Minutes: Submerged Closed Loop Heat Exchangers Advisory Committee

Date May 31, 2024, 9 – 11:30 a.m.

Location Hybrid Teams Meeting; Orville Freeman Building Room B145, 625 Robert St. N., Saint Paul, MN 55155

Attendees **In Person:** Dan King (Geothermal Professional), Doug Klamerus (Geothermal Professional), Jim Lubratt (Geothermal Professional), Scott Niesen (Minnesota Geothermal Heat Pump Association), Luke Payne (City Representative, alternate)

Virtually: Jay Egg (Geothermal Professional), Jeff Luehrs (Delegated Well Program), Faye Sleeper (Public member), Jeremiah Strode (Geothermal Exchange Organization), David Traut (Certified Representative)

Absent: Tim McCollough (City Representative), Danny Nubbe (Certified Representative), Mike Steffl (Certified Representative)

MDH: Jennifer Weier (WMS Central Region Hydrologist Supervisor), Mark Malmanger (WMS Northern and Southern Region Hydrologist Supervisor), Jon Olson (WMS Technical Unit Supervisor), Avery Guertin (WMS Regulatory Coordinator)

Acronyms and Terms

BTU – British Thermal Unit

DNR – Minnesota Department of Natural Resources

MDH – Minnesota Department of Health

NSF – National Sanitation Foundation

SCLHE – Submerged Closed Loop Heat Exchangers

UMC – Uniform Mechanical Code

UPC – Uniform Plumbing Code

WMS – Well Management Section

Welcome and updates (Avery Guertin, WMS Regulatory Coordinator)

Guertin welcomed and thanked committee members (members) for coming together and continuing to provide valuable feedback on draft possible rules. Luke Payne was introduced as the alternate city representative for Rochester Public Utilities. Future advisory committee meetings are planned for June 10th and June 28th. The agenda for the June 10th advisory committee meeting will include discussion on pressure testing, heat transfer fluid requirements, and other topics as needed. MDH is working on the next rule draft revisions for definitions, permit requirements, and installation requirements. Members will be informed when revisions are posted to the rulemaking webpage.

Members were reminded of the objective to develop rules to "implement requirements for the permitting and installation of submerged closed loop heat exchangers…". MDH is drafting rule language for current and potential future technologies interested in permitting or installing submerged closed loop heat exchangers. Members were asked to consider the needs of current technologies and what may be needed as future technologies come forward.

Guertin reviewed the submerged closed loop heat exchanger definition in Minnesota Statutes, chapter 103I, and as drafted in rule. Additional drafted definitions for a system, piping, and device were presented to members. These definitions are aimed at providing more clarify to the drafted rule requirements. Guertin asked members to consider this language and provide comment.

Guertin described the drafted material requirements as a starting place and asked the expertise of the members to weigh-in on what is reasonable and needed. Members were encouraged to contact MDH if they are interested in discussing possible material requirements that should be considered.

System installation language (Avery Guertin, WMS Regulatory Coordinator)

Subpart 1. Installation.

Item A – B: Members had no comments.

Item C, subitem 2: Guertin asked members if an option to submit by fax is needed. Members responded that they typically do not use fax. Traut requested an option to include text as a means of communication. Purrington suggested using "electronic systems such as…" to be more inclusive to future communication technologies.

Item D: Traut asked for clarification if the language is requiring a backflow prevention device on the fluid loop to prevent contact with potable water. Egg shared make-up water devices have backflow prevention devices. He also suggested clarification to the UPC reference to include "for any potable water connections".

Item E: Luehrs asked for clarification that "fluid" is referring to the heat transfer fluid and not the aquifer. Guertin confirmed the language referring to heat transfer fluid.

Item F: Traut expressed agreement in including a tracer wire requirement. He asked about the importance of requiring marking tape and if this would be used to determine the direction of

fluid flow through piping. Egg shared in his experience marking directional flow is not normally required for buried pipes. He added once the pipe is exposed above the ground surface, the UPC requires markings to show direction of fluid flow. He suggested MDH clarify this language.

