendment is reasonable because it provides a specific safe place to discharge to while leaving flexibility to reasonably accommodate unique situations.

4714.0609 INSTALLATION, TESTING, UNIONS, AND LOCATION.

Subpart 1. Section 609.6 Location.

609.6.1 Water supply near sources of contamination.

The proposed amendment adds a new subsection that establishes the required minimum separation distance between water supply and potential sources of contamination. Specifically, a minimum of ten feet horizontal separation distance of water supply near sources of contamination. The proposed amendment takes language from the existing Minnesota Plumbing Code, with amendments.²⁷ This requirement has been used and enforced for many years to protect the water supply system from contamination. Ten feet is a reasonable distance from possible sources of contamination because it is far enough to protect the water supply but not so far as to require excessive space; it balances the need to protect the water supply, risk and cost.

Subpart 2. Section 609. 11. Water Meters.

The proposed amendment adds requirements for water meter installation. The amendment clarifies that water meters must be located inside a building, installed at least 12 inches above a finished floor, readily accessible and rigidly supported. When it is not possible to install the water meter inside a building, an exception is available to accommodate location outside a building if other requirements are satisfied. The other requirements for meters located outside the building are: the meter must be enclosed in a structure not subject to flooding, high groundwater, or surface drainage runoff, protected from freezing and must be installed above grade when possible. If a water meter is installed below grade, the top of the structure must be located at least 12 inches above the finished grade, must be secured and must be accessible. The structure shall not be connected to any storm or sanitary sewer system. This amendment is reasonable because it

²⁶ See Public Law 111-380 at: www.doli.state.mn.us/CCLD/PDF/pe_lead.pdf.

²⁷ See [part 4715.2280](#).

maintains water meters safely while providing reasonable accommodations when optimal conditions are not possible.

4714.0610 SIZE OF POTABLE WATER PIPING.

Table 610.3 Water Supply Fixture Units (WSFU) and Minimum Fixture Branch Pipe Sizes

This table lists appliances, appurtenances or fixtures and provides the minimum fixture branch pipe size and the number of units required for private use, public use, and assembly.²⁸ Included in the list of appliances in the UPC is “Lavatory.” The proposed amendment changes it to read, “Lavatory (each basin), or hand sink.” The additions clarifies that “lavatory” means each basin and adds hand sinks to have the same minimum water piping sizing as lavatories. Lavatories are plumbing fixtures located in restrooms for hand washing. A hand sink is known in the plumbing industry to refer to plumbing fixture used for hand washing in hospitals, clinics, and commercial kitchens. That is, hand sinks are not typically in a room with a toilet whereas lavatories are. Because the two plumbing fixtures are similar in design and function, washing hands for sanitation, it is reasonable that the two fixtures have the same minimum piping sizes.

4714.0611 WATER CONDITIONING EQUIPMENT.

Sections 611.0 to 611.3

These sections provide general minimum requirements for water conditioning equipment in plumbing systems. The proposed amendments replace terminology, including the UPC title of section 611, “Drinking Water Treatment Units” with a new title, “Water Conditioning Equipment” to be consistent with the terms used in Minnesota Statutes for licensing and installation rules relating to water conditioning equipment. Drinking water treatment units are a type of water conditioning equipment. The proposed amendments establish a clear title in this rule for installers, designers, and the public that is consistent with the terminology in licensing statutes and installation rules.

Section 611.1 Application

The proposed amendment replaces UPC section 611.1 with Minnesota-specific requirements laid out in three subsections of water conditioning equipment. The changes are necessary to permit a variety of products, ranging from completely manufactured water conditioning equipment products to custom design equipment, available to the public while maintaining health and safety.

Subsection 611.1.1 Definition.

The proposed amendment adds a definition of water conditioning equipment to clarify the scope of this section. Clarification is particularly important here to know when this section applies.

Subsection 611.1.2 Manufacture and Assembly.

The UPC requires all water conditioning equipment (a.k.a. water treatment units) to comply with various national standards. Such a requirement is very limiting. The proposed amendments permit water conditioning systems to be manufactured as a complete system *or* to be

²⁸ “Assembly” is a term used in the 2012 International Building Code (“IBC”), proposed for incorporation by reference in Minnesota Rules, chapter 1305. See IBC section 303.

assembled as a complete system by a licensed plumbing contractor or licensed water conditioning contractor. Complete systems that are assembled must be assembled by a licensed professional to ensure assembly is done correctly and the system is safe. Allowing assembly of a system by a licensed contractor allows for more water conditioning system options for treatment of potable water system and provides for less costly installation because third-party certification is not required for assembled systems. There is a limited number of listed water conditioning products available to consumers and third-party testing of larger water conditioning equipment is not available in some cases. Therefore, permitting a licensed plumbing contractor or licensed water conditioning contractor accommodates the availability challenges.

An exception is given to water conditioning equipment that are used for non-potable use and are installed downstream of a code approved backflow preventer. These systems are not of the same concern since it's not intended for potable use and therefore, is reasonable that these systems do not need to be in compliance with standards established for potable water application.

Section 611.1.3 Labeling

The proposed amendment requires water conditioning equipment be labeled to identify the type of equipment and contact information of the manufacturer or licensed professional who assembled the system. Labeling is a reasonable requirement because it is easy to do and inexpensive but extremely useful.

Section 611.2 Airgap Discharge

The proposed amendment replaces “drinking water treatment units” with “water conditioning equipment” for consistency and clarity in the amendments. No substantive changes were made. .

Section 611.3 Connection Tubing

The proposed amendment replaces “drinking water treatment units” with “water conditioning units” for consistency and clarity in the amendments. No substantive changes were made.

Subsection 611.4 and Table 611.4

UPC subsection 611.4 and Table 611.4 are not amended.

4714.0701 MATERIALS.

Section 701.1, Drainage Piping

The proposed amendment makes grammatical changes for clarity and deletes the fire stop protection language because fire stop protection is not regulated by the plumbing code in Minnesota. The Board does not have statutory authority to regulate fire stop protection even when applied to piping installations.

4714.0702 FIXTURE UNIT EQUIVALENTS.

Section 702, Table 702.1, Drainage Fixture Unit Values (DFUs)

The proposed amendment adds “Shower,” in front of “Multi-head, Each” to clarify what the line is referencing. The proposed amendment adds, “Commercial Pot or Scullery” to the plumbing appliances, appurtenances, or fixtures list along with minimum requirements (2-inch trap and trap arm, four drainage fixture units for public buildings and four units for assembly

occupancies). “Commercial Pot or Scullery” are sinks that are designed, generally, with three compartments. Each compartment has a large holding capacity for washing commercial equipment and discharges to the drainage system.²⁹ A minimum 2-inch size trap and trap arm and four drainage fixture units for commercial pot and scullery sinks allows the sinks to drain within a reasonable period of time for sanitary purposes as these sinks are used in commercial applications.

The proposed amendment deletes the footnote 6 in the UPC that reads, “Water closets shall be computed as 6 fixture units where determining septic tank sizes based on Appendix H of this code” along with the footnote references in Table 422.1. The Minnesota Pollution Control Agency regulates septic tank sizing. The Board does not have statutory authority to regulate septic tank sizing. Table 422.1 also is proposed for deleted.³⁰ UPC footnotes and references numbered 7 and 8 are renumbered to 6 and 7, respectively.

4714.0704 FIXTURE CONNECTIONS (DRAINAGE).

Section 704.3 Commercial Dishwashing Machines and Sinks

The proposed amendment adds two types of sinks used in licensed commercial food establishments, “commercial kitchen sinks” and “beverage service sinks.” These sinks have similar functions and similar sanitary concerns as the other sink types listed and must have the same protection as any other commercial sinks prescribed in this section. It is reasonable to clarify that this requirement applies to commercial kitchen sinks and beverage service sinks.

This section requires a floor drain be connected to the fixture drain to protect any possible sewage backups into the fixture. The original UPC language requires a floor drain. The proposed amendment adds that the floor drain must be “constructed without backwater valves.” Specifying that the floor drain must not have backwater valves is important to prevent sewage backup into the fixture it intends to protect. Backwater valves, as defined in the UPC, are devices “installed in a drainage system to prevent reverse flow.” That is, if a backwater valve is installed in the floor drain adjacent to the fixture, sewage would backup into the sink instead of through the floor drain, causing possible contamination of the fixture. It is reasonable to specify that the floor drain must be constructed without a backwater valve for effective protection.

4714.0705 JOINTS AND CONNECTIONS.

Section 705.10.2 Expansion Joints.

The proposed amendment deletes the following language from the UPC, “except where in vent piping or drainage stacks” because that language provided an exception to the requirement that the expansion joints be accessible. Expansion joints are mechanical devices which are subject to failure regardless of location and need to be accessible for maintenance and repair. Expansion joints in vent piping or drainage stacks are equally subject to failure as expansion joints in other

²⁹ Commercial Pot or Scullery is added because it is different from Commercial With Food Waste appliances, which are already in the table. Commercial With Food Waste appliances typically receive more food waste than a commercial pot or scullery.

³⁰ See 4714.0422, pages 16-17 of this SONAR.

locations. Therefore, it is reasonable to delete language excepting them being accessible for maintenance and repair.

4714.0707 CLEANOUTS.

Section 707.4.1 Back-to-Back.

The proposed amendment adds a new subsection to require a cleanout on the vertical drain or vent serving back-to-back fixtures when a common vent at the same level is utilized. A cleanout is a capped opening in a drain pipe that can be accessed to unclog a pipe such as with a drain auger. When a sanitary cross is used in common venting, cleaning equipment cannot always be easily directed into the vertical drain from the trap arm unless the trap adapter is immediately adjacent to the sanitary cross.³¹ Because the horizontal distance between the sanitary cross and the trap opening will vary with building construction or drainage piping arrangement, discretion is also given to eliminate the cleanout where the vertical drain is accessible through the trap opening.

4714.0710 DRAINAGE OF FIXTURES LOCATED BELOW THE NEXT UPSTREAM MANHOLE OR BELOW THE MAIN SEWER LEVEL.

Section 710.12, Grinder Pump Ejector; 710.12.1 Discharge Piping.

The proposed amendment adds requirements that the sizing of the sump and pump capacity for grinder pumps must be adequate to prevent overloading.³² Grinder pumps are generally designed with low discharge rates and small sumps so the sumps can fill up quickly, creating an unsanitary condition in the building. The plumbing system designer must consider sizing of the sumps and pumps when using grinder pumps in the plumbing design. It is reasonable and more cost-effective to address pump capacity and sump basin size properly in the design to prevent sewage backing up into the building drainage system rather than trying to retrofit larger capacities after installation.

Section 710.13, Macerating Toilet Systems.

The proposed amendment deletes “where approved by the Authority Having Jurisdiction” from the first sentence. It is replaced with, “A macerating toilet system may only be installed in one- or two-family dwellings when gravity flow is not possible. Not more than one bathroom group, consisting of a toilet, a lavatory, and a shower or bathtub, may discharge into a macerating toilet system. Components of macerating toilet systems shall be accessible.” A macerating toilet system is a system comprised of a toilet and a sump with a macerating pump instead of relying on gravity flow with flushed water. This provision Macerating toilet systems are not designed for commercial application regardless of the number of bathroom groups or when gravity is not possible. . The amendment is reasonable because it specifies parameters when macerating toilet systems are appropriate rather than leaving unbridled discretion with the Authority Having Jurisdiction.

³¹ A sanitary cross is a fitting where vertical pipe and horizontal pipe intersect as a single unit. Trap arms are always on the horizontal arms of a sanitary cross.

³² A grinder pump is a wastewater conveyance device used to facilitate the removal of waste from an appliance, such as a toilet, through the pipes to the sewer system or septic tank.

Minor grammatical changes are proposed to subparts 710.13.1, 710.13.2 and 710.13.3 but no substantive changes have been made.

4714.0712 TESTING.

Section 712.1. Media

The proposed amendment deletes “except that plastic pipe shall not be tested with air” from the first sentence. This exception is deleted to accommodate winter conditions in Minnesota. Without the proposed deletion, the water test would be required on plastic pipe. In the winter, this would not be possible due to freezing temperatures and most buildings under construction are not heated. Testing plastic pipes with air is well known to Minnesota plumbing contractors . The proposed amendment modifies the language that allows the Authority Having Jurisdiction to require “the necessary points of access” to the plumbing system to isolate and add air for testing purposes. The modification clarifies that it is necessary to remove openings, including cleanouts, to test the plumbing system.

Section 712.4 Negative Test

The proposed amendment adds this subsection that requires negative pressure test or hydrostatic test for concrete manholes and concrete sewer lines. The negative pressure test must meet one of two recognized standards listed in the rule. The hydrostatic test must comply with section 1109.2.2. Negative pressure testing and hydrostatic testing are commonly used methods to test sewers. Negative pressure testing and hydrostatic testing are safe methods of testing manholes and sewer lines. Air testing concrete manholes and concrete sewer piping is unsafe to perform because there is risk of severe injury in large sewer pipes and manhole structures holding pressurized air as compared to air testing small drain pipes. It is unsafe because the pipe might explode. The proposed amendment reasonably requires safe methods of testing concrete manholes and concrete sewer lines that are similar in burden and cost as with the more dangerous methods.

