

**Wisconsin Department of Natural Resources
Natural Resources Board Agenda Item**

SUBJECT:

Request that the Board adopt DG-02-13, proposed rules affecting Chapter 280 Wisconsin Statutes related to heat exchange drillhole construction. The proposed rule creates a new requirement that persons drilling heat exchange drillholes must have a heat exchange drilling license. The proposed rules also set construction specifications for heat exchange drillholes that can be approved by notification rather than individual application review. The proposed action implements 2011 Wisconsin Act 150.

FOR: February 2014 Board meeting

PRESENTER'S NAME AND TITLE: Ken Johnson, Water Division Administrator

SUMMARY:

2011 Wisconsin Act 150 created new definitions in Chapter 280, Stats., for heat exchange drillhole and heat exchange drilling, and modified the individual and business license to create a generic drilling license with specific authorization to do well drilling or heat exchange drilling. Wisconsin Act 150 requires that the department establish new criteria and requirements for evaluating individuals' existing heat exchange drilling experience, and establish requirements for attaining and maintaining a heat exchange drilling license. To implement the requirements for the licensing of heat exchange drillers and construction standards for heat exchange drillholes, NR 146 - license registration, and NR 812 - construction requirements, need to be amended.

Revision to the rules should generate little controversy since the Wisconsin Water Well Association worked with the legislature, technical college leaders, other industry representatives, and the department, to promote passage of Wisconsin Act 150 and is in favor of the rule amendments.

Economic impacts of the passage of this rule will be minimal. Actual costs to drillers are small and unlikely to affect decisions to offer a service or enter a business sector. The current water well drilling license is \$50.00 per year for an individual drilling license and/or \$50.00 for the drilling firm business license. The cost is anticipated to be similar to add authorization for heat exchange drilling. Administration of the driller license exam is currently done at no cost to the driller. As a result, actual costs to consumers to use geothermal energy are unlikely to be affected by the licensing and construction requirements.

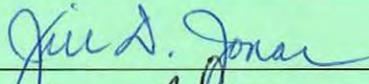
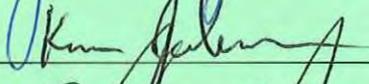
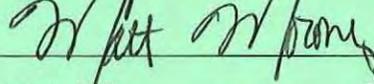
The Natural Resources Board approved the Statement of Scope at its June 2013 meeting. Public hearings were held December 16-17, 2013.

As of April 1, 2015 heat exchange drilling may not be conducted without the required license.

RECOMMENDATION: That the Board adopt DG-02-13.

LIST OF ATTACHED MATERIALS (check all that are applicable):

- | | |
|---|---|
| <input type="checkbox"/> (choose one) | <input checked="" type="checkbox"/> Attachments to background memo |
| <input type="checkbox"/> Statement of scope | <input type="checkbox"/> Governor approval of statement of scope |
| <input checked="" type="checkbox"/> Fiscal estimate and economic impact analysis (EIA) form | <input type="checkbox"/> Environmental assessment or impact statement |
| <input checked="" type="checkbox"/> Response summary | <input checked="" type="checkbox"/> Board order/rule |

Approved by	Signature	Date
Jill Jonas, Bureau Director		1/24/14
Ken Johnson, Administrator		1/29/2014
Cathy Stepp, Secretary		1/28/14

cc: Board Liaison - AD/8

Program attorney - LS/8

Department rule coordinator - LS/8

DATE:

TO: Members of the Natural Resources Board

FROM: Cathy Stepp, Secretary

SUBJECT: Request Adoption of Board Order DG-02-13, affecting chs. NR812 and NR 146, related to heat exchange drilling licensing and construction standards.

Why is the rule being proposed?

2011 Wisconsin Act 150 was prompted by concerns in the drilling industry that current regulation and licensing did not adequately cover the installation of heat exchange drillholes and that inexperienced or even unqualified drillers were doing installations in Wisconsin. The rule is proposed due to concerns that improperly constructed heat exchange drillholes used in geothermal heating/cooling systems could act as conduits for groundwater contamination. The Wisconsin Water Well Association worked with the legislature, technical college leaders, other industry representatives, and the department, to promote passage of Wisconsin Act 150.

Summary of rule

2011 Wisconsin Act 150 created new definitions in Chapter 280, Stats., for heat exchange drillhole and heat exchange drilling, and modified the individual and business license to create a more generic drilling license, with specific authorization to do well or heat exchange drilling. Wisconsin Act 150 requires that the department establish new criteria and requirements for evaluating individuals' existing heat exchange drilling experience, and establish training and continuing education requirements for attaining and maintaining a heat exchange drilling license under the new definitions. To implement the requirements for the new category of heat exchange driller, NR 146 - license registration, and NR 812 - construction requirements, need to be amended to address heat exchange drilling.

How does this affect existing policy?

No license requirement or specific construction standards are currently codified for heat exchange drilling projects. Individual approval subject to general well construction and groundwater protection standards are currently required prior to constructing any heat exchange drilling project.

Development of specific construction standards for vertical heat exchange systems could allow the department to streamline the approval process. Establishing specific construction standards for heat exchange drillholes by rule could allow the typical low-risk systems to proceed with installation more quickly by no longer requiring the owners to wait for DNR approval.

The new licensing requirement continues the state policy to protect groundwater and ensure safe drinking water, as well as protect consumers and enhance the availability of alternate sources of energy for heating and cooling, by proper construction of heat exchange drillholes by licensed professionals.

Has the Board dealt with these issues before?

The Natural Resources Board approved the Statement of Scope at its June 2013 meeting.

Who will be impacted by the proposed rule? How?

The rule revisions could affect people and businesses involved with drillhole construction, as follows:

1. All drillers who construct heat exchange drillholes will benefit from specifications approved by rule for most standard drillhole construction rather than individual review of all heat exchange drillholes.
2. Wisconsin-licensed water well drillers who currently install or want to begin installing heat exchange drillholes will need to obtain authorization for heat exchange drilling.
3. Wisconsin-based installers of heat exchange drillholes, who do not hold a water well drilling license, will need to obtain a Wisconsin driller license with heat exchange drilling authorization;
4. Drillers licensed in another state who currently install or want to install heat exchange drillholes in Wisconsin will need to obtain a Wisconsin driller license with heat exchange drilling authorization;
5. People with no drilling experience who want a heat exchange driller license will need to be trained and obtain the required level of experience in order to obtain a drilling license with heat exchange authorization.
6. Consumers will benefit by reduced risk of drinking water contamination and reduced risk of costly repair in the event of improper drilling.

Information on Environmental Analysis

No environmental analysis is needed. The rule helps avoid the potential for environmental impacts and is highly unlikely to have a material impact on the human environment.

Economic and Small Business Analysis.

Economic impacts of this rule are minimal. Actual costs to drillers are small and unlikely to affect decisions to offer a service or enter a business sector. The current water well drilling license is \$50.00 per year for an individual drilling license and/or \$50.00 for the drilling firm business license. The cost is anticipated to be similar to add certification for heat exchange drilling. Administration of the driller license exam is currently done at no cost to the driller.

As a result, actual costs to consumers to use geothermal energy are unlikely to be affected by the licensing and construction requirements.

Overall economic impacts are uncertain. Additional protection of groundwater through consistent, high quality drilling practices should reduce future costs of drinking water treatment or groundwater clean-up. Consistent high quality heat exchange drilling practices should help contain the cost of this alternative source of energy for heating and cooling.

No public comments were received on the draft economic impact analysis and no impacts to small business are anticipated.

**NR 146 and NR 812 Revision Comments & Responses to Public Hearing
Comments
Natural Resources Board Order No. DG-02-13**

January 15, 2014

This document presents a summary of public comments received on the proposed revisions of Chapters NR 146 and NR 812, Wisconsin Administrative Codes, and the Department responses. Numbered comments indicate related comments on the same topic by more than one commenter.

PROCESS SUMMARY

The draft code changes were approved to go to public hearing by the Wisconsin Natural Resources Board on October 23, 2013. The draft code was made available for public review from December 2nd, through December 20th, 2013. The hearings were public noticed in the usual manner. Two days of public hearing were held on the proposed code changes as follows: December 16th, 2013 in Madison, Milwaukee, Wausau and Ashland, and December 17th, 2013 in Madison, Green Bay, Eau Claire and La Crosse. Hearings were held in conjunction with Natural Resources Board Order No. DG-03-13.

COMMENT SUMMARY

A total of 20 people attended the eight public hearings; four persons testified on the record regarding DG-02-13 and the Department received five e-mails in addition to the Clearinghouse Report to the Agency regarding DG-02-13. Of the 20 hearing attendees, three indicated general support of the draft code changes and one indicated opposition to the draft code changes.

COMMENTS AND RESPONSES

Comment:

Did you discuss a protocol for qualifying or licensing existing heat exchange drillers? I did not see one addressed.

Response:

Experienced heat exchange drillers and water well drillers experienced in constructing pressure grouted wells will qualify to take the examination because they can meet the requirements of NR146.04(5). All existing or new heat exchange drillers must pass the qualifying examination to be licensed. Continuing education and examinations will be offered on multiple dates in January through March 2015 so that licenses can be issued prior to the April 1, 2015 effective date of the license requirement.

Comment:

SECTION 25 146.06 (b) Out of state HE drillers: Is there a mechanism to allow for reciprocity? Meaning, if drillers are allowed to come to Wisconsin to drill under

these protocols (which I agree with), is there a mechanism to allow us to travel to surrounding states under the same or similar conditions?

Response:

The Department has no authority to require reciprocity by rule in states other than Wisconsin. No reciprocity agreements are in place with other states at this time. Each state has the option to evaluate Wisconsin licensing standards and allow a Wisconsin licensed driller to qualify for a license in that state. The department will respond promptly and fully to any inquiries about reciprocity from other states.

Comment:

*SECTION 38 NR 812.03 (5) Change wording to: "Heat exchange drillers shall confirm that the project does not fall within a wellhead protection area or within 400' of a municipal well. (**It appears that a variance is required for HE drillholes that are located within that 400')."*

Response:

The Department proposes changing the language to: "Heat exchange drillers shall contact the local water supply utility and shall confirm that the project does not fall within a wellhead protection area or within 400 feet of a municipal well."

The rule proposal requires that if a project is within 400 feet of a municipal well location, a geothermal project application form must be filled out and advance written approval received prior to construction, as is done for all projects currently. For all other projects within the wellhead protection area, the requirement is simply for advance notice to and consultation with the water utility so that both parties are aware of the construction and any special conditions that may be encountered.

