Plumbing Board c/o Department of Labor and Industry 443 Lafayette Road North St. Paul, MN 55155-4344 www.dli.mn.gov Email: <u>DLI.ccldboards@state.mn.us</u>

Plumbing Board Request for Action

PRINT IN INK or TYPE

NAME OF SUBMITTER		PURPOSE OF REQUEST (chec	ck all that apply): 🛛 New Code		
Anita Anderson		✓ Code Amendment □ R	epeal of an existing Rule		
The Minnesota Plumbing Code (MN Rules, Chapter 4714) is available at https://epubs.iapmo.org/2020/MPC/					
Specify the purpose of the proposal: If recommendation for code change for appurtenance or method (check all that apply)					
Appurtenance (e.g., water conditioning equip	Appurtenance (e.g., water conditioning equipment)				
✓ Other (describe) The purpose of the proposal is to amend the Minnesota Plumbing Code to allow PVC for cold water piping in treatment systems.					
Does your submission contain a Trade Secret	? 🗌 Ye	es √ No			
If Yes, mark "TRADE SECRET " prominently on e information. Minnesota Statutes, section 13.37, su	If Yes, mark " TRADE SECRET " prominently on each page of your submission that you believe contains trade secret information. Minnesota Statutes, section 13.37, subdivision 1(b), defines "trade secret" as follows:				
"Trade secret information" means government data, including a formula, pattern, compilation, program, device, method, technique or process (1) that was supplied by the affected individual or organization, (2) that is the subject of efforts by the individual or organization that are reasonable under the circumstances to maintain its secrecy, and (3) that derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use.					
Note that, although "trade secret" information is ge secret" information at a public meeting of the Boar conduct the business or agenda item before it (su	enerally not rd or commi ch as your i	public, the Board and its comi ittee if reasonably necessary for request.) The record of the me	mittees may disclose "trade or the Board or committee to eeting will be public.		
Describe the proposed change. The Minnesota <u>https://epubs.iapmo.org/2020/MPC/</u>	I Plumbing (Code (Minnesota Rules Chapt	er 4714) is available here:		
 NOTE: Please review the Minnesota Plumbing Code and include all parts of the Code that require revision to accomplish your purpose. The proposed change, including suggested rule language, should be <i>specific</i>. If modifying existing rule language, underline new words and strike through deleted words. 					
Please list all areas of the Minnesota Plumbing Co	ode that wo	uld be affected.			
Please see attached.					
For Office/Committee Use Only Proposal	received corr	nplete? 🗌 Yes 🗌 No			
Date Proposer notified of gaps: Mode of notification (e.g., e-mail)	Date returned to Proposer:	Date materials re-received:		
Office Use Only					
RFA File No.Date Received by DLPB02056/2/2025	.1	Dated Received by Committee 6/3/2025	Date of Forwarded to Board TBD		
Title of RFA					
Title of RFA PB0205.RFA.Anita Anderson.MDH.Chapter 6 PVC.Rec'd 6.2.2025					
Committee Recommendation to the Board: Accept Reject Abstain					
Board approved as submitted: Yes No	C	Board approved as modified:	□ Yes □ No		

Need and Reasons For the Change. Thoroughly explain the need and why you believe it is reasonable to make this change. During a rulemaking process, the need and reasonableness of all proposed rule changes must be justified; therefore, a detailed explanation is necessary to ensure the Board thoroughly considers all aspects of the proposal.

Please see attached.

If your product/method standard(s) is not currently listed in a national code, your Request For Action will not be considered by the Board or its committees, however, you are welcome to present at any Board meeting during the Open Forum section of the Agenda.

The proposal must be accompanied by copies of any published standards, the results of testing, and copies of any product listings, as documentation of the health, sanitation and safety performance of any materials, methods, fixtures, and/or appurtenances. If none are available, please explain:

All supporting standards are already listed in the 2020 Minnesota Plumbing Code.