Section 712.5 Finished Plumbing

The proposed amendment adds this subsection that requires a specific final test after plumbing fixtures have been set up to test their connections. It is reasonable to require final testing and this test is reasonable because it is effective, not overly burdensome and a standard final test method in the plumbing industry. A final test of newly constructed plumbing systems detects potential leaks and allows for repair before the systems are fully activated. Detecting and repairing leaks in a new plumbing system is easier to do before activation than after it is fully in use. Any leakage in fixture connections can result in unsanitary health conditions.

Section 712.6 Test Plugs or Caps.

The proposed amendment adds this subsection to require test plugs and caps for roof terminals to “extend above or outside the end of the vent pipe to provide visible indication for removal after the test has been completed.” That is, when a plumbing system is tested, test plugs and caps are used during the process. These test plugs and caps must be removed for the system to function normally when not being tested. In order to ensure all test plugs and caps are removed after testing, they must be visible.

4714.0713 SEWER REQUIRED.

Subpart 1. Section 713.1 Where Required

The proposed amendment deletes the UPC reference to section 101.8, existing construction, because chapter one of the UPC is not adopted by this rule. The proposed amendment adds a reference to part 4714.0101, subpart 6 because, like section 101.8, that rule part addresses plumbing and drainage systems in existing buildings.

Subpart 2. Section 713.5 Permit

The proposed amendment deletes this section that prohibits permits for the installation, alteration, and repair of a private septic system if a public sewer is available. Permits for private septic systems are not under the authority of the Board or the Department. Rather, permits for private septic systems are issued by Minnesota Pollution Control Agency.³³

Subpart 3. Section 713.7 Installation

The proposed amendment replaces “a department other than the Authority Having Jurisdiction” with “a municipal utility easement” because the amendment is more specific and clear and customized to apply to Minnesota. In Minnesota, building sewers under a municipal utility easement are not subject to the Minnesota Plumbing Code.

Subpart 4. Section 713.8 Single-family and two-family dwellings

The proposed amendment adds this subsection to regulate building sewer connections for single-family and two-family dwellings that are already connected to existing private sewage disposal systems. The UPC provides an exception to section 713.7. However, the language was confusing. The proposed amendment adds two-family dwellings to the scope of this section and clarifies the requirements that must be met and conditions present when these single-family and two-family dwellings do not connect to the public sewer system.

4714.0714 DAMAGE TO PUBLIC SEWER OR PRIVATE SEWAGE DISPOSAL SYSTEM.

The proposed amendment deletes, “or the Health Officer” because it is unclear who the Health Officer is and the Board does not have statutory authority to promulgate rules administered by other state agencies.³⁴ If not deleted, the term will create confusion and inconsistency in which authority entity grants approvals.

4714.0715 BUILDING SEWER MATERIALS.

Section 715.3 Existing Sewers

The proposed amendment adds, “cured-in-place pipe lining” to the first sentence to specify the type of trenchless methodology that is allowed under this code. The proposed amendment also adds, “Replacement using cured-in-place pipe liners shall not be used on collapsed piping or when the existing piping is compromised to a point where the installation of the liners will not eliminate hazardous or insanitary conditions.” The new sentence clarifies that conditions where the existing sewers are significantly damaged to the point that the lining will not provide sufficient remedy are

³³ See [Minnesota Rules, part 7082.0500](#).

³⁴ Rules that the Minnesota Plumbing Board promulgate are administered and enforced by the Minnesota Department of Labor and Industry.

not appropriate for using cured-in-place lining technology. It is reasonable to clearly prohibit the use of cured-in-place pipe lining when the existing sewers are substantially damaged to prevent insanitary conditions.

4714.0717 SIZE OF BUILDING SEWERS.

Section 717, Table 717.1 Maximum/Minimum Fixture Unit Loading on Building Sewer Piping

The proposed amendment deletes the asterisk reference to Appendices C (Alternate Plumbing Systems) and H (Private Sewage Disposal Systems). Neither appendix is adopted into this code. Private sewage disposal systems are regulated by the Minnesota Pollution Control Agency rules and are not part of this code. The table is otherwise unchanged. It is reasonable and necessary to maintain this table because portions of plumbing piping intersects with sewer piping regulated by MPCA but delete the reference to the appendices because they are not part of this code. It is important to coordinate state codes.

4714.0721 LOCATION

Table 721.1 Minimum Horizontal Distance Required from Building Sewer (feet)

UPC Table 721.1 provides required minimum horizontal distances from building sewer for various things. The proposed amendment deletes four of the six lines and related footnotes in the table because they are ambiguous, regulated by a different state agency or do not offer a benefit to the public such as adding protection to public health or the environment. The remaining two lines are amended.

Table line one regarding “Buildings or structures” deleted. Building or structures have not historically had a minimum distance required from the building sewer. No benefit is apparent from this requirement (UPC requires two feet minimum distance). Because there is no benefit from this requirement but it would add a burden, it is reasonable to delete this line.

Table line two regarding “Property line adjoining private property” deleted. UPC Table 721.1 lists the minimum horizontal distance from property line adjoining private property to building sewer as “clear.” There is a footnote that references section 312.3. Section 312.3 regulates building sewer and other piping as it relates to material and distance to a building or structure. It is unclear how this reference applies to the distance listed in line two of this table.

Table line three regarding “Water supply wells” amended. The table sets the minimum horizontal distance between building sewers and water supply wells at 50 feet. The proposed amendment replaces that measurement with a reference to Minnesota Rules, Chapter 4725, Wells and Borings, under the Minnesota Department of Health. Chapter 4725 contains distance requirements from building sewers. This amendment is necessary to avoid duplicative or conflicting regulations.

Table line four regarding “Streams” deleted. The table sets the minimum horizontal distance between building sewers and streams at 50 feet. The proposed amendment deletes this line because the Board does not have statutory authority to regulate the minimum horizontal

distance between building sewers and streams. Although the Minnesota Department of Natural Resources (DNR) does not regulate a horizontal distance requirement between streams and building sewers, DNR staff reviewed the table in light of Minnesota Rules, Chapter 6120 then supported the recommendation to delete line four from the table. The proposed amendment is reasonable and necessary to avoid confusion.

Table line five regarding “On-site domestic water service line” amended. The proposed amendment renames this line to “Building supply” to coordinate with the definition of “building supply” in the UPC. “Domestic water service line” is not defined in the UPC and is often misunderstood to mean water supply lines only to a residence. Rather, the term includes water service lines that serve commercial and public buildings as well as homes. The proposed amendment is necessary and reasonable because it removes ambiguity by using an existing, defined term in the table.

The minimum horizontal distance between building sewer and building supply is amended from one foot to 10 feet and the footnote is amended to read, “Unless otherwise permitted by the Administrative Authority and when installed in accordance with Section 720.0.” The proposed amendment provides increased protection of the building supply line from building sewer piping and is consistent with the recommended guidelines that are followed for water mains and sewers. The Minnesota Department of Health (“MDH”) is a member of the Great Lakes – Upper Mississippi River Board that has issued “Recommended Standards for Water Works.”³⁵ MDH follows those recommended standards.³⁶ In regard to the horizontal distance between water mains and sewers or septic tanks, the guidelines require 10 horizontal feet unless not practical, subject to review and approval. Because the water mains and sewer lines approach the property line being 10 feet apart, horizontally, it is reasonable that those lines remain 10 horizontal feet apart when they pass over the property line as building sewer and building supply lines. The exception in the table footnote allows the Administrative Authority to approve a minimum horizontal distance less than 10 feet if the building supply is installed in accordance with section 720.0. The proposed amendment is reasonable and necessary because it coordinates with regulations of the pipes outside the property line and establishes safe practices while allowing case-by-case determinations when necessary.

Table line six regarding “Public water main” deleted. The proposed amendment deletes line six, “Public water main” because public water mains are regulated by the Minnesota Department of Health. The Board does not have statutory authority to regulate this requirement. It is reasonable and necessary to delete a requirement the Board does not have authority to promulgate.

4714.0722 ABANDONED SEWERS AND SEWAGE DISPOSAL FACILITIES.

Sections 722.0 to 722.5

³⁵ See www.10statesstandards.com/.

³⁶ These guidelines are commonly referred to as the “10 States Standards.” Please see 10statesstandards.com/waterrev2012.pdf.

The proposed amendment deletes sections 722.0 to 722.5 in their entirety. The Board does not have statutory authority to regulate abandoned sewage disposal facilities.³⁷ Abandoned sewers are regulated by local ordinances in Minnesota. It is necessary and reasonable to delete these subsections to avoid conflict with existing local ordinances and to avoid promulgating regulations without statutory authority.

4714.0723 BUILDING SEWER TEST.

Section 723.1

The proposed amendment deletes the language which prohibits testing DWV (plastic) piping using an air test method. The following sentence is added in its place, “Testing of building sewers shall be in accordance with Section 712.0, as amended.” Section 712.0 relates to Minnesota climate conditions. This provides consistent testing requirements and avoids redundant language that has already been established in another section.

4714.0724 RECREATIONAL VEHICLE SANITARY DISPOSAL STATION.

The proposed amendment adds this new section outlining the construction requirements of the sanitary disposal or “dump” stations which commonly exist at recreational vehicle parks, at campgrounds, gas stations, and highway rest stops. The dump station allows owners of recreational vehicles to empty the sewage holding tank. The stations typically have a source of water supply to wash any spilled sewage. There are public health concerns associated with these functions, and therefore the minimum construction requirements are necessary for preventing human contact with, and disease transmission from, feces and other sewage components and preventing backflow of sewage into the water supply system.

Section 724.1 Construction.

This section establishes the size of the minimum size of the concrete pad for the “dump” station and the pitched on the concrete pad to the center so proper drainage is possible to facilitate the cleaning while providing a self-closing, foot-operated hatch for a tight fit for the 4-inch drain inlet connecting to the sewer system for proper disposal of the sewage from RV holding tanks.

Section 724.2 Flushing Device.

Consistent with past and current practices in Minnesota, this section establishes a flushing device which is a handheld water supply hose secured to a post at a minimum required height to allow for cleaning while requiring proper backflow to protect the water supply system.

Lastly, signage is required to be posted adjacent to the dump station to clearly state that the use of the water from the handheld water supply is not safe for drinking or domestic use. This is necessary since the water supply downstream of a backflow preventer on the handheld device is now considered non-potable water piping and must clearly state so to the public.

4714.0801 INDIRECT WASTES.

³⁷ The Minnesota Pollution Control Agency regulates abandoned sewage disposal facilities in Minnesota Rules, Chapters 7080 and 7081.

Subpart 1. section 801.2.2 Walk-In Coolers

The proposed amendment adds to the beginning of the subsection, “Floor drains shall not be located inside walk-in coolers unless they are specifically required by the licensing authority. Where required,...” The UPC does not clarify when floor drains should or should not be used in walk-in coolers. The Board does not have statutory authority to regulate *when* floor drains are required in walk-in coolers. The Board has statutory authority to regulate only *how* they are installed when they are required. The amendment makes this clarification. The UPC language carried forward has minor grammatical amendments for clarity but no substantive changes to the installation of floor drains in walk-in coolers. It is reasonable and necessary to clarify when floor drains are allowed in walk-in coolers and to coordinate with licensing authorities of other state agencies.

Subpart 2. section 801.2.3 Food-Handling Fixtures

The proposed amendment changes the listed types of food-handling fixtures by deleting “food preparation sinks” and “sinks” and adding cooking ranges, cooling counters, compartments and storage or holding compartments. The additions are consistent with licensing regulations. The proposed amendment changes the minimum drain pipe size from ½ inch to ¾ inch and adds a trap requirement. A ¾ inch minimum pipe size is needed to provide a sufficient opening for the equipment discharge without clogging. The trap prevents insects or other living creatures from crawling into the food compartments. The amendments are reasonable and necessary because they clearly identify common equipment and fixtures that are in food establishments and establish a minimum pipe size that will properly drain the fixtures without adding significant cost to the fixture or installation.

Subpart 3. Section 801.3 Bar and Fountain Sink Traps

The proposed amendment deletes this section in its entirety. The UPC section provides an alternative discharge option involving an air gap or air break for sinks in bars, soda fountains or counters that have traps that cannot be vented. Sinks in a bar, soda fountain, or counter must be directly connected and vented properly for sanitation purpose and for consistency with other state agencies. When a conventional vent is not possible for these sinks, there are other venting options available in this code.³⁸

4714.0804 INDIRECT WASTE RECEPTORS.

Section 804.2 Domestic or Culinary Type Fixtures Prohibited as Receptors

The proposed amendment adds this subsection to clarify that sinks that are intended for domestic purposes or food preparation, including in commercial settings, must not receive any indirect waste piping. An exception allows domestic use dishwashers in residential settings are permitted to discharge into a sink, sink tailpiece or food-waste grinder if properly installed. The amendment is reasonable and necessary to prevent contamination of food in domestic and culinary plumbing fixtures.

4714.0813 SWIMMING POOLS.

³⁸ See UPC section 909.0 Special Venting for Island Fixtures and UPC section 910.0 Combination Waste and Vent Systems.