Comment:

- 1. SECTION 47 NR 812.09(4)(x) strike 10 or more HE drillholes. Change 4,000' to 5,000'*
- 2. NR 812.09(4)(x) The construction of ~~10 or more~~ heat exchange drillholes or where the sum of the depths of all heat exchange drillholes is greater than ~~4000~~ 5000 feet, for a single drilling site.*
- 3. Change to total footage of 5000 ft.*

Response:

The effect of striking "or more" would result in the Department only reviewing applications for construction of exactly 10 heat exchange drillholes, which is not reasonable. The Department proposes to maintain the numbers initially proposed, which is 10 or more drillholes or 4000 feet of vertical drillhole. Risk of groundwater contamination increases as the number of drillholes increases and the project area and depth of drillholes increases. The intent of the proposal is to eliminate advance individual review for the typical single-family home and smaller commercial projects. Analysis of the 796 approved projects over the last 4 ½ years shows that only 131 of the 796 projects had 10 or more drillholes, or only 16.5%. The Department's initial proposal would reduce the number of Department reviewed projects by over 80%. The time required to obtain advance written approval for all heat exchange projects in 2013 year

averaged around 5 days from receipt of the application. The amount of time required for an individual Department review would likely go down if the rule is approved.

Note: Conditions that warrant variation from the original design would require consultation with the department, including a change to the number or length of drillholes such that that advance individual approval is needed.

Comment:

SECTION 54 (or wherever it is applicable) add, "For the construction of heat exchange drillholes, thermoplastic pipe meeting the minimum requirements of sub.(3) may be temporarily or permanently installed and used as a conduit to drill through (?to protect against caving formations?). The thermoplastic pipe may terminate in bedrock for heat exchange drillholes. The thermoplastic pipe must be grouted in the same manner as the heat exchange drillhole at that same depth prior to the construction of the lower drillhole or left in place until after the heat exchange drillhole has been grouted.

Response:

Language to allow temporary thermoplastic casing will be added but not to allow permanent installation of thermoplastic pipe. The department agrees that thermoplastic pipe may be used as a temporary casing to drill through a caving formation, but all reasonable effort must be expended to remove the pipe after the drillhole is completed. This pipe is not intended to be part of the final installation and is not a normal part of a heat exchange drillhole. The rule requires that the thermoplastic pipe be removed whenever physically possible because it is more prone to act as a conduit for surface contaminants.

Comment:

SECTION 51 NR 812.10(12)"...shall be pressure tested according to manufacturer recommendations..."...delete the pressure gauge affixed to both ends portion. Delete the air/water portion. (i.e. if you have 400' loop that is filled entirely with air, you could have a substantial leak and after 2 hours, you would never know it. It might take days or weeks for your tire to go flat! Since you cannot compress a liquid, a water-filled loop will show a problem very quickly. ALSO, what is the acceptable loss result of watching this loop for an hour? 1%? 5%? 10%? There will be some diminishing of pressure as the poly stretches over time. The requirement as written can also cause problems.

Response:

The department agrees that the gauges affixed to both ends of the loop are not necessary or standard practice during pressure testing - this will be modified in the rule. The original requirement was an advisory suggestion included in the draft for discussion purposes. The department agrees that water or fluid should be used in the loops during the pressure test and this has been added in the rule. In NR812.10 (12) air or potable water has been changed to water or fluid and the language regarding a pressure gauge at both ends has been removed.

Comment:

NR 812.17 (1) (c) Diameter uniformity. What is the purpose of this requirement?

Response:

This section only allows casing pipe of the same diameter to be connected together. The reference to "and heat exchange drillholes" is not correctly placed in this section and has been removed.

Comment:

1. *SECTION 59 NR 812.18 (3) change or add, "Field created u-bends are allowed."*
2. *Section 59. Proposed NR 812.18 (3) stipulating the welding requirements and, in particular, factory fusion for the U-Bend joint for heat exchange piping.*

Response:

Following discussion with advisors, field created u-bends are in common use in the industry. The Department agrees that field created u-bends can be allowed as long as pressure testing is conducted. The sentence requiring factory fused u-bends has been removed. The original requirement was an advisory committee suggestion included in the draft for discussion purposes and advisors agree on the final outcome.

Comment:

*SECTION 64 NR 812.20 Define continuous...
Also, somewhere it needs to be addressed that if sodium bentonite (20% solids) grout is used, the mud weight prior to grouting should be less than 9.2 pounds per gallon. Less is better. Heavier mud will result in ribboning or floating of grout and more subsidence.*

Response:

Any dictionary definition of continuous, as in not stopping, is adequate and no further specificity is practical for purposes of the rule. In long-standing practice, the term has been used to include the preparation and mixing of the grout as well as actual grouting of the drillhole. Regarding the sodium bentonite comment, the rule has been modified as follows: "Drilling fluid should be less dense than grout used to seal the drillhole to facilitate proper sealing of the drillhole."

Comment:

Is approval required for a loop field at a school?

Response:

A loop field at a school does not automatically require advance individual approval. The size of the project determines whether notification or advance individual approval is required. DG-02-13, as currently proposed, requires that all projects drilling more than 10 drillholes, drilling more than 4000 feet of drillhole, or drilling drillholes greater than 400 feet deep or within 400 feet of a municipal well are required to submit an application for review and must obtain approval before any drilling begins. A school project that met any of these proposed thresholds would be required to obtain approval before drilling could begin; if not, notification would be necessary.

Comment:

Are materials for heat exchange drillholes defined?

Response:

The current department approval requirement for reviewing and approving all materials used in a well or drillhole is applied to heat exchange materials in DG-02-13 at NR812.11. Under the proposed rule, all products used in a well or drillhole must be pre-approved for use and must already be on the list of approved products. The loop piping was not addressed in the hearing draft of DG-02-13. The proposal has been modified by adding "loop pipe" in the sections applying to other types of pipe, including general requirements in 812.17(1) and defective pipe in 812.17(2)(c) to address loop pipe specifications.

Comment:

Other issues that may be addressed include sizing, installation technique, make-up water for drill mud and grout, multiple loops per hole, remediation issues if a private well is affected

Response:

The department is moving away from individual project reviews to focus on outreach and inspection of projects under construction. Trained and licensed professionals and contractors are responsible for project specifications. Sizing and installation techniques that do not have the potential to affect groundwater will be left up to the trained professional installers and contractors to set on each project.

NR 812.12(11) addressed the issue of a safe water source being used in the construction of a well or drillhole.

The rule allows a single loop per drillhole. Multiple loops per drillhole is not a standard practice and would require advance individual review and approval from the department.

Remediation of a private well affected by a geothermal drillhole is the specific responsibility of the driller and must be resolved between the private entities. The department may be consulted if the quality of the drinking water in the private well is affected.

Comment:

Madison Water Utility supports the following changes in CR 13-096:

Section 38. Proposed NR 812.03 (5) requiring contact with the local unit of government for any heat exchange bore hole installation proposed within a Wellhead Protection Area or within 1200 feet of a municipal well

Section 47. Proposed NR 812.09 (4) (x), (y), and (z) mandating Departmental review and approval for installations with 10 or more drillholes, a drillhole depth greater than 400 feet, and a drillhole within 400 feet of a municipal water supply well, respectively.

- Section 51. Proposed NR 812.10 (12) requiring pressure testing of heat exchange loops following installation.
- Section 59. Proposed NR 812.18 (3) stipulating the welding requirements and, in particular, factory fusion for the U-Bend joint for heat exchange piping.
- Section 73. Proposed NR 812.26 (8) which requires a filling and sealing report submitted to the Department at the time of abandonment.

Response:

These sections will be retained, except see the comment regarding u-joints. The department appreciates your support.

Comment:

1. *The City of Madison Water Utility further recommends revised language that would require each heat exchange drillhole to be geo-located. Section 67 – proposed NR 812.22 (7) – would require a well construction report for every 20 drillholes drilled. This requirement may be deemed sufficient to understand underlying geology in the area; however, the absence of a requirement to geo-locate each drillhole presents problems decades ahead when these boreholes will need to be abandoned.*
Our experience with improperly abandoned private domestic wells in the City shows the challenges associated with tracking down wells when there is little documentation or poor records from the time of original installation. Furthermore, members of the utility's Water Quality Technical Advisory Committee, which includes individuals from the Wisconsin Geological Survey and Wisconsin State Laboratory of Hygiene and a retired Wisconsin Department of Natural Resources hydrogeologist, have shown strong support for this additional requirement which would not be expected to place a significant burden on the driller.
2. *I am concerned that the proposed rule revisions to NR 812 Wisconsin Administrative Code in regard to geothermal wells may be inadequate. It is my understanding that there is no provision in the draft rule that would require the geo-location of geothermal wells when they are installed. I believe this is a serious omission.*

Response:

The department agrees with the use of GPS devices to geo-locate all wells and drillholes to a more accurate location coordinate so that abandonment can be more easily accomplished in the future and unwanted site disturbance can be avoided. The rule proposal has been modified as follows at section NR 812.22(7): Heat exchange drillholes require one construction report for each 20 drillholes drilled, including latitude and longitude of the corresponding drillhole location. Latitude and longitude for each drillhole at a project site is required to be reported for heat exchange projects requiring approval under s. NR 812.09(4).

Comment:

The utility recommends adding a requirement in Section 68 – proposed NR 812.22 (9). In particular, we would stipulate that in addition to only department approved heat exchange fluids, that when the installation is located within a wellhead

protection area or within 1200 feet of a municipal well that the fluids would be of a "non-toxic" nature.

Response:

The department already reviews all heat exchange fluids for toxicity, including consultation with the Wisconsin Department of Health Services as needed, and will not approve a product for use if it does not pass this review.

Comment:

1. *The heat exchange licensing process also needs to include alternatives to obtaining geothermal licensing, such as graduating from the geothermal drilling program currently offered by Gateway Technical College.*

It would be a travesty if an ill-advised set of regulations decimates all the effort that has gone into turning Gateway into a geothermal leader and model for the rest of the US. It would also jeopardize their opportunity to become a regional center for geothermal training and the several million dollars in funding from the National Science Foundation that would entail.

2. *Currently as written, there is no way to become a licensed driller without apprenticing under a currently licensed driller or drilling firm.*

Response:

The department supports educational efforts to improve knowledge and expertise in the heat exchange drilling industry. In consultations with Gateway Tech and other advisors, the department has developed a way to acknowledge professional development done at programs such as Gateway. The department has amended the proposed section NR 146.04(5) (a) 2. as follows: Nonpotable pressure grouted wells, including pressure grouted environmental monitoring wells constructed under ch. NR141, qualify toward for the requirements of this section. Experience obtained in formal degree or apprenticeship programs approved in advance by the department and that otherwise meets the requirements of this section qualify toward the requirements of this subsection.

Note: The department will maintain a list of formal degree or apprenticeship programs providing experience that meets the requirements of this section on its webpage at dnr.wi.gov.

Comment:

Installations done by untrained drillers and not trained installers may have potential issues, such as hole placement and grout hydration problems, and may also be oversized to cover the installers lack of geothermal specific knowledge, at the expense of the homeowner.

Response:

The department concurs with the concern expressed that potential issues may occur from installations done by untrained drillers and installers. The department and the industry share the concern about groundwater contamination; and the industry is concerned about heating and cooling project performance. Heating and cooling performance is not within the scope of this rule and is the responsibility of trained

professional installers and contractors. Other than required location parameters for groundwater protection, hole placement and system sizing will be left up to the trained professional installers and contractors to set on each project.