Please attach electronic scanned copies of any literature, standards and product approvals or listings. Printed or copyrighted materials, *along with written permission from the publisher to distribute the materials at meetings*, and email to <u>DLI.ccldboards@state.mn.us</u>

Primary reason for change: (check only one)	
□ Protect public, health, safety, welfare, or security	Mandated by legislature
Lower construction costs	\checkmark Provide uniform application
Encourage new methods and materials	□ Clarify provisions
Change made at national level	☐ Situation unique to Minnesota
□ Other (describe)	
Anticipated benefits: (check all that apply)	
□ Save lives/reduce injuries	✓ Provide more affordable construction
✓ Improve uniform application	Provide building property
□ Improve health of indoor environment	\checkmark Drinking water quality protection
✓ Provide more construction alternatives	Decrease cost of enforcement
□ Reduce regulation □ Other (describe)	

The Following Information is Optional. This Information can Assist in Evaluating a Request for Action and in Rulemaking and Should be Provided if Known.					
Economic impact: (explain all answers marked "yes")					
1. Does the proposed change increase or decrease the cost of enforcement? \Box Yes \checkmark No If yes, explain					
2. Does the proposed change increase or decrease the cost of compliance? \checkmark Yes \Box No If yes, explain					
Include the estimated cost increase or decrease, and who will bear the cost increase or experience the cost decrease:					
Using PVC instead of CVPC for cold water indoor treatment applications will reduce the cost of compliance for public water systems because it is a less expensive material that still meets the necessary standards for the application.					
3. Are there less costly or intrusive methods to achieve the proposed change? \Box Yes \checkmark No If yes, explain					
4. Ware alternative methods considered?					
methods were considered and why they were rejected.					
Leaving the code as is causes increased cost and confusion for public water systems seeking compliance with the Safe Drinking Water Act because they don't know what materials will be accepted for construction of treatment systems.					
 If there is a fiscal impact, try to explain any benefit that will offset the cost of the change. If there is no impact, mark "N/A." 					
Costs to public water supplies will either decrease or remain the same under the proposal.					
Provide a description of the classes of persons affected by a proposed change, who will bear the cost, and who will benefit.					
Public water systems that are required to provide treatment to meet Safe Drinking Water Act (SDWA) requirements will benefit from this change by having robust and operable treatment systems at reduced cost. Consumers will benefit from drinking water that is in compliance with the SDWA.					
7. Does the proposed rule affect farming operations? (Agricultural buildings are exempt from the Minnesota Building Code					
under Minnesota Statutes, Section 326B.121.) 🗌 Yes 🗸 No If yes, explain					
Are there any existing Federal Standards? \Box Yes \checkmark No If yes, list:					
40 CFR 141.2 defines Finished water: "Finished water is water that is introduced into the distribution system of a public water system and is intended for distribution and consumption without further treatment, except as treatment necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals)." Ou proposed change provides more consistency with this federal definition					
Are there any differences between the proposed change and existing federal regulations? \Box Yes $\sqrt{N_0}$					
Not applicable Unknown If yes, describe each difference & explain why each difference is needed & reasonable.					
Minnesota Statutes, section 14.127, requires the Board to determine if the cost of complying with proposed rule changes in the first year after the changes 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.					
During the first year after the proposed changes go into effect, will it cost more than \$25,000 for any small business or small city of comply with the change? \Box Yes \checkmark No If yes, identify by name the small business(es or small city(ies).					

Will this proposed plumbing code amendment require any local government to adopt or amend an ordinance or other regulation in order to comply with the proposed plumbing code amendment? \Box Yes \checkmark No If yes, identify by name the government(s) and ordinances(s) that will need to be amended in order to comply with the proposed plumbing code amendment.

Additional supporting documentation may also be attached to this form. Are there any additional comments you feel the Committee/Board may need to consider? If so, please state them here:

Any additional comments are included in the attachment.

Information regarding submitting this form:

- Submissions are received and heard by the Committee on an "as received" basis. Any missing documentation will
 delay the process, and your proposal will be listed as the date it was received "Complete."
- Submit any supporting documentation to be considered, such as manufacturer's literature, approvals by other states, and engineering data electronically to <u>DLI.CCLDBOARDS@state.mn.us</u>. Once your Request For Action form has been received, it will be assigned a file number. Please reference this file number on any correspondence and supplemental submissions.
- For copyrighted materials that must be purchased from publishers, such as published standards, product approvals
 or testing data, listings by agencies (IAPMO, ASSE, ASTM, etc.,) you may send (or email) two copies, along with
 written permission from the publisher to distribute the materials at meetings, via U.S. Mail to: Plumbing Board, c/o
 Department of Labor and Industry, 443 Lafayette Road No., St. Paul, MN 55155-4344.
- For materials that must be submitted by U.S. Mail, please include a copy of your "Request For Action" form originally submitted and reference your assigned RFA file number.

Information for presentation to the Committee and/or Board:

- Limit presentations to 5 minutes or less.
- Be prepared to answer questions regarding the proposal and any documentation.