Section 813.1 General

The proposed amendment adds, “including water from scum gutter drains and pool deck drains” to this section to clarify that water from the pool gutters and deck drains must also discharge to the drainage system through an indirect connection. This is reasonable and necessary to prevent sewage back-ups into areas of the pool that would contaminate pool water and expose swimmers to contaminated water and unhealthy conditions.

4714.0814 CONDENSATE WASTES AND CONTROL.

Subpart 1. UPC section 814.1 Condensate Disposal, including Table 814.1

The proposed amendment deletes the reference to Table 814.1; and deletes the last sentence of the UPC paragraph that reads, “Condensate or wastewater shall not drain over a public way” because it is redundant with subpart 4 of this part. It is reasonable and necessary to delete references to tables no longer a part of the code and eliminate redundant requirements.

Subpart 2. Table 814.1 Minimum Condensate Pipe Size

The proposed amendment deletes Table 814.1, Minimum Condensate Pipe Size, the Minnesota Mechanical Code already regulates condensate pipe sizes and the Board does not have statutory authority to regulate condensate pipes sizes.³⁹ The proposed amendment is reasonable and necessary to avoid conflicting requirements between the two codes and to delete regulations that Board does not have statutory authority to promulgate.

Subpart 3. Section 814.2

The proposed amendment deletes this section because this section specifies condensate waste pipe sizes which is regulated by the Minnesota Mechanical Code. It is reasonable and necessary to delete this section to avoid conflict with another code and the Board does not have the statutory authority to regulate condensate waste pipe sizes.

Subpart 4. Section 814.3

The proposed amendment reorganizes the existing language, makes some additions and deletes one portion. The phrase “dry wells, leach pits” is deleted because MPCA regulates dry wells and leach pits. A new place to discharge to, “an exterior place of disposal approved by the Minnesota Pollution Control Agency” is added in its place. The proposed amendments reorganize the UPC requirements so language clearly indicates that condensate must discharge into a code approved receptor for receiving this waste and the added option for disposal on the exterior of the building when disposal methods and locations are approved by rules governed by MPCA. The proposed amendment adds to the requirement that condensate waste shall not drain over a public way, “or in areas causing a nuisance.” An example of an area “causing a nuisance” is discharging into a swale, which might enter the neighbor’s property and cause unintended erosion, cracking of walk-ways or creating slippery conditions in other hard surfaces. Another example is discharging to the ground surface where the discharge overflows into a public walkway. The proposed amendments are necessary and reasonable because the rule is clearer and coordinated with existing rules of other state agencies.

³⁹ Condensate pipe sizing is regulated in section 307 of the 2012 International Mechanical Code, which is incorporated by reference in Minnesota Rules, chapter 1346, the Minnesota Mechanical Code.

4714.0902 VENTS NOT REQUIRED.

Section 902.2 Bars, Soda Fountains, and Counter

The proposed amendment deletes this section because all sinks, including bar, soda fountain and counter sinks, must be directly connected, trapped and vented. This section offers an exception that does not align with food licensing requirements of other state agencies that regulate commercial food businesses because it does not adequately protect public health. This change is consistent with the proposed amendments to section 801.3 for proper sanitation and consistency with the food licensing authority's requirements.

4714.0903 MATERIALS.

Section 903.1 Applicable Standards

The proposed amendment rewords the UPC requirements in the affirmative rather than negative to be clearer and deletes the reference to Chapter 15 because Chapter 15 is not proposed for adoption in this code.⁴⁰

4714.0905 VENT PIPE GRADES AND CONNECTIONS.

Section 905.3 Vent Pipe Rise

The proposed amendment requires these vent pipe rise requirements unless specifically permitted elsewhere in the plumbing code. The UPC language allows deviation from this section if "structural conditions" prohibit this vent pipe rise. The proposed amendment also deletes the language that allows plumbing vents to be installed less than 6 inches above the flood-level rim of a fixture is deleted because proper venting is important to prevent siphoning of the traps and sewer gas to escape to the environment, which requires at least 6 inches above the flood-level rim of a fixture. The proposed amendment is reasonable and necessary because public health and safety is increased without being overly burdensome.

4714.0906 VENT TERMINATION.

Subpart 1, Section 906.1 Roof Termination

The proposed amendment changes the UPC requirement that vent pipes and stacks terminate "not less than 6 inches (152 mm) above the roof nor less than 1 foot (305 mm) from a vertical surface" to "not less than 12 inches (305 mm) above the roof." It is common to have snow load higher than 6 inches on the roof in a typical winter in Minnesota which may block the opening of the vent pipe and cause improper functioning of the plumbing system including possible exposure to sewer gas. Because of the change from 6 inches to 12 inches, the UPC language "not less than 1 foot (305 mm) from a vertical surface" is no longer necessary. The proposed amendment is reasonable and necessary because it addresses Minnesota winter conditions without substantially increasing the burden.

Subpart 2 Section 906.3 Use of Roof

⁴⁰ Chapter 15, Firestop Protection, is not adopted into this code because the Board does not have statutory authority to adopt firestop protection rules.

The proposed amendment changes the requirement for vent pipes to terminate above roofs from 6 inches to 12 inches to align with the proposed amendment to section 906.1 relating to Minnesota winter conditions. In addition, the reference to “fire wall” is deleted because this term might cause confusion and result in vent designs that terminate through a side wall instead of through the roof, which is not allowed. There are minor changes for grammatical clarity. The proposed amendment is necessary and reasonable because it economically accommodates Minnesota winter conditions.

Subpart 3 Section 906.7

The proposed amendment deletes the conditional UPC language specifying this section applies only where frost or snow closure is likely. Because frost or snow closure is likely in Minnesota, the conditional language is deleted. The proposed amendment changes the requirement that vent pipes “terminate not less than 10 inches” to “not less than 12 inches” to be consistent with the proposed amendments in sections 906.1 and 906.3 relating Minnesota winter conditions. The proposed amendment clarifies with grammatical changes that the vent terminal minimum size is 2 inches in diameter. The proposed amendment is reasonable and necessary because temperatures in Minnesota winters are consistently below zero degrees Fahrenheit. The proposed amendment accommodates Minnesota winters by removing any contingency as to when this requirement must be followed and does not add much cost to the UPC requirement as extending a pipe from 10 inches to 12 inches is not costly.

4714.1001 TRAPS REQUIRED.

Section 1001.1 Where Required

The proposed amendment clarifies that a laundry tub is an acceptable receptor for waste discharge from an adjacent clothes washer. The UPC language is unclear and likely to be interpreted to mean that a trap of a laundry tub is permitted to receive discharge from a clothes washer. It is not clear that the waste discharge goes through the laundry tub and not directly into the drain pipe. A direct physical connection from the clothes washer into the trap of the laundry tub would siphon dirty waste from the laundry tub or its trap during the clothes washer spinning cycle. The proposed amendment reasonably clarifies the requirement.

4714.1007 TRAP SEAL PROTECTION.

Section 1007

The proposed amendment deletes this section in its entirety. This section requires a trap seal primer on floor drains or similar traps directly connected to the drainage system and subject to infrequent use. This requirement adds cost to the plumbing project, requires long-term maintenance, and involves a mechanical device which is subject to failure. The benefit is minimal. The existing Minnesota Plumbing code does not require a trap primer. It is reasonable to delete a requirement that offers little benefit but adds cost and maintenance.

4714.1008 BUILDING TRAPS.

Section 1008

The proposed amendment deletes this section in its entirety. This section requires building traps when the Authority Having Jurisdiction requires them and provides requirements for the

traps when they are required. Building traps are in addition to other traps and venting required for individual plumbing fixtures. Historically, building traps were needed to prevent sewer gas from entering into the storm drainage system in buildings served by combined storm and sanitary sewers. Combined sewers (containing storm and sanitary) are no longer a standard construction method and are extinct or nearly extinct. Installation of a building trap may negatively affect the plumbing system by interfering with the flow of air and sewage in the system. The proposed amendment is necessary and reasonable because it deletes a requirement that is not applicable in Minnesota and results in safer conditions with less cost.

4714.1009 INDUSTRIAL INTERCEPTORS (CLARIFIERS) AND SEPARATORS.

Section 1009.2 Where Required

The proposed amendment deletes the requirement that the Authority Having Jurisdiction must approve the size, type and location of each interceptor (clarifier) and separator. Instead of approval for each unit, the proposed amendment states that all interceptors (clarifiers) and separators are subject to chapter 10 with an exception. The exception is for units that are engineered and manufactured, with documentation from the manufacturer and the project registered professional engineer, for specific projects and approved by the Authority Having Jurisdiction. It is reasonable to require all units comply with this chapter and require approval from the Authority Having Jurisdiction only for special units rather than every unit, which would be unnecessarily burdensome. The formatting of the exception conveys the information more clearly than the single paragraph in the UPC.

The UPC language that reads, “Except where otherwise specifically permitted, no wastes other than those requiring treatment or separation shall be discharged into an interceptor (clarifier).” The proposed amendment largely keeps this language but relocates it to be after the proposed exception, reorganizes for grammatical clarity, adds “or separator” to be included in this scope, and deletes “except where otherwise specifically permitted.” As a result of the deletion, there is no exception to what wastes can be discharged into an interceptor (clarifier) or separator.

4714.1010 SLAUGHTERHOUSES, PACKING ESTABLISHMENTS, ETC.

Section 1010 Slaughterhouses.

This section is specific to slaughterhouses, packing establishments and other establishments that process animals, which may produce unwanted wastes from processing of animals that will clog the drainage system. The proposed amendment provides more specific requirements than the UPC language. The UPC lists specific types of animal product processing establishments and requires them to be connected to and drain into an approved grease interceptor (clarifier). The proposed amendment refers generally to slaughtering and dressing room drains and requires separators or interceptors that are approved by the administrative authority. The proposed amendment provides a description of the purpose of the separators or interceptors, “prevent the discharge into the drainage system of feathers, entrails, or other material likely to clog the drainage system.”

4714.1014 GREASE INTERCEPTORS.

Section 1014.3.7 Abandoned Gravity Grease Interceptors.

The UPC section requires all abandoned grease interceptors be pumped and filled as required for abandoned sewers and sewage disposal facilities in section 722.0. The proposed amendment above deletes section 722.0. The proposed amendment to this section also requires abandoned gravity grease interceptors be pumped and filled but “as required by the Authority Having Jurisdiction.” It is reasonable to delete a reference to a section that is proposed for deletion, clarify that this applies to gravity grease interceptors because headings are not enforceable and to refer to an entity with jurisdiction to determine when and how abandoned gravity grease interceptors are pumped and filled.

4714.1101 GENERAL.

Subpart 1. Section 1101.1 Where Required.

The proposed amendment adds a sentence that reads, “In no case shall a building owner or designer knowingly or intentionally allow water from roofs or any building roof drainage to flow onto the public sidewalk.” The amendment prohibits water from building roofs from being discharged onto public sidewalks as water on sidewalks is a nuisance to the public, especially when there are concerns of freezing and thawing in Minnesota climate conditions, creating unsafe conditions for walking and safe egress from buildings. This includes discharges from primary and secondary roof drainage system.

Subpart 2. Section 1101.2 Storm Water Drainage to Sanitary Sewer Prohibited.

The proposed amendment adds an allowance for storm water to drain into sanitary drainage when “approved by the municipal sewer authority or stated elsewhere in this code.” In cases such as open parking ramps or exterior drains in washing areas, the storm water might be contaminated and need treatment. Discharge to a sanitary sewer undergoes treatment where typical storm water drainage does not. Specific approval from the sewer authority is necessary and emphasized to ensure that the storm water must connect to sanitary sewer for treatment. Provisions must be made to prevent flooding of the sanitary sewer system if required by the sewer authority and the sanitary sewer system is properly sized to handle the additional storm water load.

Subpart 3. Section 1101.3 Material Uses.

The proposed amendment makes one grammatical change for clarity and deletes firestop protection references and regulations because the Board does not have statutory authority to regulate firestop protection. Firestop protection and flame spread materials are governed by the State Fire Code and the Minnesota Building Code.

Subpart 4 Section 1101.11 Roof Drainage.

Section 1101.11.1 Primary Roof Drainage. The proposed amendment reorganizes the language for clarity, deletes references to gutters and changes the circumstances and calculation for sizing the roof drainage system to be based on a minimum rate of rainfall of four inches per hour. References to gutters are deleted because the Board does not have statutory authority to regulate gutters. As with other references to gutters in the UPC, these are deleted here because they are regulated by the Minnesota Building Code. The roof drainage system size calculation is changed from “60 minutes duration and 100 year return period” and the reference to Table D in Appendix D because Appendix D is not adopted into this code and the proposed calculation is a clearer method of determining the adequate drainage system size for storm drainage in Minnesota. The exception language allowing the Authority Having Jurisdiction to require a different size

calculation is deleted. Lastly, the proposed rule clarifies that the coordination with the structural design and pitch of the roof must be done in accordance with section 1106.

Section 1101.11.2 Secondary Drainage. The proposed amendment refers to Minnesota Rules, chapter 1305, the Minnesota Building Code, which administers the requirements of secondary roof drainage systems including scuppers for all buildings.