The department requires that all products, including grout, be approved products and required to be mixed to rule specifications, or where none is specified to manufacturer's product specifications.

Department field staff does inspect a percentage of drilling project sites to evaluate the drilling and grouting. Should field staff encounter a situation that does not meet ch. NR 812 standards, they have the authority to require modifications on-site to correct any substandard job. Recurring problems will be addressed in continuing education, enforcement cases or future standard-setting.

Comment:

NR 146.07(3) – That through continuing education current drillers wishing to receive or maintain a geothermal endorsement on their license will have to take six hours of continuing education. Personal experience has shown that conference attendees don't typically pay close attention and are just there to get their credits. Many are doing other things during the presentation. With no testing at the end or no working lab component to test the information presented, this will not elevate the knowledge.

Response:

While this issue is beyond the scope of the rule, the department agrees that there may be individuals who do not always take full advantage of the learning situations and information presented in training programs. DNR strives to improve our programming for continuing education and welcome suggestions from the heat exchange industry. Testing to ensure attendance and to increase the effectiveness of the continuing education program will be considered. Recurring testing to maintain license is not required for water well drillers where the risk to health and groundwater is higher so it does not seem appropriate to require recurring testing as a condition of licensing for heat exchange drillers.

Comment:

Most water well drillers are working with very large, high horsepower, drilling rigs and this is not necessary for installation of many systems. Access to smaller sites is limited and may exclude smaller sites or backyard installations.

Response:

This issue is beyond the scope of the rule. The rule does not limit the use of a smaller drilling rig for use in specific circumstances and locations that warrant its use. The department always encourages use of the right tool for the job.

Comment:

1. *Supports recommendation for tracer wire to indicate the laterals.*
2. *Tracer wire recommendation.*

Response:

In consultation with industry advisors, the department does not find that there is a standard practice for effective installation of tracer wire. The requirement for GPS location of all drillholes for larger projects will accomplish what we understand to be the intent of this comment.

Comment:

Various comments on grammar or punctuation in the document.

Response:

Each suggestion has been reviewed for applicability and corrections have been made where mistakes in grammar, punctuation or similar problems were found.

Comment:

Comments on form, style, references, punctuation and clarity were received from the Legislative Council Rules Clearinghouse.

Response:

All changes suggested by the Legislative Clearinghouse have been made with the exception that the phrase "and affecting small business," is not added to the relating clause. The determination that small businesses are not affected was made at the beginning of the rule process based on the following factors: (1) the majority of those involved in the drilling aspect of heat exchange systems are either already licensed or eligible to be licensed at no cost as of the effective date of the license requirement; (2) the rule proposal simplifies the current regulatory process for more than 80% of projects; and (3) the construction standards set in the rule are the same as the current conditions of the currently-required written approvals. No comments indicating a small business effect were received during review of the economic impact analysis, the public hearing process, or from the Small Business Environmental Council.

ADMINISTRATIVE RULES Fiscal Estimate & Economic Impact Analysis

1. Type of Estimate and Analysis

Original Updated Corrected

2. Administrative Rule Chapter, Title and Number

Chapters NR812 and NR146, Wisconsin Administrative Code

3. Subject

Heat Exchange drilling licensing and construction standards

4. Fund Sources Affected

GPR FED PRO PRS SEG SEG-S

5. Chapter 20, Stats. Appropriations Affected

20.370(4)(ma)

6. Fiscal Effect of Implementing the Rule

No Fiscal Effect Increase Existing Revenues Increase Costs
 Indeterminate Decrease Existing Revenues Could Absorb Within Agency's Budget
 Decrease Cost

7. The Rule Will Impact the Following (Check All That Apply)

State's Economy Specific Businesses/Sectors
 Local Government Units Public Utility Rate Payers
 Small Businesses (if checked, complete Attachment A)

8. Would Implementation and Compliance Costs Be Greater Than \$20 million?

Yes No

9. Policy Problem Addressed by the Rule

Potential for drinking water or groundwater contamination as a result of inexperienced or unqualified drillers constructing heat exchange drillholes

10. Summary of the businesses, business sectors, associations representing business, local governmental units, and individuals that may be affected by the proposed rule that were contacted for comments.

Well drilling businesses are anticipated to be the primary affected business sector. Many drillers are represented by the Wisconsin Water Well Association whose representatives participate in the advisory work group. Local governments may be positively impacted by reduced risk of drinking water or groundwater contamination.

11. Identify the local governmental units that participated in the development of this EIA.

The Madison Water Utility provided comments as part of the advisory work group for rule development.

12. Summary of Rule's Economic and Fiscal Impact on Specific Businesses, Business Sectors, Public Utility Rate Payers, Local Governmental Units and the State's Economy as a Whole (Include Implementation and Compliance Costs Expected to be Incurred)

Economic and fiscal impacts of this rule are anticipated to be minimal (final determination of impact will follow public comment period). Actual costs to well drillers are small and not expected to affect decisions to offer a service or enter a business sector. The current water well drilling license fee is \$50 and the heat exchange drilling license fee is expected to be set at the same level (total compliance cost to industry is estimated at \$500). Drillers may take the licensing exam and apply to construct heat exchange drillholes at no cost. The rule does not propose fees for either of these state services as the total cost to the state is small (total implementation cost is estimated at \$7300).

13. Benefits of Implementing the Rule and Alternative(s) to Implementing the Rule

Benefits of implementing the rule include reduced potential for drinking water and groundwater contamination as a result of improper construction of heat exchange drillholes. No alternatives to implementing the rule are apparent as the statute prohibits heat exchange drilling without a license as of April 1, 2015.

14. Long Range Implications of Implementing the Rule

Long range implications include reduced potential for drinking water and groundwater contamination as drillers are licensed and receive continuing education annually on advances in heat exchange drilling. While the overall economic impact is uncertain, the rules are anticipated to result in less potential for impact on drilling costs, property values or water supply costs.

ADMINISTRATIVE RULES Fiscal Estimate & Economic Impact Analysis

15. Compare With Approaches Being Used by Federal Government
No approaches are currently being used by the federal government.

16. Compare With Approaches Being Used by Neighboring States (Illinois, Iowa, Michigan and Minnesota)
ILLINOIS: In Illinois, the Department of Public Health is responsible for oversight of the well construction code, and has authority over the location, construction and modification of closed loop wells. A small set of standards specifically covers construction of closed-loop wells. The Department of Public Health's Closed Loop Well Contractors Certification Board oversees the rules, licensing and administration. A closed loop certification is required for drillers and is issued to those who are qualified and have passed the exam. The initial examination fee is \$50 and annual renewal fee is \$25. Licensees must attend one continuing education session in the preceding 2 years for license renewal.

IOWA: Iowa is in the process of developing rules, but has no rules codified for heat exchange drilling at this time. Iowa has a well drilling code and a well driller certification. Fee is \$400 initially and \$300 for renewal. License is for a two-year period and requires 16 contact hours of continuing education.

MICHIGAN: Michigan has no codified rules at this time, but has guidelines for heat exchange systems. Michigan has a Water Well Drilling Contractor license, but no requirements for heat exchange drillers. Water well driller license fee is \$40.

MINNESOTA: In Minnesota, the Commissioner of Health is responsible for oversight of the well construction code. The code includes regulations for groundwater thermal exchange devices. Minnesota has a license for a certified well contractor and a separate license for constructing vertical heat exchangers. Fees for well contractor licenses range from \$75 to \$250. Fees are required for construction of vertical heat exchangers, ranging from \$235 to \$700.

17. Contact Name Randell Clark	18. Contact Phone Number 608-267-7895
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This document can be made available in alternate formats to individuals with disabilities upon request.

ADMINISTRATIVE RULES Fiscal Estimate & Economic Impact Analysis

ATTACHMENT A

1. Summary of Rule's Economic and Fiscal Impact on Small Businesses (Separately for each Small Business Sector, Include Implementation and Compliance Costs Expected to be Incurred)

2. Summary of the data sources used to measure the Rule's impact on Small Businesses

3. Did the agency consider the following methods to reduce the impact of the Rule on Small Businesses?

- Less Stringent Compliance or Reporting Requirements
- Less Stringent Schedules or Deadlines for Compliance or Reporting
- Consolidation or Simplification of Reporting Requirements
- Establishment of performance standards in lieu of Design or Operational Standards
- Exemption of Small Businesses from some or all requirements
- Other, describe:

4. Describe the methods incorporated into the Rule that will reduce its impact on Small Businesses

5. Describe the Rule's Enforcement Provisions

6. Did the Agency prepare a Cost Benefit Analysis (if Yes, attach to form)

- Yes No
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**ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD
REPEALING, RENUMBERING, AMENDING, REPEALING AND RECREATING, AND CREATING
RULES**

The Wisconsin Natural Resources Board proposes an order to **amend** NR 146 (title) 146.01(1) and (2), 146.02(3) and (4), 146.03 (1) and (2) (intro.), (2) and (3), 146.04(1)(a) and (1)(d), 146.05 (title), (1) and (2), 146.07(1)(a), (b) and (e), (2), (3) and (4), 146.08, 146.08(1), 146.09, 146.09(2), NR 812.01(2), 812.03, 812.04(1), 812.08, 812.08(4), 812.09(4), 812.09(4)5, 812.09(4)5(q), (5), (6), 812.10, 812.10(2), (3), (4), (5), (6), (8), 812.11, 812.11(2), (2)(g), 812.12, 812.12(15), 812.17, 812.17(2)(b) and (2)(d)4, 812.20(2)(c), (2)(j), (3)(a), (3)(b) and (7), 812.22(7)(b), 812.26, 812.26(2)2. and 3., 5., 5.(b)2, 812.26(2)5(c)1, (7)(b) and (8), NR 812.43; to **repeal and recreate** NR 146.03(2)(a) and (b); to **create** NR 146.01 (1) (note) and (note), NR 146.02(1m), (4d), (4h), (4p), (4t) and (11), 146.03(2)(e) and (2)(f), 146.04 (1) (a) (note) and (note), (5), (6) and (7), 146.065, 146.07(1) (f), (g) and (h), (2) (b), (c) and (d), 146.08(8), (9), (10), (11), (12) and (13) NR 812.03(5), NR 812.07(50p) and (50s), NR 812.08(5), NR 812.09(4)5(x), 812.10(12), 812.20(1)7, 812.20(1)7(c)1, (1)7(d)1, (1)7(e), (1)7(f), (1)7(g) and (1)7(h), 812.22(9), 812.26(7)(a)7 relating to licensing criteria for heat exchange drillers and to standards for heat exchange drillholes that will be approved with notification rather than individual review.

DG-02-13

Analysis Prepared by the Department of Natural Resources

1. Statutes interpreted:

Sections 227.11 and s. 280.11(1), Wis. Stats.

2. Statutory authority:

Sections 280.15 (2m)(b)1., and s. 280.15(2m)(f)2m.b, Wis. Stats.