Information regarding Committee and/or Board function:

• The Plumbing Board or designated Committee.

I understand that any action is a recommendation to the Plumbing Board and is not to be considered final action.

Submitter's Name	Submitter's Email Address	Submitter's Firm Name		
	Anite e enderson@state mn			
	Anita.c.anuerson@state.min.	Mission to Design to a fille all		
Anita Anderson	<u>US</u>	Minnesota Department of Healt	h	
Presenter's name, phone, and	email if different			
Submitter's Mailing Street Add	Iress	City	State	Zip Code
11 E. Superior Street Suite 29	90	Duluth	MN	55802
Submitter's Phone	Submitter's Signature	(original, electronic or typed)	Date	
218-302-6143	Aníta C. Anderson		6/2/25	
For Assistance or question	s on completing this form. c	ontact Mike Westemeier. Dep	artment of L	_abor and
Industry at michael wester	peier@state.mn.us.or.by.nbc	ne 651-284-5898		
moustry at michael.westen	leter @ state.min.us of by pric	JIIE 031-204-3030.		

Proposed Change:

The proposed change is to allow PVC as an approved material for water treatment and/or storage systems. Under the change, in addition to building supply, PVC would be allowed for pipe carrying water from the source of supply (municipal water main, approved drinking water well or approved surface water body) and through any central water conditioning or treatment equipment and/or the last pressure or storage tank prior to the piping that takes water to water heaters, fixtures or other water outlets.

We see multiple ways this change could be addressed in the code:

Option 1:

MATERIALS FOR BUILDING SUPPLY AND WATER DISTRIBUTION PIPING AND FITTINGS					
MATERIAL	BUILDING SUPPLY PIPE AND FITTINGS	WATER DISTRIBUTION PIPE AND FITTINGS	REFERENCED STANDARD(S) PIPE	REFERENCED STANDARD(S) FITTINGS	
Copper and Copper Alloys	x	x	ASTM B42, ASTM B43, ASTM B75, ASTM B88, ASTM B135, ASTM B251, ASTM B302, ASTM B447	ASME B16.15, ASME B16.18, ASME B16.22, ASME B16.26, ASME B16.50 ² , ASME B16.51, ASSE 1061, ASTM F3226, AWWA C606, CSA B242, IAPMO PS 53, IAPMO PS 117	
CPVC	x	x	ASTM D2846, ASTM F441, ASTM F442, CSA B137.6	ASSE 1061, ASTM D2846, ASTM F437, ASTM F438, ASTM F439, ASTM F1970, CSA B137.6, IAPMO PS 53	1
CPVC-AL-CPVC	x	x	ASTM F2855	ASTM D2846	1
Ductile-Iron	x	x	AWWA C151	ASME B16.4, AWWA C110, AWWA C153, AWWA C606, CSA B242, IAPMO PS 53	I
Galvanized Steel	x	х	ASTM A53	AWWA C606, CSA B242, IAPMO PS 53	I
Malleable Iron	x	x	_	ASME B16.3, AWWA C606, IAPMO PS 53	I
PE	X1	_	ASTM D2239, ASTM D2737, ASTM D3035, AWWA C901, CSA B137.1	ASTM D2609, ASTM D2683, ASTM D3261, ASTM F1055, CSA B137.1	-
PE-AL-PE	х	x	ASTM F1282, CSA B137.9	ASTM F1282, ASTM F1974, CSA B137.9	
PE-RT	x	x	ASTM F2769, CSA B137.18	ASSE 1061, ASTM D3261, ASTM F1055, ASTM F1807, ASTM F2098, ASTM F2159, ASTM F2735, ASTM F2769, CSA B137.18	
PEX	x	х	ASTM F876, CSA B137.5, AWWA C904 ¹	ASSE 1061, ASTM F877, ASTM F1807, ASTM F1960, ASTM F2080, ASTM F2159, ASTM F2735, ASTM F3347, ASTM F3348, CSA B137.5	
PEX-AL-PEX	х	х	ASTM F1281, CSA B137.10	ASTM F1281, ASTM F1974, ASTM F2434, CSA B137.10	
PP	X	X	ASTM F2389, CSA B137.11	ASTM F2389, CSA B137.11	
PVC		<u>X</u> ³	ASTM D1785, ASTM D2241, AWWA C900	ASTM D2464, ASTM D2466, ASTM D2467, ASTM F1970, AWWA C907, IAPMO PS 53	1
Stainless Steel	x	x	ASTM A269, ASTM A312, ASTM A554, ASTM A778	ASTM F3226, CSA B242, IAPMO PS 53, IAPMO PS 117	I

Table 604.1 of the 2024 UPC is amended to read:

Notes:

¹ For building supply or exterior cold-water applications, not for water distribution piping

² For brazed fittings only.