Subpart 5 Section 1101.11.2.1, 1101.11.2.2, 1101.11.2.2 (A), and 1101.11.2.2 (B).

Subsections 1101.11.2.1, 1101.11.2.2, 1101.11.2.2 (A), and 1101.11.2.2 (B) are all requirements established by the Minnesota Building Code and therefore are necessary to be deleted from this Code.

4714.1106 SIZE OF LEADERS, CONDUCTORS, AND STORM DRAINS.

Section 1106.3 Reduction in size prohibited.

The proposed amendment requires roof drainage systems and storm drain piping must not reduce in size in the direction of flow. If piping reduces in size in the direction of flow, debris will collect and cause obstructed flow. Obstructed flow will likely cause a clog and rainwater will become backed up onto the roof, which compromises the building structure because it was not designed to hold the weight of backed up rainwater. This is necessary and reasonable because it prevents obstruction of flow including at changes in direction from horizontal to vertical without adding burden or cost and reduces pipe maintenance and system cleaning needs.

4714.1108 CONTROLLED-FLOW ROOF DRAINAGE.

1108.1 Application.

This section regulates sizing the storm drainage system. It allows sizing to be based on controlled flow and storage of the storm water on the roof provided thirteen conditions are met. The proposed amendment makes minor grammatical changes for clarity and in item (7), changes the design roof live load from “not less than 30 lb/ft²” to “not less than 40 lb/ft².” The current Plumbing Code requires not less than 40 lb/ft² and is based on a minimum rate of rainfall of four inches per hour consistent with Section 1101.11.1, as amended.

The proposed amendment also deletes the remainder of item (7) language that reads, “...to provide a safety factor exceeding the 15 lb/ft² (73 kg/m²) represented by the depth of water stored on the roof in accordance with Table 1108.1(2).” That language is deleted because it explains the calculation for determining the “not less than 30 lb/ft²” requirement which has been changed to 40 lb/ft².

The proposed amendment is reasonable and necessary because it provides Minnesota-specific design conditions for building protection.

4714.1109 TESTING.

Subpart 1 Section 1109.1

The proposed amendment replaces references to Section 1109.2.1 or Section 1109.2.2 with a reference to section 712, and adds “except as provided in section 1109.2.” Section 712, as

amended establishes all testing requirements that are necessary for Minnesota-specific conditions. Section 1109.2 provides specific exceptions to section 712 testing. It is necessary to coordinate testing requirements to provide consistency and avoid redundant requirements as well as future revisions that may create conflicting language.

The proposed amendment adds a sentence requiring an air test for any building storm sewer that passes through contaminated soils or contaminated water in accordance with section 712.3. Any storm sewer that passes through contaminated soils or contaminated waters is at risk of infiltration of contaminants into the sewer and possibly entering into waters of the state (lakes, ponds, streams, etc.). Therefore, it is reasonable to subject such storm sewers to an air test to ensure the sewer is air-tight to prevent contamination.

Subpart 2 Section 1109.2. Exceptions

The proposed amendment replaces the UPC section and subsections with exceptions to testing requirement in Section 1109.1. UPC Section 1109.2 is replaced with just a heading. The two proposed subsections contain language from the existing Minnesota Plumbing Code. The first subsection, 1109.2.1, provides specific exceptions when testing is not required for building storm drainage systems.

The proposed amendment does not require testing for any outside leaders, perforated or open drain tiles, or portions of storm drainage system and storm sewers that are located more than ten feet from buried water lines, and more than 50 feet from water wells. These exceptions are reasonable because perforated pipes are intended for groundwater removal and storm drainage systems and storm sewers carry rainwater and other contaminants that enter into the storm sewers through rainwater. Testing is not necessary in these specific, limited situations because the risks and contaminants carried in these situations do not pose a threat to public health like sanitary sewers (which require testing).

The second subsection, 1109.2.2, offers an alternative testing option for building storm drainage systems and sewers in lieu of the test in section 712. The proposed amendment offers the hydrostatic test method from the City Engineers Association of Minnesota, 2013 edition as a testing option. It is reasonable to adopt the hydrostatic test method to test building storm sewers because it is a commonly used method in the utility industry and storm sewer sizes might be have too large a diameter that renders the tests prescribed in section 712 impracticable or unsafe.

4714.1110 SIPHONIC ROOF DRAINAGE SYSTEM.

The proposed amendment adds this section to establish minimum requirements for engineered siphonic roof drainage systems. The language is largely taken from the existing Minnesota Plumbing Code. The requirements in this section ensure proper design and installation of the system.

Section 1110.1 General Requirements

This proposed section provides the general requirements for siphonic roof drainage systems. Siphonic roof drainage systems must be engineered systems that meet design criteria and special consideration for suitability for each construction project. Because of these unique

parameters and criteria, engineered siphonic roof drainage systems may be used for building roof drainage only when approved by the administrative authority.

Section 1110.2 Design Criteria

This proposed section establishes the minimum requirements and adopts standards that must be met in the design of siphonic roof drainage systems. The first criteria is that a registered professional engineer, licensed by the State of Minnesota, must design and certify the siphonic roof drainage system. Siphonic roof drainage systems are engineered systems and the designs require a higher level of technical understanding by the designer than conventional roof drainage systems prescribed in section 1106. The proper design of the building roof drain system is critical to protect against roof collapse and to preserve public safety.

1110.2.1 Sizing

This proposed subsection establishes the specific minimum requirement of four inches per hour rainfall rate in the design of a siphonic roof drainage system. This rate is consistent with the requirements proposed for all building roof drainage systems in this code.

1110.2.2 Design

This proposed subsection specifies that the siphonic drainage system design must meet ASPE Standard 45 (“ASPE 45”), Siphonic Roof Drainage. The standard establishes design criteria, parameters, materials, methods, and performance specifications for siphonic roof drainage systems. In addition, ASPE 45 describes the basis for the design and manufacturer of siphonic roof drain products and procedures. For example, all materials must be installed in accordance with referenced standard in ASPE 45 under which materials are acceptable and approved, and in accordance with manufacturers’ written instructions for siphonic roof drainage system. Emphasis is made that all manufacturer design software used in the design and sizing of the system must meet ASPE Standard 45. Because of the complexities of the siphonic design calculation, it is important for the manufacturers of these roof drains to use an established and proven design software program that is based on ASPE Standard 45. Assurance of the of the manufacturer’s design software meets ASPE Standard 45 is necessary for accurate and consistent designs and calculations among the different manufacturers of roof drains. ,

1110.2.3 Roof drain bodies

This proposed subsection requires roof drain bodies to meet ASME Standard A112.6.9, Siphonic Roof Drains. ASME Standard A112.6.9 establishes minimum design, testing, and performance standards of the roof drain bodies for the proper functioning of siphonic roof drainage systems.

1110.2.4 Water accumulation.

The proposed subsection requires roofs designed for water accumulation be designed for the maximum possible water accumulation according to Section 1108.1(7), as amended, and chapter 1305, the Minnesota Building Code. This requirement is necessary to prevent roof collapse when a roof is designed for water accumulation to control the flow from the roofs beyond the minimum required depth for the priming of the siphonic roof drains.

1110.2.5 Pipe size and cleanouts.

The proposed subsection sets a minimum pipe size of 1-1/2 inch and requires all pipe sizes and cleanouts in the drainage system be designed and installed according to ASPE Standard 45. ASPE Standard 45 provides plumbing standards for siphonic drainage systems. A minimum pipe size of 1-1/2 inch gives the registered professional engineer flexibility while maintaining the scouring velocity properties of the siphonic pipe work. The 1-1/2 inch pipe is the smallest size used in ASPE 45 for sizing and configuration in the designs of siphonic roof drainage systems for siphonic draining action and is specified in this rule section to ensure smaller sizes are not used in any design of siphonic roof drainage system.

1110.2.6 Horizontal pipes.

The proposed subsection prohibits any reduction in horizontal pipe size in the direction of flow because such a reduction will lead to clogging and interrupt proper pipe flow. This is necessary and reasonable because debris and rainwater might collect at the point of reduction. This requirement does not have any negative affect on the design of siphonic roof drainage systems, does not add significant cost, and minimizes maintenance and cleaning needs of the system.

1110.2.7 Plans and specifications.

This proposed subpart establishes requirements for identification of plans and specifications to indicate the siphonic roof drainage system as the engineered method used for the building roof drain design. It is critical there is a clear record of the method used in sizing the building roof drainage system because a siphonic roof drainage is a specialized engineered system. This is necessary because code officials, plan reviewers, and owners must consider the hydraulics related to the siphonic roof drainage system for future modifications or re-design to ensure that design parameters are safely maintained by the registered professional engineer.

1110.2.8 Markings.

The proposed subsection requires markings of all piping at each floor, walls, and approved intervals as necessary. Roof drain markings must meet the requirements in ASME A112.6.9, which is also referenced in subsection 1110.2.3. Markings are necessary for inspections, maintenance, and replacements to maintain the proper functioning and condition of this type of system after construction. Owners and maintenance personnel must be able to clearly identify the installed system to avoid improper maintenance or modifications.

1110.2.9 Transition locations.

The proposed subsection requires the transition location from siphonic to gravity be determined by the registered professional engineer and approved by the administrative authority. Designing a reduction in velocity at the transition location of siphonic to gravity flow protects the building drainage system and ultimately the property in general. The siphonic roof drainage, by design, is primed and fully pressurized in order to function and the transition location is the relief point of the system. The gravity system receiving the siphonic system discharge must be able to handle the higher flow capacities and velocities from the siphonic system. At this transition location, the siphonic system turns into gravity flow so air is mixed into the rainwater at this point. Therefore, the transition location from siphonic to gravity flow must be adequately vented so the system does not become airborne. The subsection also requires gravity storm drainage sizing to comply with the gravity sizing requirements of section 1106.0. This requirement is necessary and reasonable because the system needs a proper pressure relief location to protect the roof drainage system.

1110.2.10 Required submissions.

This proposed subsection requires plans, specifications, and calculations for the siphonic roof drainage system be signed and certified by a registered professional engineer and submitted to the administrative authority for review and approval. This subsection also specifies that extreme calculations, as compared to averaged calculations, must be included in the design calculations of the system in the submittal to the administrative authority for review and approval. This requirement is necessary and reasonable because the role of the registered professional engineer is critical to the safe design of siphonic roof drainage systems and average calculations can be misleading. Submitting signed certification is not overly burdensome, particularly when compared with the safety benefit a safe system offers and extreme calculations offer accurate, useful information while not being any more burdensome than average calculations.

Section 1110.3 Proof of Suitability

The proposed section and subsections address requirements for testing, inspections, and certification of the siphonic roof drainage system that must be submitted to the administrative authority prior to the issuance of the certificate of occupancy. Engineered siphonic roof drainage systems must demonstrate proof of suitability upon completion of the installation by meeting testing requirements in accordance with ASPE Standard 45 to verify system integrity. The testing demonstrates that the system functions under all pressures when tested to worst-case siphonic conditions in the design.

Also, registered professional engineers are required to physically perform a final field inspection and provide written certification that the system has been installed in accordance with the design, plans, specifications, and any field modifications. This requirement is necessary because a siphonic roof drainage system is a complex engineered system that requires special expertise and an understanding of hydraulics, proper pipe configuration for balancing the system, and precise installation, to ensure the correct application of the system; field certification by the registered professional engineer is a reasonable method to ensure safe design and testing is done.

4714.1701 GENERAL.

1701.1 Applicability.

The proposed amendment modifies the UPC wording to clarify that rainwater is considered nonpotable and that this chapter applies to rainwater collected for use in nonpotable applications. The proposed amendment adds a reference to UPC section 1702.1 to clarify the nonpotable applications to which this chapter applies.

1701.1.1 Irrigation.

The proposed amendment adds this subsection to clarify that rainwater catchment systems contained entirely outside of a building and used exclusively for outdoor lawn irrigation, whether surface or subsurface, are not regulated by this chapter. This language does not prohibit the use of captured rainwater for irrigation but clarifies they are not regulated here.

1701.1.2 Combination Systems.

The proposed amendment adds this subsection to address combination systems that are used for both lawn irrigation (excluded in 1701.1.1) and approved nonpotable applications in 1702.1. All portions or components of the rainwater catchment system used for approved nonpotable applications shall meet the requirements of this chapter. Proper backflow protection or

an air gap is required to separate the nonpotable water distribution system from the irrigation system and protect the nonpotable water distribution system from possible contamination. The irrigation system will meet the same backflow protection requirements as irrigation systems supplied from a potable water distribution system. The portion of the irrigation system downstream of a properly installed backflow protection assembly, in accordance with Chapter 6, as amended, and outside of the building is not regulated by this chapter.

4714.1702 NONPOTABLE RAINWATER CATCHMENT SYSTEMS.

1702.1 General.

The proposed amendment removes the term “irrigation” because this code does not apply to irrigation systems downstream of proper backflow protection. Vehicle washing facilities are increasingly using captured rainwater. The proposed amendment specifically lists vehicle washing facilities to clarify they are subject to this chapter. The term “similar” has replaced the term “other” to clarify and narrow the scope of acceptable uses for captured rainwater. The commissioner of Labor and Industry has authority to approve the “similar” uses in order to provide consistency throughout the state. The proposed amendment is needed to identify the common applications which may be approved.