3. Explanation of agency authority:

Section 280.11(1), Wis. Stats., grants authority to the department to, among other things, establish all safeguards necessary in protecting public health against the hazards of polluted or impure water supplies. Specifically, s. 280.15(2m)(b)2., Wis. Stats., requires compliance with licensing, training and education requirements promulgated by the department by rule for heat exchange drilling. Wisconsin Act 150 will become effective 36 months after publication, or April 1, 2015, at which time heat exchange drilling cannot be done without a license.

4. Related statutes or rules:

Chapter 280 – Pure Drinking Water, provides definitions for terms, defines the powers of the department, and lays out well drilling registration, licensing and qualification requirements and fees for such. It also defines certain prohibitions and exceptions, local authority and defines penalties and citations.

Chapter NR 146 – Well Driller and Pump Installer Registration, provides definitions, registration requirements, defines the requirements for the initial application and registration conditions. It also defines requirements for out-of-state drillers, renewals and the registrant responsibilities, as well as license suspension and revocation criteria.

Chapter NR 812 – Well Construction and Pump Installation, provides a general section covering purpose, applicability, cooperation with the department, contracts for noncomplying installations, disposal of pollutants and injection prohibition, drinking water standards, definitions and location criteria, and additional sections on new well construction and reconstruction requirements, requirements of new pump installations and water treatment, standards for existing installations, and variance conditions.

5. Plain language analysis:

The proposed rule would create the specific requirements for heat exchange drilling to help protect sources of drinking water as well as consumers while enhancing the availability of alternate sources of energy for heating and cooling. The Department proposes to issue a single drilling license with authorizations available for either water well or heat exchange drilling or both. Construction requirements for heat exchange drilling will be proposed in the rule.

The proposed order includes provisions in NR146 for obtaining and maintaining authorization to construct heat exchange drillholes, including:

1. sets a minimum length and type of drillhole that a person must have constructed in order to demonstrate eligibility to test for the drilling license and heat exchange authorization;
2. requires continuing education in order to maintain a drilling license and heat exchange authorization;
3. identifies knowledge that will be the basis for written testing.

The proposed order includes provisions in NR812, setting specifications for heat exchange drillholes that are approvable with notification and will not automatically require individual application and review. Specifications include:

1. number and depth of drillholes;
2. setbacks from contamination sources or water supply wells;
3. equipment;
4. drilling and sealing aids;
5. reporting and consultation procedures;
6. abandonment procedures.

6. Summary and comparison with existing and proposed federal regulations.

No federal regulations currently apply to private firms engaged in drilling and installation of heat exchange drillholes.

7. Comparison of similar rules in adjacent states:

ILLINOIS: In Illinois, the Department of Public Health is responsible for oversight of the well construction code, and has authority over the location, construction and modification of closed loop wells. A small set of standards specifically covers construction of closed-loop wells. The Department of Public Health's Closed Loop Well Contractors Certification Board oversees the rules, licensing and administration. A closed loop certification is required for drillers and is issued to those who are qualified and have passed the exam. The initial examination fee is \$50 and annual renewal fee is \$25. Licensees must attend one continuing education session in the preceding 2 years for license renewal.

INDIANA: Indiana has a well construction code and requires a water well driller license. Geothermal heat pump wells are addressed very briefly in the well drilling code. No license is required for heat pump well drilling.

IOWA: Iowa is in the process of developing rules, but has no rules codified for heat exchange drilling at this time. Iowa has a well drilling code and a well driller certification. Fee is \$400

initially and \$300 for renewal. License is for a two-year period and requires 16 contact hours of continuing education.

MICHIGAN: Michigan has no codified rules at this time, but has guidelines for heat exchange systems. Michigan has a Water Well Drilling Contractor license, but no requirements for heat exchange drillers. Water well driller license fee is \$40.

MINNESOTA: In Minnesota, the Commissioner of Health is responsible for oversight of the well construction code. The code includes regulations for groundwater thermal exchange devices. Minnesota has a license for a certified well contractor and a separate license for constructing vertical heat exchangers. Fees for well contractor licenses range from \$75 to \$250. Fees are required for construction of vertical heat exchangers, ranging from \$235 to \$700.

OHIO: Ohio has requirements for well construction, but no requirements for heat exchange drillholes at this time. Ohio has a well driller registration process and a \$250 annual fee.

8. Summary of factual data and analytical methodologies:

Instances of drinking water and groundwater contamination have occurred in Wisconsin as a result of improper heat exchange drilling. 2011 Wisconsin Act 150 was prompted by concerns in the drilling industry that current regulation and licensing did not adequately cover the installation of heat-exchange drillholes and that inexperienced or even unqualified drillers were doing installations in Wisconsin. The Wisconsin Water Well Association took the lead in working with the legislature, other industry representatives, and the department, to promote passage of Wisconsin Act 150.

9. Analysis and supporting documents used to determine effect on small business or in preparation of an economic impact analysis:

The current water well drilling license is \$50.00 per year for an individual drilling license and/or \$50.00 for the drilling firm business license. The cost is anticipated to be the same to add certification for heat exchange drilling, so a licensed driller with both certifications would pay a total of \$100. Administration of the driller license exam is currently done at no cost to the driller. No complaints of economic hardship or business impacts have been received during the collection of existing license fees. Neither the Wisconsin Water Well Association, representing many affected drillers, or individual drillers participating in the advisory committee to rule development, have expressed any concern about the impact of proposed fees.

10. Effect on small business:

Economic impacts of this rule will be minimal. Actual costs to drillers are small and unlikely to affect decisions to offer a service or enter a business sector. As a result, actual costs to consumers to use geothermal energy are unlikely to be affected by the licensing and construction requirements.

Overall economic impacts are uncertain. Additional protection of groundwater through better drilling practices may reduce future costs of drinking water treatment or groundwater clean-up.

11. A copy of any comments and opinion prepared by the Board of Veterans Affairs under s. 45.03 (2m), Stats., for rules proposed by the Department of Veterans Affairs: [if not applicable, so state]

Not applicable.

12. Agency Contact (include email and telephone number):

Randell Clark
Bureau of Drinking Water and Groundwater
P.O. Box 7921
Madison, WI 53707-7921
Randell.clark@wisconsin.gov
608-267-7895

SECTION 1. Chapter NR 146 (title) is amended to read:

Chapter NR 146 ~~WELL WATER WELL~~ DRILLER, HEAT EXCHANGE DRILLER AND PUMP INSTALLER LICENSING AND REGISTRATION; DRILLING RIG OPERATOR REGISTRATION

SECTION 2. NR 146.01 (1) is amended to read:

146.01 (1) PURPOSE. This chapter is promulgated under chs. 280 and 281, Stats. The purpose of this chapter is to establish the criteria by which the department administers the water well driller, heat exchange driller and pump installer licensing and registration program and water well and heat exchange drilling rig operator registration program required by ch. 280, Stats.

SECTION 3. NR 146.01 (1) note) and (note) are created to read:

Note: The standards for water well drilling, heat exchange drilling and pump installing are in ch. NR 812.

Note: The department intends to issue a single license or registration document indicating which type or types of wells or drillholes for which the holder is authorized.

SECTION 3. NR 146.01 (2) and (note) are amended to read:

NR 146.01 (2) APPLICABILITY. This chapter applies to any individual or person, firm, corporation or partnership engaging in, or intending to engage in, the business of water well drilling, heat exchange drilling or pump installing in the state of Wisconsin. ~~This~~ The license requirements of this chapter does do not apply to water well drilling or pump installing activities involving a well supplying water which is not used for, or intended to be used for, human consumption or the washing or preparation of food or pharmaceutical products.

Note: Any person constructing a water well, or heat exchange drillhole or installing a pump, regardless of whether he or she that person is required to be licensed or registered under this chapter, is required to comply with applicable statutory and administrative code requirements laws and rules and with any plans, specifications, variance and approvals approved by the department for water well construction, heat exchange drilling and pump installation. For example, ch. NR 812 contains water well construction and pump installation requirements for private and noncommunity water systems and heat exchange drillhole construction and chs. NR 408 810 and 811 contain water well construction and pump installation requirements for public community water systems.

SECTION 4. NR 146.02 (1) is renumbered NR 146.02 (1r).

SECTION 5. NR 146.02 (1g) is created to read:

NR 146.02 (1g) "Certificate of supervision" means a department form, signed by the owner of a water well drilling, heat exchange drilling or pump installing business and by the licensed supervisory individual water well driller, heat exchange driller or pump installer, which assigns supervisory, legal, financial and compliance responsibilities for a registered water well drilling, heat exchange drilling or pump installing business.

SECTION 6. NR 146.02 (3) and (4) are amended to read:

NR 146.02 (3) "Direct supervision" means actual physical presence and supervision by a Wisconsin registered licensed individual water well driller during all water well drilling activity, activities, by a Wisconsin licensed individual heat exchange driller during all heat exchange drilling activities or by a Wisconsin registered licensed individual pump installer during all pump installing activity activities.

NR 146.02 (4) "Engage in the business of" includes advertising, bidding, contracting, preparing plans and specifications, supervising well drilling or pump installing activities, performing well drilling or pump installing activities, billing or receiving payment for work done water well drilling, heat exchange drilling or pump installing activities.

SECTION 7. NR 146.02 (4c) and (note), (4g) and (note), (4n), (4r), (4w) and (7m) are created to read:

NR 146.02 (4c) "Heat exchange drillhole" has the meaning specified in s. 280.01 (2b), Stats.

Note: Section 280.01 (2b), Stats., defines "heat exchange drillhole" to mean "an excavation or opening in the ground that is deeper than it is wide, that extends more than 25 feet below the ground surface, and that is made for the purpose of installing a geothermal closed-loop heat exchange system."

NR 146.02 (4g) "Heat exchange drilling" has the meaning specified in s. 280.01 (2c), Stats.

Note: Section 280.01 (2c), Stats., defines "heat exchange drilling" to mean "the industry and procedure employed in making heat exchange drillholes."

NR 146.02 (4n) "Heat exchange drilling rig operator" means an individual registered with the department to operate a drilling rig for the construction of heat exchange drillholes under the general or direct supervision of a licensed individual heat exchange driller.

NR 146.02 (4r) "Heat exchange registrant" means a person registered to engage in the business of heat exchange in Wisconsin under the supervision of a licensed individual heat exchange driller.

NR 146.02(4w) "Licensed heat exchange driller" means an individual who has obtained a license pursuant to s. 280.15 (2m), Stats. and s. NR 146.04, as a heat exchange driller and has paid the annual license fee under s. 280.15 (2m) (c) 1., Stats.

NR 146.02(7m) "Under the supervision" means employed by a licensed individual or by a registered person, employing or contracting with a licensed supervisory individual, who is legally and financially responsible for compliance with all applicable laws and rules and any plans, specifications, variances and approvals approved by the department and has advance and specific knowledge of water well drilling, heat exchange drilling, pump installing or well filling and sealing activities.

SECTION 8. NR 146.03 (title) and (1) are amended to read:

NR 146.03 Registration License or registration. (1) REQUIRED. No ~~individual or person, firm, corporation or partnership~~ may engage in the business of water well drilling, heat exchange drilling or pump installing, or hold himself, herself or itself out as or act temporarily or otherwise as a water well driller, heat exchange driller or pump installer, in the state of Wisconsin without first obtaining either a water well driller, heat exchange driller or pump installer license or registration from the department.