³ For exterior cold-water applications, or for interior cold-water applications from the building supply line through any water conditioning or treatment equipment and/or the last pressure or atmospheric storage tank, provided the application is upstream of any water heater or consumer outlet and is protected from hot-water backflow coming from distribution piping

Section 611.3 of the 2020 Minnesota Plumbing Code is amended to read:

611.3 Connection Tubing <u>or Piping</u>. The tubing <u>or piping</u> to and from water conditioning units shall be of a size and material as recommended by the manufacturer <u>or licensed designer</u>. The tubing <u>or piping</u> shall comply with the requirements of NSF 14, NSF 42, NSF 44, NSF 53, NSF 55, NSF 58, NSF 62, or the appropriate material standards referenced in Table 1701.1.

Option 2:

Section 204.0 of the 2020 Minnesota Plumbing Code is amended to read:

Building Supply. Means the pipe carrying potable water from the municipal water supply or source of water supply to a building water meter, pressure tank, or other point of use or distribution on the lot. Building supply means the pipe carrying water from the source of supply (municipal water main, approved drinking water well or approved surface water body) through any central water conditioning or treatment equipment and/or the last pressure or storage tank prior to the piping that takes water to water heaters, fixtures or other water outlets.

	MATERIALS FOR BU	ILDING SUPPLY AND	ATER DISTRIBUTION PIPING AN	D FITTINGS	
MATERIAL	BUILDING SUPPLY PIPE AND FITTINGS	WATER DISTRIBUTION PIPE AND FITTINGS	REFERENCED STANDARD(S) PIPE	REFERENCED STANDARD(S) FITTINGS	
Copper and Copper Alloys	x	x	ASTM B42, ASTM B43, ASTM B75, ASTM B88, ASTM B135, ASTM B251, ASTM B302, ASTM B447	ASME B16.15, ASME B16.18, ASME B16.22, ASME B16.26, ASME B16.50 ² , ASME B16.51, ASSE 1061, ASTM F3226, AWWA C606, CSA B242, IAPMO PS 53, IAPMO PS 117	1
CPVC	x	x	ASTM D2846, ASTM F441, ASTM F442, CSA B137.6	ASSE 1061, ASTM D2846, ASTM F437, ASTM F438, ASTM F439, ASTM F1970, CSA B137.6, IAPMO PS 53	1
CPVC-AL-CPVC	x	x	ASTM F2855	ASTM D2846	
Ductile-Iron	x	x	AWWA C151	ASME B16.4, AWWA C110, AWWA C153, AWWA C606, CSA B242, IAPMO PS 53	I
Galvanized Steel	х	x	ASTM A53	AWWA C606, CSA B242, IAPMO PS 53	I
Malleable Iron	x	x	_	ASME B16.3, AWWA C606, IAPMO PS 53	۱
PE	X1	-	ASTM D2239, ASTM D2737, ASTM D3035, AWWA C901, CSA B137.1	ASTM D2609, ASTM D2683, ASTM D3261, ASTM F1055, CSA B137.1	-
PE-AL-PE	х	x	ASTM F1282, CSA B137.9	ASTM F1282, ASTM F1974, CSA B137.9	
PE-RT	x	x	ASTM F2769, CSA B137.18	ASSE 1061, ASTM D3261, ASTM F1055, ASTM F1807, ASTM F2098, ASTM F2159, ASTM F2735, ASTM F2769, CSA B137.18	
PEX	x	х	ASTM F876, CSA B137.5, AWWA C904 ¹	ASSE 1061, ASTM F877, ASTM F1807, ASTM F1960, ASTM F2080, ASTM F2159, ASTM F2735, ASTM F3347, ASTM F3348, CSA B137.5	
PEX-AL-PEX	х	x	ASTM F1281, CSA B137.10	ASTM F1281, ASTM F1974, ASTM F2434, CSA B137.10	1
PP	X	х	ASTM F2389, CSA B137.11	ASTM F2389, CSA B137.11	
PVC	<u>жі</u> <u>Х</u>		ASTM D1785, ASTM D2241, AWWA C900	ASTM D2464, ASTM D2466, ASTM D2467, ASTM F1970, AWWA C907, IAPMO PS 53	1
Stainless Steel	x	x	ASTM A269, ASTM A312, ASTM A554, ASTM A778	ASTM F3226, CSA B242, IAPMO PS 53, IAPMO PS 117	I

Table 604.1 of the 2020 Minnesota Plumbing Code is amended to read:

Notes:

¹ <u>PE pipe can be used f</u>For building supply, <u>excluding water treatment piping</u>, or exterior coldwater applications, not for water distribution piping

² For brazed fittings only.