1702.2 Plumbing Plan Submission.

The proposed amendment references Minnesota Rules, part 1300.0215, subpart 6, of the Minnesota State Building Code, which regulates plumbing plans and specification approval.⁴¹ Part 1300.0215, subpart 6, provides clearer requirements than the UPC language. The UPC section, if not amended, would be redundant or in conflict with part 1300.0215. The proposed amendment reasonably regulates plan and specification approval within existing Minnesota rules.

1702.4 Connections to Potable or Reclaimed (Recycled) Water Systems.

This section addresses the acceptable means of supplying makeup water to a rainwater catchment system and backflow protection. The proposed amendment adds that an automatic makeup water system must be installed as backup in the event that rainfall is inadequate to supply the system or in the case of system failure. The proposed amendment ensures proper and continuous operation of the rainwater catchment system.

1702.5 Initial Cross-Connection Test.

This section requires an initial cross-connection test of rainwater catchment systems to ensure the potable water systems has not been compromised. The proposed amendment does not substantially change the requirement. The proposed amendment replaces “installer” with “plumbing contractor” to clarify who must perform the cross-connection test. The proposed amendment deletes “by the Authority Having Jurisdiction” from the last sentence because the reference is redundant.

1702.7 Rainwater Catchment System Materials.

This section states the subsections that contain specific material requirements for rainwater catchment systems. There is no proposed amendment to this section but it is included in the rule draft for context of the following amendments.

⁴¹ Click for a link to [Minnesota Rules, part 1300.0215](#). Plumbing permits are statutorily required in [Minnesota Statutes, section 326B.49, subdivision 3](#).

1702.7.1 Water Supply and Distribution Materials.

The proposed amendment does not substantively change this section. The proposed amendment adds a reference to “Chapter 6, as amended in this code” to specify where water supply and distribution materials are regulated and to indicate that UPC chapter 6 is amended in this code.

1702.7.2 Rainwater Catchment System Drainage Materials.

The proposed amendment does not substantively change this section. The proposed amendment adds a reference to “Chapter 11, as amended in this code” to specify where storm drainage is regulated and to indicate that the UPC chapter 11 is amended in this code.

1702.7.3 Storage Tanks.

The proposed amendment adds, “as amended in this code” after the reference to Section 1702.9.5 to clarify that the amended version of section 1702.9.5 should be followed.

1702.7.4 Collection Surfaces.

The proposed amendment does not substantively change this section. There are no amendments to the requirement but rather a grammatical correction to the section heading. Specifically, the term “Collections” is amended to the singular form.

1702.9.3 Collection Surfaces.

This section states that rainwater collected only from roof surfaces can be used for a rainwater catchment system. To clarify this point, the section lists three areas where rainwater cannot be collected for such catchment systems. The proposed amendment adds one more item, a catchall item that reads, “similar nonroof surfaces.” Although rainwater can be collected from various surfaces such as the prohibited areas listed in the section, water collected from the prohibited areas might be contaminated in a way the rainwater catchment systems is not designed to handle safely. Because all surfaces that collect rainwater cannot be listed, the additional language was needed to clarify that rainwater from nonroof locations shall not be used in rainwater collection systems. The proposed additional item is reasonably broad to include surfaces intended but not explicitly listed yet specific enough to be clear (“nonroof”).

1702.9.3.1 Prohibited Discharges.

The proposed amendment adds “condensate, and other waste disposal” to the items that shall not discharge onto roof surfaces that collect rainwater and clarifies that the prohibited discharge should not feed into a rainwater for rainwater catchment systems. The chemical composition of water from condensate and other waste discharged to roof surfaces is often unknown and could contaminate collected rainwater. The proposed amendment reasonably prohibits such discharge onto roof surfaces that collect rainwater for rainwater catchment systems.

1702.9.4 Minimum Water Quality.

The proposed amendment modifies language for consistency throughout this chapter and introduces Table 1702.9.4, which contains the minimum water quality limits for rainwater catchment systems, in lieu of the narrative provided in the UPC. The UPC language replaced by the table reference allows the Authority Having Jurisdiction to determine the minimum required water quality standard which could lead to inconsistency throughout the state. This code does not regulate water quality requirements for irrigation systems, whether subsurface or non-sprinkled.

Table 1702.9.4.

The proposed amendment adds this table to section 1702.9.4. The main concern when using rainwater for nonpotable applications is the quality of the water and whether it will be safe for its intended use. After consultation with various state departments, these minimum water quality standards and indicators are established to ensure only safe rainwater is used in rainwater catchment systems.⁴² The limits in this table have been recommended by the Minnesota Department of Health, Noncommunity Public Water Supply Unit, Duluth, and were based on a review of current guidelines and recommendations (e.g. NSF Standard 350, EPA Guidelines for Water Reuse, and others), and general knowledge of surface water treatment and water quality indicators, and the Minnesota Department of Labor and Industry, Plan Review Division.⁴³ Turbidity is measured in Nephelometric Turbidity Unit (NTU), which is the standard unit of measurement for turbidity. E. coli is measured in Most Probable Number per 100 milliliters of water (MPN/100 mL), which is the standard unit of measurement for E. coli.

1702.9.5.1 Construction.

This section regulates storage tank construction. The UPC refers to “approved applicable standards.” Because there are no such standards specific to rainwater storage tanks, the proposed amendment adds a general, performance-based requirement that the materials be suitable for rainwater storage. It is reasonable to regulate materials and construction generally to ensure safe storage of rainwater. It is reasonable to address the suitability of rainwater storage tanks and not require an exact standard be met given there are none. On a practical level, verification of storage tank suitability meeting the performance-based standards and intent of this section will be accomplished during the plan review process. Although rainwater storage tank standards are not yet established, approved potable water storage tanks, for which there are established standards, would likely satisfy this requirement.

1702.9.5.6(A) Animals and Insects.

The proposed amendment does not substantively change the requirement. Rather, the proposed amendment adds specific requirements to better define tank openings, by adding “and piping system,” and provides a minimum screen aperture for covering the openings. This description reasonably protects the rainwater catchment system from contamination from animals and insects.

1702.9.5.8 Storage Tank Venting.

The proposed amendment adds this subsection. Rainwater storage tanks must remain at atmospheric pressure to avoid a positive or negative pressure forming inside the storage tank which could impede proper operation. The proposed amendment prevents the installation of unvented tanks or a vent small than 1½ inches in diameter which is consistent with the receiving tank vent requirement in 710.10.

1702.9.6 Pumps.

⁴² The Board consulted with Minnesota Department of Labor and Industry, Minnesota Pollution Control Agency, Minnesota Department of Natural Resources and Minnesota Department of Health.

⁴³ The MDH Noncommunity Public Water Supply Unit consists of MDH staff, including field staff and compliance staff, and is responsible for assuring the compliance of noncommunity water systems with the federal Safe Drinking Water Act. See www.health.state.mn.us/divs/eh/water/ncom/.

The proposed amendment does not substantively change the requirement. The proposed requirement clarifies that the required pressure-reducing valve must be listed. When excessive pressure is present, proper performance of a pressure-reducing valve is needed for the continuous operation of the rainwater catchment water distribution system. It is reasonable to require all pressure reducing valves installed, be listed to a product standard.

1702.9.7 Roof Drains.

The proposed amendment replaces “drains, conductors, leaders, and gutters shall” with “drain systems shall.” The Board does not have statutory authority to regulate gutters but does have authority to regulate roof drain systems. The proposed amendment amends the section so that the Board can properly promulgate the rule part as part of the plumbing code.

The proposed amendment also references chapter 11 of the UPC, as amended, to replace the original UPC language that refers to “this code.” Chapter 11 contains the specific design and installation requirements applicable to storm drainage and roof drains. The amendment is needed to clarify there have been amendments made to Chapter 11, which may be directly related to this section. When secondary roof drainage systems activate and supply rainwater catchment systems, it is difficult to determine if the primary or secondary drainage system is supplying rainwater. A working alarm on the secondary system to indicate flow has been detected is a reasonable requirement to provide notice that the primary system is plugged or otherwise incapable of sufficiently draining the roof area.

1702.9.8 Water Quality Devices and Equipment.

The proposed amendment replaces the general UPC requirement for listed or labeled equipment with specific standards and characteristics. Instead of referring to just the function of the equipment (“to treat rainwater to maintain the minimum water quality requirements determined by the Authority Having Jurisdiction”), the proposed amendment clarifies that the system shall include filtration and disinfection to maintain the water quality requirements in Table 1702.9.4, a 5-micron absolute filter and a 0.5-log inactivation of viruses. The proposed amendment also adds the requirement that a Minnesota registered professional engineer design, size, document and select devices and equipment used in the rainwater catchment system. Utilizing a qualified individual will ensure the system is sufficient to satisfy its intended use and meet the minimum quality requirements.

Sections 1702.9.11 and 1702.9.12.

The proposed amendment deletes subsection 1702.9.11 because the proposed amendment to section 1702.9.8 requires filters in the rainwater catchment system, which is redundant with the filter requirement here (“for rainwater supplied to water closets, urinals, trap primers, and drip irrigation system”). The filter required in 1702.9.11, “not larger than 100 microns) is in direct conflict with the more stringent requirements in Table 1702.9.4 and the filter requirement in the proposed amendment to 1702.9.8, “a 5-micron absolute filter” and “0.5-log inactivation of viruses.” The proposed amendment deletes subsection 1702.9.12, “Roof Gutters.” The Plumbing Board published a Notice of Final Interpretation on November 21, 2011, stating that a gutter installed entirely outside of a building is not regulated by the plumbing code.

1702.10.1 Commercial, Industrial, and Institutional Restroom Signs.

This subsection regulates signage to inform individuals using restrooms that nonpotable rainwater is used in the restroom. The proposed amendment replaces the UPC language that

authorizes the Authority Having Jurisdiction to determine the number and location of signs with language that describes the location of the signs. It is not necessary for the Authority Having Jurisdiction to specifically determine the number of signs because the requirement regarding sign location will indirectly regulate the number of signs. The proposed amendment expands the options of required sign text from one, “TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS AND URINALS” to four variations of that text. The proposed amendment adds 1702.10.1 (A) through 1702.10.1(D) where the additional text options are listed:(A) “TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS AND URINALS”; (B) “TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS”; (C) “TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH URINALS”; and (D) “TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO **.” Option D is open-ended to allow appropriate sign text for other rainwater usage not listed in A through C.

1702.11.2 Cross-Connection Inspection and Testing.

The first proposed amendment to this section is deletion of “Annual” before “Cross-Connection” in the section heading. Because this section applies to the initial inspection as well as the annual inspections, the word “Annual” is proposed for deletion to avoid confusion. The second proposed amendment to this section adds the words “water system” after “potable” to clarify that the potable water system and the rainwater catchment water system are two different systems. The original UPC language is grammatically ambiguous; the proposed amendment clarifies the intended meaning.

1702.11.2.1 Visual System Inspection.

This section specifies what will be visually inspected initially and annually before a cross-connection test. The proposed amendment adds “and annually thereafter” to clarify that the visual inspection should occur not just initially but also annually. The UPC language does not clearly convey the annual visual inspection requirement except in the heading and narrative of 1702.11.2. The proposed amendment deletes the language that states the Authority Having Jurisdiction “and other authorities having jurisdiction” will conduct the dual system inspection because Table 1702.12, “Minimum Alternate Water Source Testing, Inspection, and Maintenance Frequency” addresses who will perform the cross-connection inspection. The proposed amendment adds, “inspected for visible cross-connections, proper operation, and damage” to replace “checked” in the UPC. The proposed amendment clarifies what it means to “check” the equipment listed. The proposed amendments coincide with the requirements in Table 1702.12, “Minimum Alternate Water Source Testing, Inspection, and Maintenance Frequency.” The proposed amendments clarify what is required. This section clarifies the visual inspection will be conducted annually and removes unneeded language. A visual system inspection must be conducted annually, preferably and the start of annual usage. An inspection by the Authority Having Jurisdiction is already required to be performed under the requirements covered in the plan review and permitting process.⁴⁴

1702.11.2.2 Cross-Connection Test.

The proposed amendment replaces “applicant” with “plumbing contractor” to clarify who will conduct the cross-connection test. “Plumbing contractor” is a term already used in Minnesota

⁴⁴ See section 1702.11.1, as amended.

statutes and rules. It is not clear who the “applicant” is as it is first used in chapter 1 of the UPC, which is not adopted into this code. The proposed amendments to the cross-connection test procedure clarify the requirements by aligning terms and language used, clarify parameters, and make grammatical corrections. The proposed amendments do not substantively change the requirements or process in this section. It is reasonable to require that a plumber contractor, having the knowledge and experience in water distribution systems and related equipment, perform the test. The proposed amendments are reasonable and needed because they clarify the intent of the UPC language and add consistency to the language.

1702.11.2.3 Discovery of Cross-Connection.

This section is included in the rule draft within the context of the surrounding subparts that are amended. There is a minor grammatical correction to item (1) where an unnecessary comma is deleted.