SECTION 9. NR 146.03 (2m) is created to read:

NR 146.03(2m) EXCEPTIONS FOR HEAT EXCHANGE LICENSING AND REGISTRATION.

(a) A Wisconsin individual heat exchange driller license is not required for any of the following:

1. An individual performing heat exchange drilling on real estate owned or leased by that individual, but the heat exchange work shall comply with the applicable laws and rules and with any plans, specifications, variances and approvals approved by the department.

2. An individual who is employed by a licensed individual heat exchange driller.

3. An individual who is employed by a person that is registered as a business to perform heat exchange drilling.

(b) A Wisconsin water well driller business registration is not required for any of the following:

1. An individual who is a licensed heat exchange driller who does not operate as a corporation, partnership or LLC.

2. An individual performing heat exchange drilling on real estate owned or leased by that individual, but the well and the work done on the well shall comply with the applicable laws and rules and with any plans, specifications, variances and approvals approved by the department.

3. An individual who is employed by a licensed individual water well driller

4. An individual who is employed by a person that is registered as a business to perform heat exchange drilling.

SECTION 10. NR 146.03 (3) is amended to read:

NR 146.03 (3) PERFORMANCE STANDARDS. All ~~water~~ well drilling, heat exchange drilling and pump installing work shall conform to statutory and administrative code requirements and any department approved plans and specifications or variance comply with applicable laws and rules and any plans, specifications, variance and approvals approved by the department.

SECTION 11. NR 146.04 (1) (a) is amended to read:

NR 146.04 (1) (a) GENERAL REQUIREMENTS. (a) All new license and registration applications shall be submitted on forms provided specified by the department for this purpose. An applicant for a heat exchange drilling rig operator registration shall be at least 18 years old. An applicant for an individual heat exchange driller license shall be at least 20 years old.

SECTION 12. NR 146.04 (1) (a) (note) and (note) are created to read:

Note: Pursuant to 29 CFR 570.58 and Hazardous Occupations Order #7, persons under the age of 18 are not lawfully permitted to operate a power-driven hoisting apparatus.

Note: Specified application forms will require on-line submittal after development of necessary information technology and training during continuing education.

SECTION 12. NR 146.04(1)(d) is amended to read:

(d) Registration The license or registration shall be effective on the date the permit license or registration is issued by the department and expires on December 31 of each year. Registrants Licensees and registrants shall inform the department within 15 business days of any changes in the information on the application submitted to the department, including any change in status or ability of the licensed individual supervisory water well driller, licensed individual supervisory heat exchange driller or licensed individual supervisory pump installer to perform their supervisory responsibilities.

SECTION 13. NR 146.04(2)(e), (4)(d), (5), (6) and (7) are created to read:

NR 146.04 (2)(e) If the applicant holds a current heat exchange driller license, the applicant is not required to submit an additional fee to become a licensed water well driller.

(4)(d) If the applicant holds a current heat exchange driller registration, the applicant is not required to submit an additional fee to become a registered water well driller.

NR 146.04 (5) HEAT EXCHANGE DRILLER LICENSE.

(a) To be eligible to take the exam for an individual heat exchange driller license, an applicant shall meet all of the following requirements:

1. Has been a registered heat exchange drilling rig operator for at the least 2 years within the 5 years before the date of applying for an individual heat exchange driller license.

2. Within the 5 years immediately prior to the date of applying for an individual heat exchange driller license, has completed a minimum of ten heat exchange drilling projects totaling at least 5000 feet of heat exchange pressure grouted drillhole or has completed a minimum of 30 pressure grouted wells including a minimum of 2500 feet of pressure grouted casing. Nonpotable pressure grouted wells, including pressure grouted environmental monitoring wells constructed under ch. NR 141, qualify toward the requirements of this subdivision. Experience obtained in a formal degree or apprenticeship program approved in advance by the department may qualify toward the requirements of this subdivision.

Note: The department will maintain a list of formal degree or apprenticeship programs providing experience that meets the requirements of this subdivision.

3. Was the individual who operated the drilling rig performing all the heat exchange well drilling activities during the period of the drilling experience under subd. 2. To fulfill this requirement all heat exchange drillholes included on the application shall be constructed in accordance with all laws and rules including reporting, and any department-approved plans, specifications, variances and approvals.

4. Submit a completed application that includes the following information regarding the heat exchange drilling experience under subd. 2.: the name, address and signature of the supervisory heat exchange driller, the dates during which a heat exchange drilling rig operator registration was held, a description of the heat exchange drilling activities performed, the names of well owners, their addresses and phone numbers, the legal descriptions of the locations of the heat exchange drillholes, the dates the heat exchange drillholes were constructed, the types and hours of activities for which the supervisory heat exchange driller was present, and a recent photo of the applicant operating a heat exchange or water well drilling rig in which the applicant's face can be seen clearly.

5. For a period of 3 months prior to the date of applying for an individual heat exchange driller license has provided the department with at least 24-hour notice before starting any heat exchange drilling activities as a heat exchange drilling rig operator in accordance with a letter from the department.

6. Has no record of any unlicensed heat exchange drilling activities after April 1, 2015 during the experience period listed on the individual heat exchange driller license application.

7. Has no unresolved violations, judgments, court or administrative orders or settlements from previous heat exchange drilling activities in Wisconsin and has no violations that were repeated following notice from the department.

8. Has attended the department sponsored or department sanctioned continuing education for heat exchange drillers during the experience period under sub d. 1.

9. For applications submitted after January 1, 2020 has met department approved training requirements specific to heat exchange drilling.

10. Meet with a department staff member to review and sign a list of compliance expectations. The applicant will receive the license at the conclusion of the meeting.

(b) If the applicant meets the requirements of par. (a), and receives a notice of eligibility from the department, the applicant may take an exam administered by the department to demonstrate ability, understanding and competency to engage in the business of heat exchange drilling in Wisconsin.

Note: The department will solicit exam topics and questions from licensed heat exchange drillers.

(c) If the applicant passes the exam under par. (b), the applicant shall submit the license fee of \$50 in order to obtain an individual heat exchange driller license. If the applicant holds a current water well driller license, the applicant is not required to submit an additional fee to become a licensed heat exchange driller.

(d) If the applicant fails to take and pass the exam under par. (b) within 2 years of receiving a notice of eligibility from the department, the application is void.

NR 146.04 (6) HEAT EXCHANGE DRILLER BUSINESS REGISTRATION.

(a) All persons engaging in the business of heat exchange drilling in Wisconsin are required to obtain a business registration for each place of business or retail outlet.

(b) To be eligible for a business registration to engage in the business of heat exchange drilling, the applicant shall meet all of the following requirements:

1. At least one of the following conditions shall be met:

- a. The person operating the business is an individually licensed heat exchange driller.
- b. An individually licensed heat exchange driller has an ownership interest in the business.
- c. An individually licensed heat exchange driller is employed by the business.
- d. The business contracts with an individually licensed heat exchange driller.

2. The licensed individual heat exchange driller under subd. a. is available to provide adequate general and direct supervision of heat exchange drilling activities and has signed a certificate of supervision for the heat exchange drilling business registration as part of the application.

3. The licensed individual heat exchange driller and any registered business for which the heat exchange driller is or was the supervisory heat exchange driller has a pattern of practice that complies with heat exchange drilling laws and rules.

4. The licensed individual heat exchange driller and any registered business for which the driller is or was the supervisory heat exchange driller has no unresolved violations, judgments, court or administrative orders or settlements related to water well drilling, heat exchange drilling, or heat exchange well filling and sealing and has no violations that were repeated following notice from the department, and has no outstanding well construction reports, water samples or well filling and sealing reports from the past five years.

5. The licensed individual heat exchange driller has previous heat exchange drilling experience with the drilling methods, grouting methods and types of machines that will be used by the business registration applicant.

(c) A completed business registration application for each place of business or retail outlet, signed by both the designated supervisory licensed individual heat exchange driller and the owner of the business, shall be submitted by the applicant to the department with the \$50 registration fee. If the applicant holds a current registration to engage in the business of water well driller drilling, the applicant is not required to submit an additional fee to become registered to engage in the business of heat exchange drilling.

(d) If requested by the department, the business owner shall meet with a department staff member to review and sign a list of compliance expectations. The business owner will receive the registration at the conclusion of the meeting.

(6) The designated supervisory licensed individual heat exchange driller is responsible for ensuring that heat exchange drilling and heat exchange drillhole filling and sealing work performed by the business and its employees is conducted in compliance with all applicable laws and rules and with any plans, specifications, variances or approvals approved by the department. The designated supervisory licensed individual heat exchange driller may be held legally and financially responsible for any corrections needed to noncomplying heat exchange work or noncomplying heat exchange drillhole filling and sealing work. The registered heat exchange drilling business may also be held responsible for such corrections. The designated supervisory licensed individual heat exchange driller shall have advance and specific knowledge of the heat exchange drilling and filling and sealing activities of all individuals which they are responsible to supervise.

(7) No individual or person may engage in the business of water well filling and sealing without either a water well drilling license or registration, or a pump installer license or registration.

NR 146.04 (7) HEAT EXCHANGE DRILLING RIG OPERATOR REGISTRATION

(a) To be eligible to become a registered heat exchange drilling rig operator, the applicant shall have no unresolved violations, judgments, court or administrative orders or settlements from previous water well drilling, heat exchange drilling or filling and sealing activities in Wisconsin, shall have no outstanding well construction reports, water samples or filling and sealing reports from the past five years and shall not have engaged in the business of drilling without a license within the past two years.

(b) An individual who seeks registration as a heat exchange drilling rig operator shall apply to the department on a form specified by the department. The individual shall include an application fee of \$25. If the individual has a current water well drilling rig operator registration in effect, the applicant does not need to submit an additional fee to become a registered heat exchange drilling rig operator. If an individual has a current heat exchange drilling rig operator registration in effect the applicant does not need to submit an additional fee to become a registered water well drilling rig operator.

(c) In order to retain registration as a heat exchange drilling rig operator an individual shall comply with the requirements for continuing education in s. NR 146.07(3). The individual shall apply for registration renewal and pay a fee of \$25 annually on or before January 1. If the individual has paid the fee for a water well drilling rig operator registration for the same calendar year the applicant does not need to submit an additional fee to renew the heat exchange drilling rig operator registration.

(d) An individual who files an application for registration renewal or who pays the required annual fee after January 1 shall pay a late penalty of \$15.

(e) Registered heat exchange drilling rig operators may not engage in the business of heat exchange drilling, except for performing heat exchange drilling activities.

(f) An individual who is not a licensed heat exchange driller or a registered heat exchange drilling rig operator may only perform heat exchange drilling if the individual is employed by a licensed individual heat exchange driller or a registered heat exchange drilling business and is under the direct supervision of a licensed heat exchange driller or a registered heat exchange drilling rig operator who is on site during all heat exchange well drilling activities.