611.3 Connection Tubing <u>or Piping</u>. The tubing <u>or piping</u> to and from water conditioning units shall be of a size and material as recommended by the manufacturer <u>or licensed designer</u>. The tubing <u>or piping</u> shall comply with the requirements of NSF 14, NSF 42, NSF 44, NSF 53, NSF 55, NSF 58, NSF 62, or the appropriate material standards referenced in Table 1701.1.

Need and Reasons For the Change. Thoroughly explain the need and why you believe it is reasonable to make this change. During a rulemaking process, the need and reasonableness of all proposed rule changes must be justified; therefore, a detailed explanation is necessary to ensure the Board thoroughly considers all aspects of the proposal.

Need

Confusion around the appropriateness of PVC as a material component of public water system treatment plants requires clarification to prevent undue burden on public water systems. MDH is concerned with the costs of compliance at public water systems, especially noncommunity public water systems that are not typically eligible for Drinking Water Revolving Loans or other public funding.

For the Minnesota Department of Health, the agency with authority for implementing the Safe Drinking Water Act at public water systems, the treatment plant, whether a municipal treatment plant located off-site or a nonmunicipal or noncommunity treatment plant located on the building property, is part of building supply. The plant is part of building supply because whether it is treating for aesthetic contaminants such as hardness or iron, or for health-based contaminants such as nitrate or arsenic, the water is not considered ready for distribution until it has been treated and possibly stored and re-pressurized. This concept is supported by the definition of "entry point" in Minnesota Rules, part 4720.0450 Subp. 6, as a location after any application of treatment but before the water is delivered to any consumer. When the Minnesota Plumbing Code was administered by the Minnesota Department of Health, building supply for public water systems was therefore commonly constructed to extend through any centralized treatment equipment and/or the last pressure or storage tank prior to the piping that takes water to water heaters, fixtures or other water outlets. PVC pipe and fittings were approved for many treatment plants during the years of MDH Plumbing Code administration.

In addition, PVC has been approved under Department of Labor and Industry (DLI) Plumbing Code administration, as shown, for example, in the Report on Plumbing Plans for Plan No. PB-R2303-0177. In this case, DLI allowed the use of PVC piping/fittings in a water treatment system, siting Section 611.1.1, and approving it only for cold water applications.

The recent interpretation of building supply (see <u>PB0172 Final Interpretation.Scott</u> <u>Thompson.7.16.2024</u>) may lead authorities to require replacement of existing PVC components because PVC is only an allowed material for building supply in Table 604.1 of the 2020 Minnesota Plumbing Code (MPC). However, this type of replacement would be costly and provide no benefit to public health or safety.

The plumbing for water conditioning, treatment and storage at public water supplies can involve filter manifolds, backwash control valves, chemical feed systems, flow meters and contact tanks (see Figures 1 and 2). PVC has been proposed and accepted for these public water system applications because it offers substantial benefits over other approved materials. These benefits include:

1) **Corrosion Resistance**: Copper is a regulated contaminant under the Safe Drinking Water Act (SDWA) and copper pipe corrosion can be increased at a chlorine or other chemical injection site as compared to under other water quality conditions.

2) **System Operability**: Surface water treatment equipment, for example, is required to meet design requirements for forward flow and backwash rates. Standard filter heads, primarily designed for the operation of softeners or water conditioning devices that treat the water for aesthetic purposes, often do not accommodate these requirements. PVC offers broader availability of valves and appurtenances needed for proper treatment operations as compared to CVPC.

3) **System Integrity**: For certain treatment layouts such as filter manifolds, PVC's rigidity may provide advantages over more flexible materials like PEX, allowing for neater installations and more secure support of valves, meters, or sampling ports.

