Minutes: Submerged Closed Loop Heat Exchangers Advisory Committee

Date March 20, 2025, 9 – 11:30 a.m.

Location Hybrid Teams Meeting; Metropolitan Council, Room 1A, 390 Robert St. N., Saint Paul, MN 55101

Attendees **In Person:** Danny Nubbe (Certified Representative), David Henrich (Advisory Council on Wells and Borings), David Schulenberg (Professional Association), Jeff Luehrs (Delegated Well Program), Jeremy McConkey (Professional Association), Jim Lubratt (Geothermal Professional), Keith Larson (Geothermal Professional), Luke Hollenkamp (City Representative), Ryan SanCartier (Professional Association), Todd Blomstrom (City Representative), Willy Miley (Geothermal Professional)

Virtual: Aaron Meyer (Professional Association), Dave Traut (Certified Representative), Don VanKeulen (Delegated Well Program)

Absent: Jay Egg (Geothermal Professional), Mike Steffl (Certified Representative)

MDH: Teresa Purrington (WMS Section Manager), Jon Olson (WMS Technical Unit Supervisor), Josh Skaar (MDH Rules Coordinator and Legal Counsel), Avery Guertin (WMS Regulatory Coordinator)

Acronyms and Terms

MDH – Minnesota Department of Health

SCLHE – Submerged Closed Loop Heat Exchangers

WMS – Well Management Section

Welcome and introductions (Teresa Purrington, WMS Section Manager)

Purrington expressed appreciation for the advisory committee (committee) for coming together. MDH staff introduced themselves to the committee. Guertin provided facility information to committee members attending in person. Members of the public were asked to reserve comments until the open form at the end of the meeting.

Role of the advisory committee (Josh Skaar, Rules Coordinator and Legal Counsel)

Skaar described the SCLHE rulemaking authority under Minnesota Statutes, Section 103I.208, subdivision 3. MDH may consider expedited rulemaking under this authority. Under this expedited process, the notice of publication must occur before December 31, 2025.

The role of an advisory committee is referenced in Minnesota Statutes, Section 14.101, subdivision 2. Skaar described that MDH retains exclusive authority over the ultimate rule proposal but will consider input from this committee and the public. The advisory committee has an opportunity to provide comments on rules.

SCLHE rulemaking updates and meeting ground rules (Avery Guertin, WMS Regulatory Coordinator)

Guertin provided members with a status update on the SCLHE rulemaking which addresses the permitting and installation of these systems. During the 30-day comment period, after the notice was published in the Minnesota State Register, MDH did not receive any comments or requests for a hearing. This rulemaking received approval from the Office of Administrative Hearings to move forward with rule adoption. Guertin reiterated the statutory authority for SCLHE rulemaking allows for a two-phased approach. The second phase allows for MDH to consider expedited rulemaking after the rules are adopted.

Advisory committee members are expected to serve on this committee as a representative of their constituencies. Committee members are expected to relay recommendations from their constituencies back to the committee. If a committee member is unable to attend a meeting, there is the expectation that the member finds an alternate representative to represent the constituency.

Guertin shared that meeting information, agendas, and minutes are available for viewing on the SCLHE rulemaking webpage (https://www.health.state.mn.us/communities/environment/water/wells/rules/sclherule.html). There is a survey option on the webpage that allows committee members, individuals of their constituencies, and the public to submit suggestions on topics related to SCLHE such as isolation distances and screen configurations.

Committee member introductions

Committee members were asked to introduce themselves and describe their representation on the committee.

Danny Nubbe: certified representative

Dave Traut: joined virtually after committee members did introductions, certified representative

David Henrich: representing the Advisory Council on wells and Borings, also a certified representative

Don VanKeulen: representing a Delegated Well Program, working for Olmsted County

Jeff Luehrs: representing a Delegated Well Program, working for Dakota County

Luke Hollenkamp: representing a city, working for the City of Minneapolis Public Health

Todd Blomstrom: representing a city, working for City of Rochester Public Utilities

Jim Lubratt: representing a geothermal professional, working for SVL

Keith Larson: representing a geothermal professional, working for Schadegg Mechanical

Willy Miley: representing a geothermal professional, working for Darcy Solutions

Aaron Meyer: representing a professional association (Minnesota Rural Water Association)

Dave Schulenberg: representing a professional association (Minnesota Water Well Association)

Jeremy McConkey: representing a professional association (Pipefitters Union)

Ryan SanCartier: representing a professional association (Mechanical Union Representation)

Overview of topic discussion (Avery Guertin, WMS Regulatory Coordinator)

Guertin reiterated the current rulemaking addresses the permitting and installation of SCLHEs. Committee members were provided with an overview of how MDH understands a SCLHE to operate within a water-supply well.