SECTION 14. NR 146.05 (title), (1) and (2) are amended to read:

NR 146.05 Registration License and registration conditions and emeritus.

(1) **CONDITIONS.** The department may condition a well driller or pump installer license, registration or renewal issued under this chapter based on the experience, and qualifications, equipment and compliance history of the applicant or of the licensed individual supervisory driller. Conditions which may be imposed by the department include prior department notification of well drilling or pump installing activities restriction of water well drilling or heat exchange drilling to specific methods, equipment or geologic formations, or advance notification to the department of water well drilling, heat exchange drilling, pump installing or filling and sealing activities.

(2) **EMERITUS STATUS.** A Wisconsin registered water well or heat exchange driller or pump installer licensed under this chapter may request to be listed with the department as an emeritus if the well driller or pump installer is no longer engaged in the business or businesses for which a Wisconsin registration is held the license was obtained. An emeritus is not required to earn the continuing education credits described in s. NR 146.07 and shall continue to receive codes, bulletins or other documents prepared and printed by the department.

SECTION 15. NR 146.065 is created to read:

NR 146.065 (b) Out of state heat exchange drillers. Heat exchange drillers who hold an individual license to construct heat exchange drillholes in states other than Wisconsin are eligible to obtain an individual Wisconsin heat exchange driller license if all of the following requirements are met:

1. The department determines that the heat exchange well drilling construction standards and licensing laws and rules in effect at the time the applicant was licensed in at least one of the states in which the applicant is currently licensed were substantially similar to Wisconsin's.
2. The applicant is in good standing in all states in which the applicant is or was licensed or registered to drill heat exchange drillholes.
3. The applicant demonstrates competency to engage in the business of heat exchange drilling in Wisconsin by passing an exam administered by the department.
4. The applicant submits a completed application which is true and accurate and an application fee of \$50 to the department. If the applicant holds a current Wisconsin water well driller license the applicant does not need to submit an additional fee to become a Wisconsin licensed heat exchange driller.

SECTION 16. NR 146.07(1) (a), (b) and (e) are amended to read:

NR 146.07 Renewals. (1) APPLICATION. (a) To renew an individual or business a license or registration, the licensee or registrant shall submit a true and complete renewal application to the department on or before January 1 of each year. The department may require that proof of compliance with continuing education credit requirements under sub. (2) sub (3) be submitted with the renewal application.

(b) Renewal applications shall be submitted on forms specified by the department and accompanied by a fee of \$50 for each water well driller or heat exchange driller license or registration and \$25 for each pump installer license or registration and each water well or heat exchange drilling rig operator registration. Only one \$50 fee is required if the same licensee holds both a water well driller or heat exchange driller license. Only one \$50 fee is required if the same registrant holds both a water well driller or heat exchange driller registration. Only one \$25 fee is required if the same registrant holds both a water well drilling rig operator registration and a heat exchange drilling rig operator registration.

(e) A renewal is effective on the date the licensee or registrant receives a permit from the department and expires on December 31 of each year.

SECTION 17. NR 146.07(1) (f), (g), (h), (i) and (j) are created to read:

NR 146.07 (1) (f) A drilling rig operator registration expires when the individual becomes a licensed individual driller.

(g) A drilling rig operator registration is not valid unless the rig operator is employed by a driller licensed or a drilling business registered for the type of drilling designation held by the rig operator.

(h) The renewal application for a business registration shall be signed by both the licensed supervisory individual driller and the owner of the drilling business.

(i) The renewal application for a registered drilling rig operator shall be signed by the rig operator's employer.

(j) The department may require registered businesses and their licensed supervisory individuals to complete and submit an updated certificate of supervision with a renewal application.

SECTION 18. NR 146.07 (2) is repealed and recreated to read:

NR 146.07 (2) ELIGIBILITY.

(a) Only individuals holding valid Wisconsin licenses or registrations on December 31 who have met the continuing education credit requirements of this section are eligible for renewal in the following year.

(b) An individual whose license or registration is not in effect on December 31, due to any of the following reasons, is not eligible to renew the license or registration:

1. Failure to attend continuing education.
2. Failure to renew during the calendar year.
3. Department of revenue hold on license, registration or renewal lasting longer than one calendar year for failure to pay state income taxes.
4. Department of family services hold on license, registration or renewal lasting longer than one calendar year for failure to pay child support.
5. Suspension lasting longer than one calendar year.

(c) If a license or registration is not renewed because of the reasons under par. (b), the individual whose license or registration is not renewed must take and pass the appropriate exam and comply with s. NR 146.04(5)(a)7. to become licensed again.

(d) If a water well or heat exchange license is not renewed for 5 or more years, the applicant shall meet the requirements in effect for obtaining a new water or heat exchange driller license.

(e) Only registered persons who have a licensed supervisory individual who has met the continuing education credit requirements of this section are eligible for renewal in the following year.

SECTION 19. NR 146.07 (3) and (note) and (4) are amended to read:

NR 146.07 (3) CONTINUING EDUCATION. Each calendar year, licensed and registered persons individuals shall earn six continuing education hours by attending training continuing education sessions sponsored or sanctioned by the department. At least 6 hours each year shall be earned by attending department sponsored or sanctioned education sessions. Continuing education hours shall be earned between January 1 and December 31 of each year. Continuing education hours shall be earned beginning January 1, 1989 for water well drillers and pump installers, beginning January 1, 2009 for registered water well drilling rig operators and beginning January 1, 2016 for licensed heat exchange drillers and registered heat exchange drilling rig operators. Continuing education hours are not required during the first calendar year in which an individual becomes licensed or registered for the first time, except that registered water well drilling rig operators or registered heat exchange drilling rig operators shall earn continuing education hours during the year in which they are first licensed or registered if they include their first year as a drilling rig operator toward their experience to obtain the applicable drilling license.

Note: The department will consult with water well drillers, heat exchange drillers and pump installers in developing continuing education programs. One of the department sponsored training continuing education sessions for water well drillers and pump installers will be held in conjunction with the annual Wisconsin Water Well Association meeting conference.

NR 146.07 (4) ENGAGING IN BUSINESS. ~~A An individual or person or business applying for a renewal under this section may not engage in the business of water well drilling, heat exchange drilling or pump installing after a permit license or registration has expired until he or she the individual or person has received a renewed well driller or pump installer license or registration from the department.~~

SECTION 20. NR 146.08 (title) and (intro.), (1), (3), (4), (5), (6) and (7) are amended to read:

NR 146.08 Registrant Licensee and registrant responsibilities. All water well driller, heat exchange driller and pump installer registrants licensees and registrants and registered water well drilling and heat exchange rig operators shall do all of the following if applicable to the individual's license or person's registration:

NR 146.08 (1) Perform work in compliance with, and ensure that work performed under their supervision is conducted in compliance with, all applicable statutory and administrative code requirements and any department approved plans and specifications, or variance laws and rules and with any plans, specifications, variance and approvals approved by the department and perform work in a sanitary manner.

(3) Complete any corrections ordered by the department on for any water well construction, heat exchange drilling, or pump installation or filling and sealing for which the licensee or registrant performed work on, supervised work on or signed a well construction report for. Water well drillers shall be responsible for corrections relating to well location, construction and reconstruction. Heat exchange drillers shall be responsible for corrections relating to the construction of heat exchange drillholes. Pump installers shall be responsible for corrections relating to the pump installation. Water well drillers, heat exchange drillers and pump installers shall be responsible for correcting their well or drillhole filling and sealing violations.

(4) Submit any report or form required to be submitted by statute, administrative rule applicable laws and rules and with any plans, specifications, variances and approvals or order orders in the time period required and notify the department of any change in information submitted on water well driller, heat exchange driller or pump installer license, registration and renewal applications. Reports and forms shall be complete, true and accurate.

(5) Clearly identify the name, and license or registration number of the licensed supervisory individual or the registered person, firm, corporation or partnership in all advertising, estimates, invoices and receipts and on any water well drilling rig, heat exchange drilling rig, pump installation truck or similar equipment. The identification on equipment shall be at least 2 inches in height with at least 1/4 inch wide brush stroke. The identification shall have a sharp color contrast with the background on which it is applied. The identification shall remain legible and maintained without deterioration.

(6) Refuse to contract for water well drilling, heat exchange drilling, or pump installing or filling and sealing for, or lease or lend water well drilling, heat exchange drilling or pump installing equipment to, an unlicensed individual or unregistered person, firm, corporation or partnership without having an employee/employer relationship and without directly supervising the water well drilling or pump installing activities of the unlicensed individual or unregistered person, firm, corporation or partnership, and,

(7) Refuse to contract for water well drilling, heat exchange drilling, or pump installing or filling and sealing for, or lease or lend water well drilling, heat exchange drilling or pump installing or filling and sealing equipment to, a an individual or person whose license or registration has been suspended or revoked well driller or pump installer without having an employee/employer relationship and without directly supervising the water well drilling, heat exchange drilling, or pump installing or filling and sealing activities of the individual or person whose license or registration was suspended or revoked well driller or pump installer.

SECTION 21. NR 146.08 (8), (9), (10), (11), (12), (13), (14) and (15) are created to read:

NR 146.08 (8) Licensed individual drillers shall provide direct supervision on the first 10 water wells and first 10 heat exchange drillholes drilled by any employee or any individual which the licensed driller is responsible to supervise, if the employee or individual has no water well drilling or heat exchange drilling experience, has no experience in a water well drilling or heat exchange drilling method which is new to that employee or individual or has no experience in a grouting method which is new to that employee or individual.

(9) Verify that the appropriate well notification, county well location permit, department approval and/or variance has been obtained before commencing any well construction or reconstruction.

(10) Be legally and financially responsible for correcting any noncomplying work not corrected by individuals or persons which the licensee or registrant supervises or employs.

(11) Have advance and specific knowledge of work being done by any individual for whom they are providing direct supervision.

(12) Be adequately equipped to perform water well drilling, heat exchange drilling, pump installing and well filling and sealing in compliance with applicable laws and rules and with any plans, specifications, variances and approvals approved by the department.

(13) Ensure that either a licensed water well driller or a registered water well drilling rig operator is on site at all times during water well drilling activities. The licensee or registrant shall ensure that either a licensed heat exchange well driller or a registered heat exchange drilling rig operator is on site at all times during heat exchange drilling activities.

(14) For water wells and pump installations, ensure that the work is performed in a sanitary manner.

(15) Water well drillers, heat exchange drillers, pump installers and well constructors shall, when requested by the department, give notice to the department as specified in the notice of request at least one department work day prior to the day upon which any well construction or

reconstruction or any part thereof, any filling and sealing operation or the installation of any pumping equipment, will be commenced.

SECTION 22. NR 146.09 (1), (2) and (3) are amended to read:

NR 146.09 (1) BASES FOR ACTION. The department may suspend or revoke a well driller or pump installer license or registration under this chapter for any of the following reasons:

(a) ~~A~~ The licensee or registrant made a material misstatement in the application for a license or registration or any application for renewal of the license or registration.