4) **Economics**: PVC is more economical than CPVC and is appropriate for cold-water conditions present in treatment systems and atmospheric storage tanks. MDH is concerned with the costs of compliance at public water systems, especially noncommunity public water systems that are not typically eligible for Drinking Water Revolving Loans or other public funding. The cost of CPVC piping, parts and valves can be up to four times that of PVC resulting in a significant burden for small businesses.

Figure 1:



Figure 2:



Reasonableness

Allowing the use of PVC for interior cold-water applications, from the building supply line through water conditioning or treatment equipment and/or atmospheric storage tanks within a public water system, is reasonable based on several factors:

- PVC has a proven track record of performance. Treatment and storage systems using PVC piping, parts and valves have been in place for over 30 years at public water systems without damage or deterioration and have provided for robust system operation. Systems are inspected routinely by MDH.
- PVC meets all the necessary structural and safety requirements for cold water distribution piping. Relevant standards are already included in the 2020 MPC.

ASTM D1785 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

ASTM D2241 Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)

AWWA C900

NSF/ANSI Standards 14 and 61

- PVC is a common material component of NSF certified drinking water treatment units and will therefore be present in water conditioning equipment approved under Section 611 of the Minnesota Plumbing Code.
- The following excerpts from the IAPMO Uniform Codes Answers and Analysis database indicate the PVC piping must be protected from hot water backflow but do not include other concerns with this material. If PVC is only used up to the point of the last atmospheric storage or pressure tank in a water treatment system, there will be adequate protection from hot water backflow.

UPC 2003 IS 8 UPC 2006 IS 8 UPC 2009 IS 8 UPC 2012 IS 8



UPC 2009 Table 6-4 UPC 2012 Table 604.1

Topic: Materials for Building Supply and Water Distribution

Per Table 6-4 (2006/2009) Table 604.1 (2012), and pipe cannot be used for water distribution systems, but could be used for building supply or cold water applications.

- 1. Does this mean that PVC pipe cannot be used inside of buildings at all?
- Can the pipe be used inside of the building if the piping is 1000 NSF 61?
 Can 1000- NSF 61 piping be used for domestic hot water systems? What code section would address this?

1. Yes. PVC water piping is only approved for outdoor use (see IS 8-2006).

No. PVC water pipe and fittings are NSF 61 approved, but are not approved for use inside a building. They are only listed and approved to be used for water service piping outside of a building. Table 6-4 (2006/2009) Table 604.1 (2012) is the section in the code that addresses the limitations of PVC pipe and fittings. The standards listed in chapter 14 and the listings also address the limitations of PVC pipe and fittings.
 No. See Table 6-4(2006/2009) Table 604.1 (2012) and IS 8-2006

UPC 2009 S 7, 2.6.1 and IS 8, 2.7.1 UPC 2012 IS 7, 2.6.1 and IS 8, 2.7.1 UPC 2015 Table 604.1

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Topic: Installation Standards
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What are the reasons for not allowing the installation of PE and EVC under or within a building or structure?

The main reason that it is not allowed within a building is that almost every building has water heating equipment inside the building. When a water heater is heating water and no hot water is being used the hot water can back up into the cold water piping. This can happen when hot water circulating systems are in use also. The pressure rating of all plastic pipes decrease as the temperature of the fluid inside the pipe increases.

Background

While the Plumbing Code provides minimum standards for the plumbing aspects of water conditioning and treatment equipment, MDH has the authority to review plans for public water systems under Minnesota Rules, Chapter 4720 and must ensure that treatment and storage systems provide an adequate quantity of potable water that meets the requirements of the Safe Drinking Water Act. Proper design and operation of these treatment plants is essential to public health protection through the provision of safe drinking water.

Public water systems are classified as either community public water systems (CPWS), serving year-round residents, or noncommunity public water systems (NPWS). NPWS include facilities such as restaurants, campgrounds, and manufacturing facilities.

The source of water supply for NPWS can either be a public water supply well or a surface water source. Groundwater well sources may require treatment to have the water quality meet the standards of the Safe Drinking Water Act (SDWA) (e.g., arsenic or nitrate removal or chlorine disinfection). Surface water sources always require filtration and disinfection treatment to meet requirements of the SDWA. Other NPWS install water conditioning equipment to remove aesthetic contaminants such as hardness or iron.