Committee members inquired on why SCLHE are installed in water-supply wells (a specified type of well in Minnesota regulation) and not another category of well, and if there is an option for this well type category to be reassessed during expedited rulemaking. Committee members asked why SCLHE wells are regulated as water-supply wells when they are used differently. Olson shared that the SCLHEs are defined as being installed in water-supply wells in Minnesota Statutes. Revising this definition would not be part of this potential expedited rulemaking. A change to the definition of SCLHEs would need to be addressed in statutory changes.

Guertin discussed the focus of the advisory committee. Part of the expedited rulemaking process included addressing isolation distances and screen configuration requirements. Clarification was added that these topics should focus on the construction and placement of water-supply wells the SCLHEs are installed within.

Committee member discussion

Avery Guertin opened the meeting to hear from committee members on potential challenges with the existing regulation of isolation distances and screen configurations as they relate to the water-supply

well SCLHEs are installed within. Miley requested that members focus discussion on each topic separately. Committee members agreed to start discussions with screen configurations.

Henrich emailed Guertin a document developed by members of the Advisory Council on Wells and Borings. He requested Guertin share the document with committee members. Nubbe caveated this is a working document with unresolved questions. Guertin shared the document showing two well screen configurations in unconsolidated geologic material and a list of questions for consideration.

The following questions, as written in the document Henrich sent Guertin, guided the committee discussion:

- "What is the code intention; to construct single aquifer wells or to not allow screens separated by sumps or risers?"

Henrich stated the well screen configuration for a water-supply well used for a SCLHE differs from conventional water-supply wells because of the piece of well casing (blank) installed between screens. Henrich also shared that Minnesota Rules prohibit the interconnection of different aquifers. If this screen configuration is needed, the screens would need to be constructed within the same aquifer. Miley expressed he does not see any risk in the proposed screen configuration if both screens are within the same aquifer (referring to the screen configuration separated by a blank. Miley explained that in their experience MDH interprets a blank between two screens to be a sump, which results in the need for a variance for some water-supply wells constructed for SCLHEs.

- "If separated screens are constructed within a single aquifer, what risks exist?"

Lubratt asked why the risk for a water-supply well with a SCLHE is different than a conventionally used water-supply well. Henrich described a conventional water-supply well as consumptively using water, creating a cone of depression (where water is drawn-down at some distance from the well). A water-supply well used for a SCLHE does not use water consumptively and does not have the same effect on an aquifer as a conventional water-supply well. While a SCLHE removes water from an aquifer, water drawn into the water-supply well moves past a heat exchanger before discharging water into the same aquifer at a different elevation. Miley shared that field data collected by Darcy Solutions shows a radius of influence from the water-supply well used for a SCLHE only extends a short distance from the well, unlike a conventional water-supply well. Purrington asked Miley if they would be willing to provide these data to MDH to assist with justifying potential changes to rules.

Luehrs asked about how one might properly grout the water-supply wells used for these systems [with screens separated by a blank, in which grout is required for the annular space around the blank for efficiency of the system]. Henrich replied that it can be a challenge to properly grout. Luehrs expressed concern about the fractured Prairie du Chien aquifer and recommended that those sections be grouted with cement grout. Henrich responded that the Prairie du Chien is self-stabilizing and would not need to be screened. Traut added to Luehrs' concern that aquifers have different groundwater qualities at different elevations.

Miley acknowledges that different geologies will require different water-supply well constructions. Wells constructed in unconsolidated material, like sand and gravel, or in softer bedrock formations, such as the Jordan aquifer, would require a split-screen design. Purrington asked how many SCLHE installations required a variance for this type of screen configuration. Miley estimated that about one third of all SCLHE systems require a variance for the screen configuration. Weier added that 13 out of 31 SCLHE permit and permit applications MDH has received require a variance for the split screen construction. Committee members inquired about the length of the blank between the screens. Henrich commented that the design is geology-dependent, but a 20-foot blank is typical.

Traut added that his understanding of the existing rule language is to assure a screen does not interconnect two different aquifers. Henrich and Traut shared that they do not often see use of screen risers in modern well drilling. Screen risers are associated with older cable-tool drilling techniques. Traut requested MDH review rule definitions for antiquated terms and requirements through this rulemaking process.