(b) ~~A demonstrated~~ The licensee or registrant demonstrated incompetency to act in the business industry or businesses industries for which a Wisconsin license or registration is held or was issued.

(c) ~~Two willful violations of~~ The licensee or registrant willfully violated for a second time or more any provision of ch. 280, Stats., or any rule, regulation or order prescribed by the department.

(d) ~~Conviction~~ The licensee or registrant was found guilty in any civil or criminal proceeding of any action constituting fraud in connection with water well drilling, heat exchange drilling or pump installing activities or operations.

(2) SUSPENSION AND REVOCATION ACTIVITIES. No individual or person, ~~firm, corporation or partnership~~ whose license or registration has been suspended or revoked may engage in the business of water well drilling, heat exchange drilling or pump installing during the suspension or revocation period unless all of the following apply:

(a) ~~Well~~ Water well drilling activities are performed under the direct supervision of a Wisconsin registered licensed individual water well driller, heat exchange drilling activities are performed under the direct supervision of a Wisconsin licensed individual heat exchange driller and pump installing activities are performed under the direct supervision of a Wisconsin registered licensed individual pump installer.

(b) The water well driller whose license or registration was suspended or revoked well driller or pump installer shall be an employee of the Wisconsin registered licensed water well driller or pump installer directly supervising providing direct supervision of his or her activities or shall be an employee of a Wisconsin registered water well drilling business whose licensed supervisory individual water well driller is providing direct supervision to the water well driller whose license or registration was suspended or revoked. The heat exchange driller whose license or registration was suspended or revoked shall be an employee of the Wisconsin licensed heat exchange driller providing direct supervision of his or her activities or shall be an employee of a Wisconsin registered heat exchange drilling business whose licensed supervisory individual heat exchange driller is providing direct supervision to the heat exchange driller whose license or registration was suspended or revoked. The pump installer whose license or registration was suspended or revoked shall be an employee of the Wisconsin licensed pump installer providing direct supervision of his or her activities or shall be an employee of a Wisconsin registered pump installing business whose licensed supervisory individual pump installer is providing direct supervision to the pump installer whose license or registration was suspended or revoked. A copy of the employment contract under pars. (b), (c) or (d) is shall be provided to, and approved by the department before any water well drilling, heat exchange drilling or pump installing is commenced. An employment contract entered into to meet the requirements of this chapter shall include the assignment of responsibility for supervision, submission of reports and the completion of work in conformance compliance with all applicable statutory and administrative code requirements laws and rules and any plans, specifications, variances and approvals approved by the department.

(c) The individual or person whose license or registration was suspended or revoked registrant shall notify the department of the location of any water well drilling, heat exchange drilling or pump installation or filling and sealing the registrant individual or person will be working on at least 48 hours in advance.

(d) The individual or person whose license was suspended or revoked registrant shall notify the department of the location of each water well drilling rig, heat exchange drilling rig or pump installation truck owned, leased or used by the individual or person whose license or registration was suspended or revoked registrant of any change in the location of any rig or truck during the suspension or revocation period.

(3) REINSTATEMENT. (a) ~~A registrant who~~ An individual whose license has been suspended based on incompetency to act in the business or businesses for which a Wisconsin registration license was issued shall demonstrate competency to engage in the business or businesses by passing an exam administered by the department before the suspension is ended by the department.

(b) ~~A registrant~~ An individual whose license has been revoked may apply for a new registration or license one year or thereafter after the date of revocation. A registration license application by a revoked registrant from an individual whose license was revoked is not a renewal. A person whose registration has been revoked may apply for a new registration one year or thereafter after the date of revocation.

SECTION 23. NR 146.09 (3) (c) and (d) are created to read:

NR 146.09 (3) (c) An individual whose water well drilling, heat exchange drilling or pump installing license was revoked for any reason shall demonstrate the licensee's knowledge to engage in the business or businesses by passing an exam administered by the department. An individual who has had a water well drilling, heat exchange drilling or pump installing license revoked for incompetency is not eligible to become licensed again until after the individual has demonstrated competency in the activity for which the individual was deemed incompetent. In the alternative, the department may grant a conditional license to the applicant, which restricts the individual from engaging in the activity for which the individual was deemed incompetent. Competency shall be demonstrated by performing the activity while working under the direct supervision of an individual licensed for that activity for at least 2 years without violations.

(d) An individual whose license was suspended for willful violations and has failed to comply with requirements of the suspension order so that the suspension extends longer than one calendar year, shall take and pass the exam to become licensed, as provided in s. NR 146.07(2).

SECTION 24. NR 812.01 (2) is amended to read:

NR 812.01 (2) This chapter shall govern the location, construction or reconstruction and maintenance of wells and water systems and heat exchange drillholes, the abandonment filling and sealing of wells and drillholes and the installation and maintenance of pumping and treatment equipment.

SECTION 25. NR 812.03 (1), (3) and (4) are amended to read:

NR 812.03 Cooperation with the department. (1) Well drillers, pump installers and well constructors shall, when requested by the department, give notice to the department as specified in the notice of request at least on the department work day prior to the day upon which any well construction or reconstruction or any part thereof, any well abandonment filling and sealing or the

installation of any pumping equipment, will commence or be completed. Heat exchange drillers shall notify the department no less than one work day prior to constructing or reconstructing a heat exchange drillhole.

(3) Well and heat exchange drillers and well constructors shall contact the department to determine if any special construction is required if the well or heat exchange driller or well constructor proposes to construct or reconstruct a well or heat exchange drillhole on a property that is located within the service area of a municipally owned water system.

(4) Well and heat exchange drillers and well constructors shall, when requested by the department, contact the department to determine if any special construction is required if the well or heat exchange driller or well constructor is engaged to construct a new well or heat exchange drillhole or reconstruct an existing well because the existing well or heat exchange drillhole is known to contain contaminants in excess of the drinking water standards in ch. NR 809.

SECTION 26. NR 812.03 (5) is created to read:

NR 812.03 (5) Heat exchange drillers shall contact the local water supply utility in order to determine whether the project is located within a wellhead protection area or within 400 feet of a municipal well.

SECTION 27. NR 812.04(1) is amended to read:

NR 812.04 Contracts for noncomplying installations. (1) Well and heat exchange drillers, pump installers and well constructors shall ensure that the construction and reconstruction of wells, heat exchange drillholes or the installation of pumping equipment adheres to all the applicable provisions of this chapter or to approved comparable construction or installation requirements. Well and heat exchange drillers, pump installers and well constructors may not enter into any agreement, written or oral, for construction, reconstruction or installation which does not require compliance with the applicable provisions of this chapter or with approved comparable construction or installation requirements.

SECTION 28. NR 812.07 (33) (a) is amended to read:

NR 812.07 (33) (a) "Heat exchange drillhole" means a drillhole used for closed-loop heat exchange purposes an excavation or opening in the ground that is deeper than it is wide, that extends more than 25 feet below the ground surface, and that is made for the purpose of installing a geothermal closed-loop heat exchange system.

SECTION 29. NR 812.07 (50e) is created to read:

NR 812.07 (50e) "Heat exchange drilling" means the industry and procedure employed in making heat exchange drillholes.

SECTION 30. NR 812.08 (title) and (4) (intro.) are amended to read:

NR 812.08 ~~Well,~~ Water well, heat exchange drillhole, reservoir and spring location.

(4) RELATION TO CONTAMINATION SOURCES. Minimum separating distances between any new potable or nonpotable well, heat exchange drillhole, reservoir or spring and existing sources of contamination; or between new sources of contamination and existing potable or nonpotable wells, heat exchange drillholes, reservoirs or springs shall be maintained as described in this subsection. The minimum separating distances of this subsection do not apply to dewatering wells approved under s. NR 812.09 (4) (a). Greater separation distances may be required for wells requiring plan approval under s. NR 812.09. Separation distance requirements to possible sources of contamination will not be waived because of property lines. Minimum separating distances are listed in Table A and are as follows:

SECTION 31. NR 812.08(5) is created to read:

NR 812.08(5) HEAT EXCHANGE DRILLHOLE SEPARATION DISTANCES. Minimum separation distances between any heat exchange drillhole, water supply wells, and existing sources of contamination; or between new sources of contamination and existing heat exchange drillholes shall be maintained as described in this subsection. Separation distance requirements to possible sources of contamination will not be waived because of property lines. Minimum separating distances are ten feet between a heat exchange drillhole and each of the following:

- (a) Non-municipal water supply well.
- (b) Onsite waste disposal system.
- (c) Buried fuel storage tank.

SECTION 32. NR 812.09 (4) (intro.), (a)5., and (q) are amended to read:

NR 812.09 (4) APPROVALS REQUIRED. Prior department approval is required for the activities described in this subsection. When deemed necessary and appropriate for the protection of public safety, safe drinking water and the groundwater resource, the department may specify more stringent well and heat exchange drillhole locations location, well and heat exchange drillhole construction or pump installation specifications for existing and proposed high capacity, school or wastewater treatment plant water systems requiring approval by this subsection or water systems approved by variance. Approval by the department does not relieve any person of any liability which may result from injury or damage suffered by any other person. In addition, failure to comply with any condition of an approval or the construction, reconstruction or operation of any well or water system in violation of any statute, rule or department order shall void the approval. Approval is required for:

NR 812.09 (4) (a) 5. High capacity test drillholes or up to 2 geothermal heat exchange drillholes may be constructed without approval to test for aquifer yield to determine if a high capacity well, heat exchange drillhole or well system is feasible. The well casing pipe for such test drillholes shall not exceed 6-inch diameter unless the well driller notifies the department. High capacity test drillholes may be test pumped at a rate of 70 gallons per minute or more if the test does not last more than a total of 72 hours. After testing, the drillhole shall be abandoned filled and sealed according to the requirements of s. NR 812.26 or shall be converted, with approval, to a high capacity well, heat exchange drillhole, or well system which meets the requirements of this chapter or ch. NR 811 and of any approved plans and specifications.

NR 812.09 (4) (q) The installation of a ~~heat exchange~~ or cathodic protection drillhole.

SECTION 33. NR 812.09 (4) (x), (y), and (z) are created to read:

NR 812.09(4)(x) The construction of 10 or more heat exchange drillholes, or where the sum of the depths of all heat exchange drillholes is greater than 4000 feet, for a single drilling site.

NR 812.09(4)(y) Any heat exchange drillhole greater than 400 feet in depth.

NR 812.09(4)(z) Any heat exchange drillhole within 400 feet of a municipal water supply well.

Note: Conditions that warrant variation from the original proposed project design, require consultation with the Department and the heat exchange driller will be required to obtain a variance, as specified in s. NR 812.09(4)(d).

SECTION 34. NR 812.09 (5) is amended to read:

NR 812.09(5) APPROVAL VERIFICATION. A well or heat exchange driller, well constructor, pump installer or contractor shall obtain a copy of the approval for any activity identified in sub. (4) prior to the initiation of any work on a well, heat exchange drillhole, pump installation or water system. When necessary and appropriate the department may grant a verbal approval to a well or heat exchange driller, pump installer or contractor to initiate an activity before obtaining a written copy of the approval provided the conditions of the approval are complied with.