1702.11.2.4 Inspection.

The proposed amendment removes the word “Annual” from the section heading and sets a defined length of time between cross-connection tests. Visual inspections must occur annually and cross-connection testing is required every five years. The original UPC language requires visual inspection annually but also requires cross-connection testing annually “unless site conditions do not require it” but in “no event shall the test occur less than once in 4 years.” The UPC language is confusing and ambiguous because there are no parameters describing what “site conditions” would render annual inspections unnecessary and quadrennial testing sufficient. The existing Minnesota Plumbing Code requires rebuilding of a reduced pressure zone backflow prevention assembly every five years.⁴⁵ Testing every five years is reasonable because it is in addition to annual visual inspections and balances the expense of cross-connection testing and public water safety.

1702.12 Maintenance and Inspection.

The proposed amendment adds section 1702.12, including Table 1702.12, and subsections 1702.12.1 through 1702.12.3. The added section, subsections and table provide specific requirements for regularly scheduled maintenance on the system, inspections and testing. They further define the requirements to maintain a maintenance log and stipulate the individual responsible for the system.

1702.12.1 Frequency.

This proposed subsection references Table 1702.12 and requires rainwater catchment systems and components be inspected and maintained, at a minimum, in accordance with the table. Manufacturers of equipment used in rainwater catchment systems may require more frequent inspection and maintenance of the equipment than the schedule in Table 1702.12. It is reasonable to establish minimum inspection and maintenance frequency requirements while also deferring to manufacturer inspection and maintenance schedules when they are stricter than the table.

1702.12.2 Maintenance Log.

This proposed subsection requires property owners or designated appointees to keep on-site records that document the frequency of testing, inspection and maintenance listed in Table

⁴⁵ See overhaul intervals set in [Minnesota Rules, part 4715.2161](#). This rule part is proposed to be repealed in this rulemaking.

1702.12. These records will show whether Table 1702.12 or manufacturer schedules were followed. This requirement ensures proper inspection and maintenance, and ultimately operation, of the rainwater catchment system in a continuous and safe manner.

1702.12.3 Maintenance Responsibility.

This proposed subsection specifies who is ultimately responsible for the proper upkeep of a rainwater catchment system, the property owner. It is reasonable to make the property owner the responsible party because he or she will likely incur the costs of inspection, maintenance, repairs, collateral damage resulting from improperly operating systems and property owners are the responsible party for other mechanical systems. It is further reasonable to assign this responsibility clearly.

Table 1702.12 Minimum Alternate Water Source Testing, Inspection, and Maintenance Frequency.

The table is taken from UPC Chapter 16.⁴⁶ Chapter 16 is not adopted into this code. This table is added to Chapter 17 as it lists the frequency of required testing, inspections and performed maintenance on rainwater catchment systems and is referenced in Chapter 17. The table establishes minimum testing, inspection and maintenance frequencies to follow with the intent of maintaining proper and continuous operation. The information is recorded into the maintenance log required in section 1702.12.2. With a potable water distribution system and an alternate source of nonpotable water such as a rainwater catchment water distribution system located together, a concern for cross-connection always exists. The cross-connection test must be performed by a licensed plumber because they will have the necessary knowledge and experience in water distribution systems and related equipment to perform the tests. The additional requirement of certification to ASSE Standard 5120, Professional Qualifications Standard for Cross-Connection Control Surveyors, verifies the plumber has received specialized training to identify existing and potential cross-connections hazards. ASSE Standard 5120, contained in the ANSI accredited ASSE Series 5000 Standards, is a nationally recognized professional qualification. Minnesota Rule Chapter 4716, currently requires certification to ASSE Standard 5110 and 5130, also part of Series 5000, as proof an individual has received specialized training related to the protection of the potable water system

The requirement that a plumber licensed under Minnesota Statutes, section 326B.46 and certified to ASSE Standard 5120 will conduct the cross-connection tests and intended to conduct the visual inspection is reasonable.

1702.13 Operation and Maintenance Manual.

The proposed amendment adds this section to require the system designer to supply the building owner with a manual that includes, but not limited to, information about: system diagram listing components and location, operating instructions, water quality requirements, deactivation of system and manufacturer contact information. The proposed amendment is needed for the proper operation and maintenance of the rainwater catchment system and a reasonable method to supply this information. Other ways for a building owner to obtain that information would be electronically if supplied in that format by the system designer. It is reasonable to require this

⁴⁶ See UPC Table 1601.5.

information from the system designer because the information contained in the manual would be difficult to come by from another source or would be disproportionately expensive.

1702.14 Separation Requirements.

The proposed amendment adds this section to reference the underground separation requirements relating to the installation of the building sewer, potable water pipes and nonpotable water pipes. This amendment is reasonable because it coincides with other parts of this code, section 609.2, and common industry practice.

1702.15 Abandonment.

The proposed amendment adds this section to address rainwater catchments systems that are no longer in use and not maintained in accordance to this code and labels them abandoned. The UPC does not address abandoned rainwater catchment systems. The most similar UPC section addresses abandonment of sewers and sewage disposal facilities, section 722, but it is proposed to be deleted since these systems are regulated by the Minnesota Pollution Control Agency. However, abandoned rainwater catchment systems can pose serious risk to public health and safety requiring proper abandonment to be addressed. This amendment safeguards against improperly maintained systems and unapproved uses other than the original intent of the rainwater catchment system.

1702.15.1 General.

The proposed amendment adds this subpart to establish the first requirement for abandoned systems: disconnect, drain, plug and cap. Abandoned rainwater catchment systems includes all piping, equipment and storage tanks. Disconnecting abandoned systems from systems that remain in use reasonably eliminates the possibility of contamination of the potable water system still in use. Draining and disconnecting by plugging or capping abandoned systems is a reasonable method to eliminate a potential or actual cross-connection to the potable water system in a controlled manner. It is reasonable to require abandoned rainwater catchment systems be properly disconnected, drained, plugged and capped.

1702.15.2 Underground Tank.

The proposed amendment adds this subsection which requires underground tanks of abandoned systems be drained and filled with an approved material or be removed in an approved manner. It is reasonable to regulate abandoned underground tanks to protect the public from the tank being used for an unapproved or unmonitored purpose and offers two methods of approved abandonment.

Repealer

CONCLUSION

Based on the foregoing, the proposed rules are both needed and reasonable.

[Date]

John Parizek, Chair
Minnesota Plumbing Board

This SONAR is made available for public review, per OAH Rules, part 1400.2070, subpart 1, item E., as of ____.



emanuelson-podas
consulting engineers

PETITION FOR VARIANCE

September 9, 2014

Plumbing Board
c/o Department of Labor and Industry
443 Lafayette Road North
St Paul MN 55155-4344

RE: **Petition for a Variance**
Manitou Ridge Golf Course – White Bear Lake, MN
DOLI Plan No. PLB1306-00125

We are submitting this petition for a variance per the standards and procedures set forth in MN 14.055, 14.056 on behalf of:

Ramsey County Parks & Recreation
2015 Van Dyke St N
Maplewood, MN 55109

Background

With an eye toward environmental stewardship, Ramsey County Parks & Recreation installed their first Water Maze water treatment system at Keller Golf Course in Maplewood in 2003. For over a decade, the Water Maze system has effectively treated drainage from the golf cart wash pad. The waste stream from the wash pad contains an inordinate amount of grass and other organics plus total petroleum hydrocarbons from pesticides, herbicides and insecticides. The Water Maze system filters out the organics and then utilizes a blend of microbes and aeration to break down the hydrocarbons to harmless CO₂ and H₂O prior to discharging to sanitary sewer.

Ramsey County Parks & Recreation would like to apply this same technology at Manitou Ridge Golf Course in one of the following two ways:

- 1) **Treat** waste stream from golf cart wash pad and **discharge** into sanitary sewer.
- 2) **Treat** waste stream from golf cart wash pad and **recycle** water to be re-used for golf cart washing.

Petition for Variance

The petition for variance is related to the following Minnesota rule:

"4715.1200

All plumbing fixtures and drains used to receive or discharge liquid wastes or sewage shall be connected to the drainage system of the building in accordance with the requirements of the code."

The petition for variance is two-part as follows:

- (1) In lieu of a direct connection from the trench drain to the building drainage system, install a water treatment system to treat the waste water prior to discharge into the drainage system.
- (2) In lieu of a direct connection from the trench drain to the building drainage system, install a water treatment system to treat the waste water and then recycle the water for re-use in cart washing.

Description of the proposed system:

1. The project includes a covered golf cart wash pad on the exterior of the new golf maintenance building.
2. The wash pad and trench drain is designed such that no rainwater will get into the system with the following provisions:
 - a. wash pad is covered with a canopy
 - b. all grade slopes away from pad
 - c. there is curbing around the trench drain
3. The trench drain is connected to a sump basin.
4. A sump pump would pump the waste water from the sump to a receiver mounted on the exterior wall of the building. The receiver has a strainer to filter out grass clippings and the like.
5. The waste water then flows into the Water Maze treatment system.
6. See the enclosed memo from Allen Hurtado, application and process engineer from Water Maze, for a complete description of the Water Maze system.
7. The Water Maze can be set up for one of two functions:
 - a. Treat and discharge:
 - i. Water Maze treats waste water as described above.
 - ii. Then discharges treated water into sanitary sewer system through floor sinks located below the water maze system.
 - b. Recycling System:
 - i. An extra unit is added to the water maze to further treat the water and this water is pumped through a hose connection available to recycle.
 - ii. A building water connection is also made to the Water Maze to allow for water use when recycled water is not available. An RPZ provides cross connection control.
8. An additional overflow drain line that pipes directly from the sump basin (@ same elevation as inlet to basin) to the sanitary sewer could be added to the configuration. In case of a failure of the sump pump in the basin, the water would rise up and eventually drain directly into the sewer line upstream of a flammable waste trap.

Reasons for a Variance

The Water Maze water treatment system as applied to golf course cart washing is a fully engineered system that has been successfully used on thousands of installations across the country.

The system is a sustainable solution, providing water treatment and recycling, thereby reducing water usage.

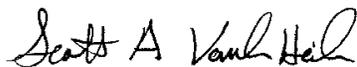
The system poses very little, if any, health risk. For more than 10 years, the county has successfully maintained the same system at Keller Golf Course.

It seems that the main reason that this system was rejected in plumbing plan review is simply that the MN Plumbing Code does not address gray water recycling systems. In effect, the reviewers have their hands tied due to the fact that the plumbing code has not been updated in this area (UPC and IPC both address said systems).

We are asking that the Minnesota Plumbing Board grant a variance to allow the use of the Water Maze system as a recycling system, thereby taking full advantage of the system capabilities.

Please contact me with any further information that you may need to make a decision.

Cordially,



Scott Vander Heiden, PE MN#40918

Enclosures

- Letter from Paul Diegau, Golf Course Superintendent – Keller Golf Course
- Letter from Ryan Ries – Ramsey County Parks & Recreation
- Memo from Allen Hurtado, Application and Process Engineer – Water Maze
- Maintenance procedures – Treat and Discharge System
- Maintenance procedures – Recycle System
- List of Project References



makes a difference



FROM THE DESK OF: **Allen Hurtado, Application and Process Engineer**

Date: September 2, 2014

Project Identification: Ramsey Co. Minnesota, Manitou Golf Course

Water Maze Dealer: American Pressure

Attention: Scott Vander Heiden, P.E., Emanuelson Podas Inc., Shaun McMillen, Fluid Solutions Inc., Authorized Water Maze Dealer

Reviewed by: Allen Hurtado

Supporting Data: Water Maze O&M manual, Partial List of Water Maze Installations

The purpose of this memo is to answer some specific questions regarding the proposed installation and operation of a Water Maze CLB biological water treatment system and ancillary equipment. In addition to past information that has conveyed, the following is a question and answer format to recent questions pertinent to application for a waiver from recent denial of approval by the local regulatory authority.

Worth noting in the discussion is that the proposed treatment approach is in widespread use, not only throughout North America, but in Minnesota as well. The primary treatment process is simply an accelerated version of natural biological processes that convert organic wastes into harmless byproducts.

The following questions (Q.) have been posed by Scott and answered (A.) by Allen Hurtado:

Q. Describe how the system works to treat the water

A: Summary of the treatment process:

1. Water from the equipment and vehicle washing process is collected on a wash pad designed with strategically sloped floor and trenches. The pad and trenches should be designed to capture easily-settleable solids that are denser than water.
 - a. - The solids are removed by manual maintenance.
 - b. - Water flows through the trench to a collection sump.
 - c. - NOTE: this step is commonly referred to as part of pre-treatment ahead of primary treatment.
2. Pump in the collection sump transfers water through a HydroScreen device to separate larger neutral and light-density solids (mainly vegetable matter) from the wastewater stream and collect them in a screened dumpster for transportation and disposal to a composting area.
 - a. - NOTE: this step is commonly referred to as part of pre-treatment, ahead of primary treatment.
3. HydroScreened wastewater is transferred to an aerobic digester vessel with a working volume of approximately 550-gallons.