Vankeulen added that SCLHE systems installed within Olmsted County were in bedrock water-supply wells and did not require a split screen configuration.

Guertin asked if all water-supply wells used for SCLHE constructed in unconsolidated materials require a variance for the screen configuration. Miley confirmed that this is the case. Miley added that the variance process is burdensome and takes 4-6 weeks. Purrington asked for clarity if Miley is talking about the variance process or permitting process, because variances take an average of 22 days to be completed.

Luehrs asked the certified representatives if they see risks with a split screen configuration in an aquifer. Nubbe added that for water-supply wells intersecting geology with an excess of iron and manganese, it could be useful to restrict a portion of the formation with a zero-slot screen or blank. If there are waters with different chemistries mixing, there can be "fouling" in or around the well that may close well components. Miley responded that Darcy has not had a well foul to date, leading to an impact to well function.

Traut shared his experience with constructing water-supply wells in the gravely aquifers of the St. Cloud area. He has seen differences in water chemistry within the same aquifer, which could potentially lead to biofouling and scaling on screens. He added that it could be useful to restrict a portion of the formation by using a zero-slot screen in these types of aquifers.

Blomstrom expressed concern about the change in water chemistry for municipal water systems, because a change in water chemistry results in a needed change to water treatment. He added that he is not aware of research showing vertical mixing of an aquifer will not create a significant change in water chemistry. Miley responded that Darcy has data on this and said it is not a concern. Henrich and Traut added, in agreement, that most municipal water-supply wells pull water from the entire vertical extent of the aquifer that they are completed in.

Committee members asked if SCLHE are continuously pumped. Miley responded that the heat exchanger pumps on demand and would only pump at a continuous high rate at peak heating/cooling demand times.

(Hollenkamp informed the committee that he must leave early but is interested in participating in the conversation about isolation distance requirements.)

Miley shared that installing a screen with a minimal slot size where a blank would be placed could be a work-around to the current regulation and may not need a variance. The low-slot screen effectively prevents water flow into the well. Traut expressed his concern with advocating for solutions that work around current regulation and expressed a desire to update the rules to mitigate this need. Miley added there is a financial component to using a different slot screen because it is more expensive than using a blank. The cost could be triple the cost of using a blank between screens.

- "Should there be annular back fill requirements around the riser section?"

Henrich asks committee members what an appropriate fill for the annular space is surrounding a blank separating screens. He describes current regulations, which are used for wells intersecting confining units, require grout around a blank and advocated for other options. He said a blank in an SCLHE well is not equivalent to a well casing through a confining unit since it is within the same aquifer. Henrich also stated that cement grout can be problematic in these types of applications because it is difficult to control and may plug up a screen. Olson asked the committee members if they have a suggestion on what type of backfill material should be around the blank section of the screen. Traut suggested that at a minimum the blank section should be the same material as the screen as to prevent electrolysis issues. He added that there are a lot of possibilities for the grout or fill material.

Traut and Nubbe shared experiences working with drift aquifers (unconsolidated material) and spoke of challenges with screening fine materials. Traut adds that moving over approximately 30 feet to drill a new borehole can be successful in avoiding a lens of fine material since lenses are not continuous in drift.

Henrich expressed gratitude for this conversation. Luehrs asked if the handout that Henrich shared could be sent to the committee. Olson asked Schulenberg whether this conversation is happening in other states that he represents. Schulenberg responded that Minnesota is having this conversation before many other states. Purrington asked if SCLHEs installed in other states have experienced fouling of the screens. Miley responded that they do not need a variance for the split-screen construction in some other states.

Wrap up

Guertin informed the committee that the next meeting will be held on Thursday, April 3rd, and will focus discussion on isolation distance requirements as they relate to SCLHE. Miley said that he will likely submit additional topics for discussion at the April 14th meeting. Guertin encouraged committee

members and individuals of their constituencies to submit comments or suggestions through the survey form on the SCLHE rulemaking webpage.

Henrich requested that MDH present an overview of isolation distances at the next meeting. Henrich clarified that SCLHE are not water-supply wells for potable use. Miley added an overview on the construction requirements for potable versus non-potable water-supply wells would be helpful. He added that a cross-section diagram of the well construction requirements would be helpful to direct the conversation at our next meeting.

Open forum

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

Adjournment

Next meeting: April 3, 2025, 9 – 11:30 a.m.

Meeting will be held at:

Metropolitan Council
390 Robert St. N., Room LLA
St. Paul, MN 55101
wellrules.mdh@state.mn.us
www.health.state.mn.us

03/28/2025

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