Treatment systems at NPWS are often located in a building that houses other portions of the facility (e.g., in the basement of a lodge at a resort), although sometimes they may be in a separate building that houses only the treatment system. Sometimes, the treatment systems require atmospheric storage tanks to allow for a consistent flow rate through the treatment process. In other cases, wells require atmospheric storage tanks to make up for low production of the water supply well. In either of these situations, NPWS may have two sets of pumps and pressure tanks: one set to control the well or lake pump and push water through the treatment system or to the atmospheric tanks, and one set downstream of the atmospheric tanks for supplying water to the distribution systems (fixtures and other water outlets). The entire treatment system will be cold water only. See <u>Schematic of a Small Surface Water Treatment Plant</u> as an example.

DEPARTMENT OF LABOR AND INDUSTRY

Division of Construction Codes and Licensing <u>REPORT ON PLUMBING PLANS</u>

PROJECT: Glenmore Resort's Water Treatment Plant, 1017 Glenmore Road, Greenwood Township, St. Louis County, Minnesota, *Plan No. PB-R2303-0177*

OWNERSHIP:Glenmore Resort c/o Paul Hrvol, 1017 Glenmore Drive, Tower, MN 55790**SUBMITTER:**Midwest Water Engineering, 19406 East Bethel Boulevard, East Bethel, MN 55011

Plans Dated: May 2, 2023; Signed by Engineer of Record: May 9, 2023 Initial Date Received: March 23, 2023 Last Date Received: May 10, 2023 Date Approved: May 11, 2023

This review is limited to the provisions of the Minnesota Plumbing Code, Minnesota Rules, Chapter 4714 and assumes the data on which the design is based are correct. Approval is contingent upon meeting the requirements listed below. A copy of the approved plans and this report must be retained at the project location.

INSPECTIONS: The Minnesota Department of Labor and Industry (DLI) will be inspecting the plumbing for this project, including utility installations. Please contact Brad Jensen at 218/290-1591 for all plumbing inspections. No plumbing work may be covered prior to inspection. The installer must verify that the required inspection fee has been submitted before scheduling. A separate permit may be required for interior plumbing and site utilities. For additional information, visit our website at: <u>http://www.dli.mn.gov/business/plumbing-contractors/plumbing-inspections</u>

- 1. All plumbing shall be installed in accordance with Chapter 4714. All pipe, fittings, traps, fixtures, materials, and devices shall be listed or labeled by a third-party listing agency and comply with the applicable standards referenced in the code (see Sections 301.2 and 1701.1).
- 2. Verify that the existing water supply and waste systems are sized for any additional loads/losses (see Sections 610.7 through 610.12 and 703.0). The re-use of existing fixtures is prohibited unless the fixtures conform to the current Minnesota Plumbing Code (see part 4714.0101, subparts 3 and 4).
- 3. No fitting, fixture and piping connection, appliance, device, or method of installation shall be used that obstructs or retards the flow of water unless it is indicated as acceptable or is approved in accordance with Section 301.1 of this code. Verify the treatment system isolation valves/fittings, injection unit, flow sensors, meters, sample points, etc. do not obstruct or impede the flow to an extent detrimental to the system.
- 4. Potable and nonpotable water distribution systems and outlets must be identified per Section 601.3.
- 5. The water treatment installations appear manufactured as a complete system or assembled as such per Section 611.1.1. All wetted surface materials must comply with ASNI/NSF 61 and/or equipment shall comply with the applicable NSF standards as listed in Table 1701.1. Code-complying labeling of all equipment must be per Section 611.1.2.
- 6. The potable water supply tanks, interior tank coatings, and/or liners must comply with NSF 61. The pressurized tanks shall be provided with a listed pressure-relief valve installed in accordance with the manufacturer's installation instructions and discharged per Section 608.5 (see Section 607.2 through 607.5).