- a. - After heavy and light density solids are separated by gravity and screening pre-treatment the waste water contains primarily soluble detergent/cleaning products, golf-cart food and beverage residuals, dirt/grime, vegetation juices, small amounts of lawn and turf care chemistry, small amounts of oil/grease from equipment.
- b. - Depending on the waste water processing volume, contaminant load and final disposition of the treated water for a given system, a secondary digester and/or treated water storage tank may be installed in series. If so configured, the water from the final tank is recirculated back to the primary digester for reprocessing.
4. Aeration, recirculation, and dosing of pH adjustment (if necessary), beneficial aerobic microbes and microbial nutrient are introduced and maintained in the digester on a programmed basis.
5. The beneficial aerobic microbes consume the organic content of the raw water over a period of several hours, converting the simple and complex organic compounds to primarily carbon dioxide and water byproducts.
 - a. - A small amount of settleable solids are captured in a separate sludge management container.
 - b. - An automatic electrical control system with Operator Interface controls the various functions of pumps, valves and solution dosing systems.
 - c. - Tank configuration therefor will be one of the following:
 - i. - Primary digester -> Treated water storage -> Recycle with fraction to discharge
 - ii. - Primary digester -> Secondary digester -> Treated water storage -> Recycle large fraction. Small fraction to discharge
 - iii. - Primary digester -> Secondary digester -> Discharge
6. Optional – In some applications where water is to be recycled to the wash process, a measure of disinfection may be desirable. A polishing particulate filter and high-intensity ultraviolet sterilizer may be added to inactivate both pathogenic and non-pathogenic microbes that may be present in the finished water. The ultraviolet disinfection device should be located as close as possible to the dispensing point of the recycled water.

Q. What is the condition of the treated water?

A. Customary golf/turf BOD counts of 500-1,500 are typically reduced by 85-95%. Visible color and measurable color units are reduced 60-90%. Dissolved solids are unaffected. Metals are unaffected.

Q. What maintenance is required?

A. Regular maintenance of the system is minimal

- a. Scoop out and dispose of heavy settleable solids (dirt, sand) from the bottom of the trench drains. Typically 1-3-times per week depending on wash pad design and golf course terrain.
- b. Dispose of vegetation material collected in the collection dumpster. Typically 1-3-times per week depending on golf course turf, vegetation and cut styles
- c. Replenish beneficial microbe and nutrient solutions as needed. Check weekly.
- d. Inspect bio-digester vessel internally. Monthly. Typically no action required.
- e. Inspect and/or clean fixed-film bio-media. Yearly.
- f. Overall inspection of pumps, aeration system and valve operation. Yearly.



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g. Please see O&M manuals submitted by Fluid Solutions for further details.

Q. What happens if maintenance is not done - what is the worst that can happen?

A. Assuming that mechanical operations (aeration, pumps, valves) continue to function, but that operator attention to replenishment does not take place, the population of beneficial aerobic microbes will fluctuate. When the microbe population fluctuates low, it may not fully handle high influent BOD loads that occur normally on a daily or weekly basis - depending on golf course activity. The system will exhibit normal to diminished levels of organic digestion that exhibit as higher BOD count and visible color. An excess of beneficial microbes poses no problem as the population is self-regulating when influent BOD loads diminish. The dosed nutrient maintains sufficient microbial population during low influent BOD loading periods.

Q. How has the system been used in other states.

A. (answered by Bernie Larson, Water Maze National Sales Manager):

Water Maze, which originated in 1987 as "Landa Water Cleaning Systems", has sold over 15,000 wash water treatment systems into the global markets. Our first bioremediation system (a.k.a. Water Stax, or BioSystem) was produced between 1995 and 1996.

Although we have applied our bioremediation technology to other applications, our BioSystem is designed specifically for treating water generated from washing golf course maintenance equipment. Over the past many years, our BioSystems have been installed in almost every state in the USA, Australia, Korea, Singapore, and U.A.E.

When a U.S.A. National Cemetery is upgrading or building a new wash rack facility, our BioSystem is specified by the US Government. Although I do not have an exact number, based on my 20 years work history with Water Maze, I estimate that we have sold more than 600 BioSystems.

Thank you for the opportunity to provide this additional information in support of your project.

Sincerely,

Allen Hurtado

Allen Hurtado

Modular BioSystems for Total Flexibility

All-Natural Recycle or Discharge Systems

Works for Golf-Turf and Industrial Applications

Easy to Maintain with Automatic Purge Feature

■ Patented **Air Stick** injects into the waste stream higher levels of dissolved oxygen than air blowers or compressed air to maximize aerobic digestion rates and overcome high BOD levels.

■ Wastewater initially passes through an optional stainless steel **HydroScreen** that separates grass clippings and deposits them in a grass cart for easy **Disposal**.

■ Optional stainless steel mesh lined **Grass Cart** for easy dewatering and handling of grass clippings.



Certified to UL-1081 Safety Standards

With a NEW **WaterStax Golf Course Package**



The CLB BioSystem is available with a **WaterStax Golf Course** package for treating wash-water with a high content of grass clippings and other greenery.



Optional cart for easy disposal of grass clippings

CLT-300 pre-treatment tank with optional HydroScreen

Optional recycled water holding tank

CLB-603A/B main bio-digestion unit with automated controls

CLT-600 for enhanced bio-digestion (add more CLT units as needed)

■ More than 2,000 cubic feet of **Bio-Media** create an ideal breeding ground for aerobic bacteria to quickly multiply and consume hydrocarbon-based contaminants, converting them to harmless H₂O and CO₂. The media is kept in bags that are easy to remove and service.

■ **Timer-controlled Purge System** automatically removes sludge and also flushes the system with treated water for ease of maintenance.

■ Optional submersible, cast iron **Sump Pump** is designed to lift heavy solids typically found in industrial applications.

■ **Water-resistant, metal cabinet** is protected by a powder-coat epoxy finish and houses the **Control Center**, including timers and dispensing pumps. A water-resistant Nema 4 fiberglass control box protects electrical componentry.

■ **3/4 HP Circulation Pump** increases microbial digestion by creating optimum exposure of the wastewater to the bags of bio-media.

■ Conveniently located **Hose Connections** are clearly labeled for water inlet, fresh-water make-up, rainwater overflow and recycling (CLB-603 only).

■ **Durable, high-density, crosslinked polyethylene BioSystem Tanks** are extra-resistant to chemical fatigue and ultraviolet exposure. The polyethylene also attracts oils and organics providing additional surface area for biological growth.

■ **Cone-bottom CLT Tanks** have a 60° slope to enhance the settling and removal of suspended solids in the wastestream.

■ **High-output UV Ozone Generator** for additional polishing of the water (CLB-603 only).

CLB

Advanced Biological Treatment Systems for Golf Course Wash Facilities and Turf Applications

Modular BioSystems for Total Flexibility | Recycle or Discharge Units | For Golf-Turf, Commercial & Industrial Applications

The Water Maze BioSystem or CLB series employs the latest bio-technology for treating and recycling commercial and industrial wastewater, including golf and turf applications



Liquid concentrate of the BioStax 900 microbe solution comes in a variety of sizes along with our BioNutrient enhancer.

where there's a high organic content in the wash water.

The CLB's unique design features modular

components so the system is customized to match each customer's application requirements as well as to keep the equipment cost and performance to only what is truly needed. Moreover, the systems are automated for ease of maintenance.

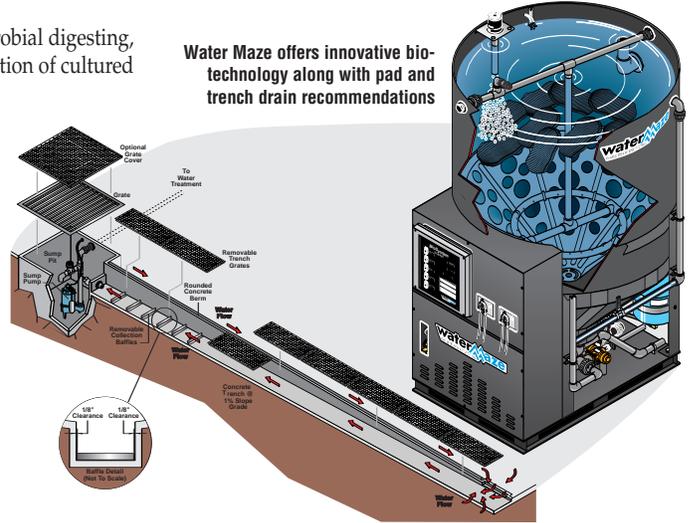
Water Maze's advanced bio-technology fea-

tures super-efficient aerobic microbial digesting, enhanced water circulation, injection of cultured microbes at concentrated levels and the introduction of a special microbial nutrients blend.

Unlike filtration systems, which create a sometimes hazardous sludge, the BioSystem naturally converts organic contaminants, such as oil, grease, etc., in a waste stream into harmless water and carbon dioxide.

Other features include: high-density, crosslinked, polyethylene tanks; water-resistant electronics control panel; and 2,087 sq. ft. of bio-media.

Water Maze offers innovative bio-technology along with pad and trench drain recommendations



CLB Specifications	RECYCLE SYSTEM	DISCHARGE SYSTEM	AUXILIARY UNIT	
MODEL	CLB-603A, B	CLB-600D	CLB-30D	<p>* THE PROCESSING RATE varies for each site. Factors that must be considered are:</p> <ul style="list-style-type: none"> • Average daily flow (gallons per day) • BOD levels (ppm); • Oxygen input (dissolved oxygen); • Hydraulic retention time (HRT); • Total petroleum hydrocarbons (TPH); • water temperature and pH. <p>Based on these factors a qualified Water Maze sales engineer will calculate the estimated processing rate and make a recommendation as to the size of system needed.</p>
Designed For	Recycle	Discharge	Auxiliary	
Tank Capacity	600 gal.	600 gal.	600 gal.	
Tank Material	Polyethylene	Polyethylene	Polyethylene	
Processing Rate	See explanation at right	See explanation at right	See explanation at right	
Bio-Media	2087 sq.ft.	2087 sq.ft.	2087 sq.ft.	
Sump Pump	Optional	Optional	Optional	
In-Feed / Circulation Pump	3/4 HP	3/4 HP	N / A	
Transfer Pump	3/4 HP (2 HP optional)	N / A	N / A	
Ozone Pump	3/4 HP	N / A	N / A	
Ozone Generator	4-Tube Ultraviolet	N / A	N/A	
Electrical	A: 230V 1ph 20 amps B: 230V 3ph 20 amps	120V 1ph 9 amps	120V 1ph 1 amp	
Aeration	VBT-100 "Airstick"	VBT-100 "Airstick"	VBT-100 "Airstick"	
Dimensions	65" L x 54" W x 105" H	65" L x 54" W x 105" H	65" L x 54" W x 101" H	
Ship Weight	1,050 lbs	TBD	TBD	

Distributed by:

OPTIONS INCLUDE: BioStax 900, 1800 or 100 Hawaiian Blend, microbe concentrate; BioNutrient microbe nutrient source; 300- and 600-gallon tanks for added processing; pH controller; sump pump; oil skimmer with collection tank; sludge tub with lid; sump pump; grass cart, dumpster and HydroScreen for filtering grass clippings.

See your Water Maze Dealer for part numbers and pricing.



PN #97-0094GC Effective 9/05 800-535-0941 Fax: 800-535-9164 info@wmaze.com
Specifications and product descriptions subject to change without notice. © 2005

CLB MAINTENANCE

DAILY MAINTENANCE

To keep your Bio-System in peak performance you need to perform minimal daily maintenance. This service is best performed each morning before using the wash area..

- Check and clean catch basin and trench.
- Empty the debris dumpster.
- Wash down front and back of hydro-screen, preferably with a pressure washer.

WEEKLY MAINTENANCE

- Check that purge drain valves work properly.
- Check that timers are set properly.

MONTHLY MAINTENANCE

Monthly maintenance for the Bio-System and replenishment of BioStax 900 is required. Schedule a regular day and time each month to perform the maintenance. Record your maintenance in the monthly log to provide a record in the event of an inspection.

- Replenish BioStax 900.
- Replenish BioNutrient.
- Check the automatic microbe dispenser pump and make sure the tubing is not cracked or worn. Replace tubing if required (every 6-12 months). Clean screen in tubing going in microbe bucket.
- Visually inspect external hoses and fittings.
- Confirm pressure switch setting on transfer pump.

CLB MAINTENANCE

	DAILY	WEEKLY	MONTHLY	BI-YEARLY
Check pits for water level (Overflow/dry).	X			
Check for voltage to machine and that control panel switches are on.	X			
Check all plumbing for leaks.	X			
Check inlet flow meter for proper flow. Clean meter if needed.	X			
Check that inlet and discharge manifold hoses and valves are in proper position.	X			
Clean and test pH probe if applicable*.		X		
Suction pits of sludge and debris.*			X	
Check and clean sump pump of dirt and debris.*			X	
Clean floats in sump if accumulating dirt or grease. *			X	
Check float wires for cuts or frays.			X	
Check and clean chemical injectors.			X	
Check tubing on pH controller for splits or cracking.			X	
Check standard cubic feet per hour (SCFM) on ozone generator.			X	
Open drain valve to purge solids.	X			
Empty debris dumpster	X			
Pressure wash front and back of debris dumpster.	X			
Clean trench	X			
Check timers for proper settings		X		
Replenish BioStax 900 and BioNutrient if applicable*			X	
* Note: this is a guide. Depending on your wash load these items may have to be done more or less often				

CLB MAINTENANCE

DAILY MAINTENANCE

To keep your Bio-System in peak performance you need to perform minimal daily maintenance. This service is best performed each morning before using the wash area..