Subp. 2. Submerged closed loop heat exchanger device.

Item A: King suggested the authorized materials include “all non-reactive metals”, PVC, and others as referenced in the draft language. Traut shared concerns about limiting the materials for use in a heat exchanger device. He suggested if materials meet the requirements of the UPC and are approved by NSF that they should be included. Weier noted the intent of the draft language presented is to have a starting point for discussion. She also acknowledged the materials list included in the draft language is not inclusive of all materials that may be used and welcomed suggestions from members. She clarified this subpart is about device material requirements which may be different than material requirements for piping. Members discussed temperature considerations for materials and materials included in the UPC and UMC. King expressed agreement in the reference to the UMC and recommended keeping authorized materials as broad as possible. He noted PVC would likely be okay for use in a heat exchanger device considering system operating temperatures. Niesen recommended including HDPE with fusion joints in line 40 of the rule draft language. Sleeper asked if acronyms will be included in the definitions of the rule. Guertin explained that acronyms will be noted in the rule. She also offered to connect with Sleeper after this meeting to discuss the acronyms used during the meeting.

Item B: King recommended striking this item and explained meeting the pressure test should be the requirement, and not the methods used. Niesen asked if the intent is to performance test or material test. King confirmed the intent is to performance test the materials.

Item C: Members discussed draft language and if both minimum pressure rating of 160 psi and 1.5 times maximum observed pressure requirements are needed. Weier added the intent of the language is to address a deeper installation. King noted 1.5 times maximum observed pressure would capture the intent. Lubratt suggested language be revised to state “maximum designed operating pressure”. Members discussed deeper installations and potential for water levels to change. Traut added static pressure would likely not change significantly over time.

Guertin presented the UMC table for hydronic piping and asked members for any concerns about materials referenced. Members noted concerns for lead, ABS, and PVC. Niesen suggested the table is outdated. King noted the table does not include novel materials such as titanium. Traut noted there should be consideration for where these materials would be used (e.g. heat exchanger device, pitless unit, or building). King seconded not conflating the materials. Members discussed if the draft rule should be exclusive rather than inclusive. An example was shared where HDPE should not be used in all instances. King and Niesen seconded the approach to be exclusive rather than inclusive with authorized materials.

Subp. 3. Submerged closed loop heat exchanger piping.

Item A: Traut asked about distinction between DLI and MDH authority over requirements in this subpart. Weier noted this subpart is focused on materials used to circulate closed loop fluids including additives.

Item B: Niesen noted HDPE with fusion joints should also be considered in this subpart. He commented the draft rule seemed to be more prescriptive rather than performance based. Members recommended revisiting language to focus on performance-based requirements.

Traut commented welded joints would not likely occur between the pitless unit and the heat exchanger device. He added recessed, reamed, and drifted couplings (referring to stainless steel couplings) are not easily obtainable and asked members if mechanical joints such as O-lok, certa-lok be included. Traut noted his preference to include because of cross-technology compatibility.

Niesen commented on "submerged closed loop heat exchanger" terminology being nebulous and recommended reconsideration. He suggested the use of the term as written could include work to install systems in a lake. Guertin clarified Minnesota Statute refences to submerged closed loop heat exchangers in water-supply wells. She elaborated the draft rule cannot be written in conflict to the terminology in Minnesota Statute. She recognized concerns expressed previously by members to align terminology with industry-accepted terms such as aquifer-sourced, and suggested more could be added to the definitions to provide more clarity.

Members continued to discuss tables from other codes should be used as a point of reference but cautioned at equal use for all parts of an installation. Klamerus recommended including NSF listed materials for hydronic piping. Members noted piping requirements should be split up into piping in the well and piping from the well to the building.

Item C: Members recommended revising this item to 1.5 times the maximum designed operating pressure.