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- 7. The atmospheric tanks used for the potable water supply shall be tightly covered and vented in accordance with the manufacturer's installation instructions. Such vents must open downward and be screened with a corrosion-resistant material of not less than #24 mesh. The vent opening must not be in an environment that can contaminate the water supply. The tanks must have an overflow pipe opened downwards with the same screen requirements. The overflow pipe shall be sufficient diameter to permit discharge via air gap of surplus water exceeding the maximum filling rate (see Sections 607.3 through 607.4).
- 8. The receptor or fixture receiving indirect discharge from the conditioning equipment and/or storage tanks must always maintain air gap, be located in the same room, approved by this office, and have shape and capacity to prevent splashing or flooding (see Sections 802.1 and 804.1).
- 9. Indirect waste pipes 5 to 15 feet in length from appliances, devices, or equipment not regularly classed as plumbing fixtures, but which are equipped with drainage outlets, must be trapped, but the traps need not be vented (see Section 803.3). Traps on indirect wastes longer than 15 feet must be vented and such vents may not combine with sewer-connected vents. Indirect wastes less than 15 feet in length may not be smaller than the equipment outlet or ½-inch, whichever is larger.
- 10. Water conditioning equipment must discharge to the drainage system by an air gap per Table 603.3.1, or an air gap device per Table 603.2, NSF 58, or IAPMO PS 65 (see Section 611.2). Pipe and tubing used in water conditioning installations must comply with NSF Standard 14, 42, 44, 53, 55, 58, 62, or the appropriate material standard in Table 1401.1 (see Section 611.3).
- 11. Readily accessible isolation valves installed by a licensed plumber are required for all water conditioning installations. Water conditioning contractors may not install isolation valves, pipes larger than 2-inch, or any connection to the existing drainage system without an air gap (see Minnesota Statutes, Chapter 326B.50).
- 12. Water pressure booster pumps must have a low-pressure cutoff switch within 5 feet from the inlet set at 10 psi minimum (see Section 609.8). A pressure gauge must be located between the shutoff valve and the pump.
- 13. No water, soil, or waste pipe shall be installed or permitted attics, crawl spaces, exterior walls, or outside a building unless necessary and adequate provisions are made to protect from freezing (see Section 312.6).
- 14. Full-way gate or ball valves must be provided at all locations described under Section 606.2, including on the discharge side of the water meter and on each unmetered water supply. Unions shall be installed not more than 12 inches from water heating or regulating equipment, water conditioning tanks, and similar equipment requiring service by removal or replacement (see Section 609.5).
- 15. Pipe hangers and supports shall comply with Section 313.0 and Table 313.3.
- 16. All materials used in potable water systems must meet the requirements of NSF 61 (see Section 604.1). Pipe and fittings with lead content must not exceed 0.25 percent lead in the wetted surface material (see Section 604.2). Solder and flux shall contain less than 0.2 percent lead. Joints must use ASTM B813 non-corrosive non-toxic paste-type flux (see Section 605.1.4).

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- 17. The details appear to reference the use of Schedule 80 PVC in the water systems. Proposed PVC pipe and fittings may be used only as approved for cold water application and must meet ASTM D1785 and NSF 61 (Section 604.1). If CPVC will be used, it must meet Section 605.2 and Table 604.1:
 - a. Pipes must meet ASTM Standards D2846, F441, F442, or CSA B137.6.
 - b. Solvent cement must comply with ASTM F493. Solvent cement requiring the use of primer must be orange. Primer must meet ASTM F656 and be colored. Listed one-step yellow or red solvent cement is permitted for ½-inch through 2-inch ASTM D2846 pipes and ASTM F442 ½-inch through 3-inch pipes only.
 - c. Push-fit fittings must comply with ASSE 1061.
 - d. The installation must include provisions for expansion and contraction (see Section 312.2).
- 18. The plumbing system shall be tested in accordance with Sections 609.4 and 712.0.
- 19. The completed water distribution system shall be flushed and disinfected per Section 609.9.

NOTE(S):

- 1. The scope of this project consists of remodeling an existing facility. The plumbing installation includes a chlorine injection water treatment system with chemical feed/injectors, water filters, flow meters, two pressure potable water storage tanks, two atmospheric potable water storage tanks, and repressurization pumps to the existing water services and distribution systems.
- 2. This facility is served by an existing on-site septic system and an existing private well.
- 3. The licensing authority may require additional plans, information and fee. Changes to the plumbing system may result. Any significant plumbing changes must be approved by this office prior to installation. Contact information for the Minnesota Department of Health (MDH) state and local environmental health offices licensing food, beverage, and lodging facilities can be found at: https://www.health.state.mn.us/communities/environment/food/docs/license/locals.pdf
- 4. The MDH Noncommunity Public Water Supply Unit has reviewed and approved the facility chemical water treatment as a PWS as of March 21, 2023 under Plan No. 230403 and PWSID 5690930.

Authorization may be withdrawn if installation does not begin within one year. Additional requirements may result from changed conditions or additional information.

Approved:

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Zachary D. Barnaal Public Health Engineer Plumbing Plan Review and Inspections Unit 651/284-5888; Zachary.Barnaal@state.mn.us

 cc: Midwest Water Engineering Cartwright Consulting Co. LLC c/o Peter Cartwright P & K Plumbing LLC c/o Phil Mauriala Glenmore Resort c/o Paul Hrvol File