- Check and clean catch basin and trench.
- Empty the debris dumpster.
- Wash down front and back of hydro-screen, preferably with a pressure washer.

WEEKLY MAINTENANCE

- Check that purge drain valves work properly.
- Check that timers are set properly.

MONTHLY MAINTENANCE

Monthly maintenance for the Bio-System and replenishment of BioStax 1800 is required. Schedule a regular day and time each month to perform the maintenance. Record your maintenance in the monthly log to provide a record in the event of an inspection.

- Replenish BioStax 1800.
- Replenish BioNutrient.
- Check the automatic microbe dispenser pump and make sure the tubing is not cracked or worn. Replace tubing if required (every 6-12 months). Clean screen in tubing going in microbe bucket.
- Visually inspect external hoses and fittings.
- Confirm pressure switch setting on transfer pump.

CLB MAINTENANCE

	DAILY	WEEKLY		BI-YEARLY
Check pits for water level (Overflow/dry).	X			
Check for voltage to machine and that control panel switches are on.	X			
Check all plumbing for leaks.	X			
Check inlet flow meter for proper flow. Clean meter if needed.	X			
Check that inlet and discharge manifold hoses and valves are in proper position.	X			
Check ozone generator bulb. Bright light-replace. Dim light good.	X			
Clean and test pH probe if applicable*.		X		
Suction pits of sludge and debris.*			X	
Check and clean sump pump of dirt and debris.*			X	
Clean floats in sump if accumulating dirt or grease. *			X	
Check float wires for cuts or frays.			X	
Check and clean chemical injectors.			X	
Check tubing on pH controller for splits or cracking.			X	
Check standard cubic feet per hour (SCFM) on ozone generator.			X	
Check surge tank pressure.				X
Check transfer pump switch settings.			X	
Open drain valve to purge solids.	X			
Empty debris dumpster	X			
Pressure wash front and back of debris dumpster.	X			
Clean trench	X			
Check timers for proper settings		X		
Replenish BioStax 1800 and BioNutrient if applicable*			X	

* Note: this is a guide. Depending on your wash load these items may have to be done more or less often.

WATERSTAX INSTALLATIONS

Alaska Ft. Wainwright Golf Maint. Facility Fairbanks.	Maryvale Golf Course Phoenix	Williams AFB Ph
Arkansas Pleasant Valley Golf Club Little Rock	ArroyoDunes Golf Course Yuma	Hassayampa Golf Course
Sedona Golf & Tennis Sedona	The Raven at South Mountain Phoenix	California The Victoria Club Riverside
Torreon Maintenance Facility Show Low	Apache, Desert Mountain Scottsdale	Simi Hills Golf Course Simi Hills
Imperial Nat. Wildlife Refuge Yuma	Paradise Valley Country Club Country Club	Redhawk Golf Course Temecula
Stonecreek Golf Club Paradise Valley	Vulcan Sun City Phoenix	The Plantation La Quinta
Sanctuary Golf Club Scottsdale	Sheraton El Con Quistador Tucson	Vineyard at Escondido Escondido
Valley Truck & Trailer Service Glendale	Estrella Mt Ranch Golf Goodyear	The Bridges at Gale Ranch San Ramon
Cabreza Prieta Refuge Ajo	Whirlwind Golf Club Chandler	San Diego Country Club Chula Vista
Army Corp of Engineers	Mountain Brook Village Apache Junction	The Auld Course Chula Vista
Eagle's Landing Country Club Phoenix	Raven Golf Club, Sebino Springs Tucson	The Crosby National Golf Club Rancho Santa Fe
Rancho Manana Golf Club Phoenix	Renegade, Desert Mountain Scottsdale	Ranch Vista Golf Club Palmdale
Tucson Country Club Tucson	Heritage Highlands Tucson	Lake Tahoe Golf Course S. Lake Tahoe
Talking Stick Scottsdale	Eagle Mountain Fountain Hill	Valley Club of Montecito Santa Barbara
Estrella Mountain Ranch Phoenix	Tatum Ranch Golf Club Cave Creek	Cypress Ridge Golf Course Arroyo Grande
Prestwick Development Phoenix	Quail Run Maintenance Sun City	Morgan Run Resort & Club Rancho Sante Fe
Troon North Golf Club Scottsdale	DC Ranch Scottsdale	Moreno Valley Ranch Golf Club Moreno Valley
The Ridge at Castle Pines Colorado	Stonecreek Phoenix	Landmark Golf Club Indio
	Desert Forest Golf Course Carefree	Ocean Traila Golf Club Rancho Palos Verdes

WATERSTAX INSTALLATIONS

Yucaipa Valley Golf Course Yucaipa Valley	Watertown Golf Club Watertown	Idaho Valley Golf Club Hailey
Annandale Country Club Pasadena	Country Club of Waterbury Waterbury	Kansas Colbert Hills Country Club Manhattan
Rolling Hills Country Club Rolling Hills Estates	Foxx Hopyard Golf Club East Haddam	Nicklaus Golf Club at Lions Gate Oakland Park
Rancho San Marcos Santa Barbara	Florida Lost Key Plantation Perdido Key	Massachusetts MA Veterans Memorial Cemetery Agawam
Virginia Country Club Long Beach	Inverrary Country Club Lauderhill	Pine Hill Golf Course Plymouth
Sun City Palm Desert Palm Desert	Golden Bear Golf Club Hammock Creek	Maryland Cattail Creek Country Club Glenwood
City of Santa Barbara Santa Barbara	Fiddler's Creek Naples	Minnesota Minikahda Club Minneapolis
City of Ventura Ventura	Sail Fish Pointe Stewart	Nevada Seven Hills Henderson
Hanson Dam City of LA Los Angeles	Orange County National Orlando	MGM Golf Course Boulder City
Crystal Springs City of LA Los Angeles	Georgia Champions Club of Gwinette Snellville Cherokee Run GC Conyers	Reflection Bay Golf Maintenance Henderson
South Bay Wilmington City of LA Los Angeles	Trophy Club of Atlantic Alpharetta	Spanish Trail Golf Course Las Vegas
Balboa City of LA Los Angeles	White Columns Golf Club Alpharetta	Gragon Ridge Golf Course Las Vegas
Indian Ridge Country Club Palm Desert	Stone Mountain Golf Club Stone Mountain	The Casablanca Hotel/Casino Mesquite
Wente Golf Livermore	Polo Golf Club Cumming	Bear's Best Las Vegas Las Vegas
Round Hill Walnut Creek	Bears Best Atlanta Sugar Hill	New Mexico Tueras Arroyo Golf Course Kirkland AFB
Colorado Broadmore Golf Club Colorado Springs	The Club at Savannah Harbor Savannah	New York Foxfire Golf Course Baldwinsville
The Ridge at Castle Pines Castle Rock	Nicklaus Golf Club Birch River Dahlonega	
Connecticut Clinton Country Club Clinton Country Club		

WATERSTAX INSTALLATIONS

Greystone Golf Course
Walworth

North Carolina

Governors Club
Chapel Hill

Oregon

Langdon Farms Golf Course
Aurora

South Carolina

Moss Creek Country Club
Hilton Head

Rivertowne Country Club
Mt Pleasant

Texas

Prescott

Grand Prairie Country Club
Grand Prairie

The Regals Three Systems
Fort Worth

Commanche Trace Ranch GC
Kerrville

The Creeks at Beechwood
Fort Worth

Yaupon Golf Course
Austin

The Hills at Lakeway
Austin

Prof. Turf Products of Texas
Houston, Dallas, San Antonio

Sweetwater Country Club
Houston

Utah

New Star General Contractors
Park City

Vermont

Vermont National Country Club
South Burlington

Brandermill Country Club
Richmond

Baymark Construction Corp
Cape Charles

Washington

Port Ludlow Golf
Golf

Indian Summer
Olympia

Canterwood Golf & Country Club
Gig Harbour

Sudden Valley Golf Course
Bellingham

Trophy Lake Golf & Casting
Port Orchard

Washington National Golf Course
Auburn

International

Country Club Philippines
Manila

Punta Mita Golf Course
Puerta Vallarta, MX



September 3, 2014 -

Plumbing Board
c/o Department of Labor and Industry
443 Lafayette Road North
St. Paul, MN 55155-4344

To Whom It May Concern:

Please find attached a variance application to permit the use of a wash-water treatment and recycling system at a project currently under construction at Manitou Ridge Golf Course in White Bear Lake and a 2015 project at Goodrich Golf Course, both owned by Ramsey County. The County would like to install a system for treating and recycling water used to wash golf carts and mowing equipment at each location. The Department of Labor and Industry has previously rejected this system in their plumbing plan review of the Manitou Ridge Project.

Ramsey County, and in particular the Parks & Recreation department, takes its role as a steward of the environment seriously. The proposed wash-water system is an example of this commitment. The system was funded by a Leadership in Environmental Stewardship grant from Ramsey County Public Health and the City of St. Paul. As a government agency, the County owes its constituents to provide safe, environmentally-friendly facilities.

Furthermore, the County is committed to doing its part to alleviate the water usage concerns surrounding White Bear Lake, which is near Manitou Ridge. In recent years, the County has been forced to close its beach on White Bear Lake as a result of decreasing water levels. Since golf courses use a significant amount of water, it is in the best interest of those who live near or depend on White Bear Lake to develop innovative ways to limit water demand on the aquifer. The proposed system does just that.

The County has a similar treatment system installed at Keller Golf Course. Enclosed you will find a letter from the course superintendent detailing the maintenance requirements the County has followed for more than 10 years. The County is committed to, and has demonstrated, periodic and seasonal maintenance of the proposed system per the manufacturer's requirements. Similar systems are installed in various courses across the state (and nation); to our knowledge, no safety concerns have ever been reported regarding these systems.

The DOLI Plan Review has indicated this system is not "required" since downstream wastewater treatment can currently treat contaminated water from the course. This is myopic to say the least. Again, the County strongly believes in being a steward of the communities it serves, and attempts to proactively reduce the impact of its facilities on the environment. By "doing the right thing", the County hopes to serve as an example to residents and other stakeholders and to ensure the services and facilities it provides will serve future generations as well as current ones. These values mirror those of such State agencies as the Minnesota Pollution Control Agency (whose mission is: "Working to protect and improve our environment and enhance human health"). While the County understands DOLI's responsibility to ensure compliance with current plumbing codes, it is also reasonable to expect

flexibility in instances where said compliance comes at the expense of the environment and in direct opposition to the State's various environmental policies.

The proposed wash-water treatment and recycling system at Manitou Ridge Golf Course and Goodrich Golf Course is safe, easy to maintain, and environmentally-friendly. It is the County's sincere hope that the State approves this variance in the best interests of our shared constituents and natural resources.

Should you have any questions regarding this application, please do not hesitate to contact me.

Thank you.

Sincerely,

A handwritten signature in blue ink that reads "Ryan Ries". The signature is written in a cursive style with a blue color.

Ryan Ries
Project Manager
Ramsey County Parks & Recreation
2015 N. Van Dyke St.
Maplewood, MN 55109
651-748-2500
ryan.ries@co.ramsey.mn.us



August 28, 2014

To Whom It May Concern:

As the superintendent at Keller Golf Course in Maplewood, I have significant experience with the Watermaze treat-and-discharge wash water system proposed at the Manitou Ridge Maintenance Facility project in White Bear Lake. It has been a wonderful system for our course, and I would encourage the State to approve a variance to allow this system to be installed at Manitou Ridge and other locations.

The Watermaze system at Keller has been operational since 2003. In the 11 years it has been in service it has never "failed". The microbes used by the system are totally safe. This product is a two-part liquid blend of a non-toxic, non-pathogenic microbial concentrate. There are no hazardous by-products as the bacteria converts hydrocarbons into carbon dioxide and water. Additionally, the wash pad is covered and surface grades surrounding the pad do not allow rainwater to flow onto the pad. Simply put, the system is completely safe.

Additionally, the maintenance is minimal. Product is added to the system once a month, and the system is winterized at the end of the year. The cost of the product is approximately \$112/month. This is funded out of our operating budget, just like fertilizer, golf course chemicals, etc. Periodic maintenance is the core of what golf course maintenance is about – when to mow, when to fertilize, and so forth. The Watermaze system maintenance requirements are minimal compared to the rigorous daily maintenance required out on the course itself.

I understand the system proposed at Manitou Ridge has a recycling component to allow re-use of wash water. We would love to have a recycling system here. Golf courses in the Southwestern part of the country are required to recycle wash water due to water shortage concerns. Given recent issues with decreasing water levels at White Bear Lake, it seems imperative that facilities utilize all water conservation methods available. The future of the golf course industry suggests that the recycling requirement will spread to the rest of the country in the next 5 to 10 years.

I highly recommend the Watermaze system as a best practice, environmentally friendly, easy-maintenance solution for golf course equipment washing.

Sincerely

Paul Diegnau, CGCS
Golf Course Superintendent
Keller Golf Course
2166 Maplewood Drive
Maplewood, MN 55109