Item D: King suggested considering authorizing wells in these systems for dual-use. Weier commented MDH's concern is a potential for leak heat transfer fluid and additives into water consumed by people if the well was supplying potable water.

Proposed rule permit language (Avery Guertin, WMS Regulatory Coordinator)

Subpart 8. Termination and removal.

Item A: Egg commented on the 180-day requirement as reasonable, but asked MDH to consider situations in which buildings remain vacant. King suggested using the date of decommissioning versus the date the system stopped being used, which could lead to discretion in determining

whether the system is truly not being used anymore. Weier stated MDH's concern is a person's intent may not reflect what they do.

Item B: Traut expressed concern about commercial buildings being left idle and accurately winterizing the property upon vacancy. He asked how this situation would be handled. King suggested the resolution may be to flush the system on a regular basis.

Guertin asked members to consider if a system owner is no longer around and the responsibility for the system defaults to a property owner if they foresee and issue with vacant buildings. Egg asked about aligning this with existing well rule requirements for unused wells. Weier noted unused wells must be sealed, but the timeframe to do so is not specified in rule. Klamerus commented line 7 in the draft language covers the concern of designating a responsible party.

Traut asked if DNR appropriations permits would be required for these systems. Weier noted DNR has been consulted and a water appropriation permit would not be required for the use of the system. She emphasized water appropriation permitting is not within MDH's authority. Traut clarified his question and asked if MDH would consider reporting like it occurs annually for DNR water appropriation permitting. If so, this could provide an opportunity to track how long a system has gone between pressure testing and illustrate when a system is not in use. Weier noted reporting is currently in statute, but proposed rule doesn't currently include reporting.

Item C: Members had no comments.

'Parking lot' topics of interest

No topics of interest were proposed for discussion during this meeting. Guertin asked members to provide input on how comfortable they are with the current draft rule using the fist to five method. She acknowledged members have not yet seen the pressure test and heat transfer requirements. She also reminded members that MDH is working on another draft rule revision which will take into consideration the suggestions and comments from the past few meetings. These revisions are not yet available for review. Some members commented that if considerations were made from the discussion held during the last few meetings, they are comfortable with the draft rule language.

Lubratt expressed concern about temperature changes over time may largely impact aquifer condition. Members discussed if this could be referred to as thermal pollution. Lubratt suggested a reporting requirement accounting for the thermal balance of the system, including BTU meters and annual reporting to track temperature balance. This would give MDH an idea how much excess heat is transferred to the aquifer. Egg noted there are precedents like this established in New York. In New York, it is required to provide a 20-year model showing no aquifer temperature change. He suggested including thermal modeling as part of the permit application requirement. Traut mentioned understanding the thermal threshold for a system would be helpful.

Guertin opened the discussion to thermal threshold. Committee members expressed interest in knowing thermal modeling during a permit application verses collecting data and reporting results. Egg noted this is like a mechanical permit. King noted modeling may be cumbersome and outside the scope of MDH's authority. Niesen noted every system has modeling and every machine has incoming monitoring and this should be feasible.

Open Forum

Guertin opened the meeting to public comment. There were no attendees representing the public interested in providing comment.

Adjournment

Guertin closed the meeting by reminding members to submit comment and suggested language changes.

Niesen commented legislators may not have recognized the ambiguity of using the terminology "submerged closed loop heat exchangers" and encouraged MDH to consider alternative terminology.

Traut asked if MDH has incorporated comments from previous discussions about cleaning and system maintenance at a future meeting. Guertin noted MDH hopes to have revised rule draft versions available soon. Those revisions will have considered comments received thus far. Traut recommended looking into whether thermal pollution would be a jurisdictional issue under MDH or EPA.

Next meeting June 10, 2024.

Minnesota Department of Health
Well Management Section
625 Robert St. N.
St. Paul, MN 55164-0975
651-201-4600
health.wells@state.mn.us
www.health.state.mn.us/wells

6/7/2024
To obtain this information in a different format, call: 651-201-4600.