SECTION 35. NR 812, Subchapter II (title) is amended to read:

Subchapter II — New Water Well and Heat Exchange Drillhole Construction and Reconstruction and Filling and Sealing of Wells and Drillholes

SECTION 36. NR 812.10 (title), (1), (2), (3), (4), (5), (6) and (8) are amended to read:

NR 812.10 Well and heat exchange driller and well constructor requirements.

(1) LICENSE. Well and heat exchange drillers shall hold a valid Wisconsin well or heat exchange drilling license. The name of the well driller and the well drilling license number shall be displayed on all well drilling rigs used in the construction of wells. The letters and numbers shall be at least 2 inches in height with at least 1/4 inch wide brush stroke. The identification shall have a sharp color contrast with the back-ground on which it is applied. The identification shall remain legible.

(2) LOCATION. Well and heat exchange drillers and well constructors shall be responsible for proper location of a well or heat exchange drillhole. Wells shall be located in sanitary locations and meet the minimum separation requirements specified in s. NR 812.08. Separation distance requirements to possible sources of contamination will not be waived because of property lines. Wells Water wells may not be constructed within 1,200 feet of a landfill site without a variance. Variances from location minimum separation distance requirements require approval. ~~Well drillers and well constructors shall contact the diggers hotline not less than 3 business days prior to constructing or reconstructing a well on a property. If the property is located within the service area of a municipally owned water system, the well driller or well constructor shall contact the department before constructing or reconstructing a well, to determine if the property on which the well is or will be located is listed on the department's geographic information system registry of closed remediation sites. If the property is located within the area served by a municipally owned water system, the water well driller or well constructor shall notify the well owner of the need to obtain a private well operational permit from the municipality.~~

(3) EQUIPMENT AND MATERIALS. Well and heat exchange drillers and well constructors shall be adequately equipped to comply with the well construction requirements of ss. NR 812.11 to 812.16 and Tables I-IV. All materials installed in a well or heat exchange drillhole shall be new, unused and approved for use, except as specified in s. NR 812.26 (5). The department may prohibit the use of any material or equipment that poses a significant hazard to public health, safe drinking water or groundwater.

(4) CONSTRUCTION METHODS. Well and heat exchange drillers and well constructors shall comply with this chapter in the construction and reconstruction of all wells or heat exchange drillholes. Adequate protection shall be provided for the top of the drillhole and the top of the well casing pipe to prevent surface contamination from entering the well or heat exchange drillhole during the drilling operation and when the driller is not at the drilling site. Well construction methods are depicted in figures 51 to 75.

(5) SPECIAL CASING AREAS. Well drillers and well constructors shall comply with the well casing pipe depth requirements in special well casing pipe depth areas established by the department where aquifers have been contaminated or in other special areas. Heat exchange drillers shall contact the Department to discuss any special construction or installation requirements. A list of the special well casing pipe depth areas and the special casing pipe depth requirements may be obtained from the department.

(6) GROUTING AND SEALING. Well and heat exchange drillers and well constructors shall be responsible for completing all grouting and sealing requirements using the mixtures and methods of s. NR 812.20. Grouting methods are depicted in figures 11 to 18. Heat exchange drillholes shall not remain open and ungrouted for more than 24 hours after completion.

(8) NONCOMPLYING WELLS OR HEAT EXCHANGE DRILLHOLES. When a water well or heat exchange driller or well constructor has constructed a water well or heat exchange drillhole not initially located or constructed in compliance with this chapter, the water well or heat exchange driller or well constructor shall pay all costs for bringing the well or heat exchange drillhole into compliance with this chapter, including abandonment costs the costs of filling and sealing the well or drillhole, if necessary, other than those costs that would have been charged for an initial complying construction.

SECTION 37. NR 812.10 (12) is created to read:

NR 812.10 (12) PRESSURE TESTING OF HEAT EXCHANGE LOOPS. Vertical heat exchange loop piping shall be pressure tested with potable water or an approved fluid in the loop, according to manufacturer's specifications.

SECTION 38. NR 812.11 (title), (1) (intro.), and (2) (intro.) and (g) are amended to read:

NR 812.11 Well and heat exchange drillhole construction equipment & materials.

(1) ADEQUACY OF EQUIPMENT. Well Water well and heat exchange drillers, water well and heat exchange drilling businesses and well constructors shall be adequately equipped to enable ~~him or her~~ the individual, business and those who are supervised to fully comply with all legal requirements applicable to any well or drillhole construction, reconstruction or well or drillhole abandonment filling and sealing which is undertaken by ~~him or her~~ the licensee, registrant or any employees.

(2) MATERIALS. All materials permanently installed in a well shall be new, unused and approved for use except as specified in s. NR 812.26 (5). Lead compounds used to lubricate and seal drill stem joints or any equipment entering a potable water well may not be used. Materials

containing lead having a lead content greater than ~~8%~~ 0.025% by weighted average by weight, may not be installed in a potable water well. ~~Component parts of manufactured products containing lead shall not have a lead content of more than 5% of the total product weight.~~ "Lead wool" or other products containing more than ~~8%~~ 0.025% lead may not be used as seals in the bottom of an open-ended well casing pipes or as screens terminating in coarse formations.

(g) *Drilling aids.* Only approved drilling aids may be used in well and heat exchange drillhole construction and reconstruction. Approval of drilling aids is based on, but not limited to toxicity, groundwater contamination potential and expected effectiveness of the materials. A list of approved drilling aids is available from the department upon request.

SECTION 39. NR 812.12 (title) and (1) are amended to read:

NR 812.12 (title) General drilled type well and heat exchange drillhole construction requirements.

(1) Every well and heat exchange drillhole shall be planned and constructed so that:

(a) ~~Will be~~ It is adapted to the geologic and groundwater conditions of the proposed well or heat exchange drillhole site to ensure full utilization of every natural protection against contamination of the water bearing formation or formations and to exclude possible sources of contamination.

(b) ~~Should~~ Wells will produce bacteriologically safe water.

Note: In some areas of Wisconsin the useable aquifer is contaminated throughout its entire vertical extent. In such areas, it may not be possible to obtain bacteriologically safe water.

(c) ~~Will~~ Wells will provide an adequate and contaminant free water supply, where the natural geologic and groundwater conditions allow.

(d) ~~Will~~ It will conserve groundwater.

(e) ~~Will~~ It will allow reconstruction, when necessary.

SECTION 40. NR 812.12 (10) is created to read:

(10) Drilling fluid must be less dense than the grout to facilitate proper sealing of heat exchange drillholes.

SECTION 41. NR 812.12 (10) thru (21) are renumbered:

SECTION 42. NR 812.12 (16) is amended to read:

NR 812.12 (16) More stringent well construction methods including but not limited to deeper well casing pipe depth settings are required by the department for wells constructed through formations where contaminant levels exceed the drinking water standards in s. NR 812.06, and may be required when there is groundwater contamination exceeding ch. NR 140 enforcement standards on a property that is listed on the department's geographic information system registry of closed remediation sites. When drilling in areas where there are contaminated formations, and on properties where the water well or heat exchange driller or well constructor has been notified that the property is listed on the department's geographic information system

registry of closed remediation sites, consultation with the department is required. If required by the department, special well and drillhole construction methods shall be utilized when constructing or reconstructing wells or drillholes located on properties that are listed on the department's geographic information system registry of closed remediation sites.

SECTION 43. NR 812.17 (title), (1), (2)(b) and (c) (intro.), and (3)(a)4. are amended to read:

NR 812.17 Well casing and heat exchange pipe, liner pipe and materials.

NR 812.17 (1) GENERAL. Well and heat exchange drillhole casing pipe, heat exchange loop pipe, and liner pipe shall be new, unused, and nonreclaimed pipe except as specified in s. NR812.26 (5). The pipe shall meet ASTM or API standards and shall also meet the following requirements:

(a) *Temporary casing.* Temporary casing pipe for all wells and heat exchange drillholes, or well casing pipe greater than 12-inch diameter used for nonpotable wells may be a lighter weight steel pipe than specified for a given diameter in Table V. Pipe for nonpotable wells greater than 12-inch diameter shall have a minimum wall thickness of at least 0.250 inches and be able to withstand the structural stress imposed by construction conditions. Thermoplastic pipe meeting the minimum requirements of sub. (3) may be used for temporary casing for heat exchange drillholes in caving formations.

(b) *Pipe for liners.* Liner pipe installed solely to seal off a caving or sloughing zone in a well or heat exchange drillhole shall be new, unused and nonreclaimed steel or thermoplastic pipe. Steel pipe shall also meet the specifications of Table V except that it may have a lesser wall thickness than what is required in Table V for the diameter of pipe used. Steel pipe for such liners shall have a minimum wall thickness of 0.216 inches. The pipe may have the largest practical diameter allowing installation in the well. When thermoplastic pipe is used for such liners, it shall meet the minimum requirements of sub. (3). Liner pipe used in all other situations shall meet the specifications in Table V for steel pipe or the requirements of sub. (3), and the cement grout annular space seal thickness for thermoplastic pipe may not exceed 1-½ inches. For the requirements for the installation of liner pipe see s. NR 812.21.

NR 812.17 (2) (b) *Well Water well driller, heat exchange driller, well constructor responsibilities.* Well and heat exchange drillers and well constructors may not use unmarked or inadequately marked well or heat exchange drillhole casing pipe for permanent well or heat exchange drillhole casing pipe. It is the well and heat exchange driller's or well constructor's responsibility to use well casing pipe that meets the requirements of this chapter. The well and heat exchange driller or well constructor shall examine all shipments of well or heat exchange drillhole casing pipe received and shall reject any defective length of pipe and return it to the manufacturer or supplier. When the well and heat exchange drillhole casing pipe or the pipe markings are of questionable condition, the well and heat exchange driller or well constructor shall supply the department with the manufacturer's mill certification papers listing the pipe specifications including the heat numbers.

(c) *Defective pipe.* Well and heat exchange drillhole casing or heat exchange loop pipe may be inspected by the department. Any defective length may be rejected by the department and may not be used in well construction. Reject pipe may include:

NR 812.17 (3) (a) 4. The well and heat exchange drillhole casing pipe shall be marked in accordance with the ASTM F 480 specification and this section. The pipe shall be marked at least every 5 feet showing the nominal size; standard dimension ratio or schedule number; type of material; the wording—"well casing"—followed by impact classification; designation "ASTM F 480" including year of issue of the standard with which the well casing pipe complies; manufacturer's

name or trademark; manufacturer's code for resin manufacture, lot number and date of manufacture; and the NSF-WC designation or other approved laboratory's seal or mark.

SECTION 44. NR 812.18 (3) is created to read:

NR 812.18 (3) Fusion welding connection for vertical heat exchange piping shall be done using socket fusion, saddle fusion or butt fusion type, in accordance with pipe manufacturer's instructions or as referenced in ASTM D 2610, D 2683 and D2657. Joint surfaces shall be clean and moisture free.

SECTION 45. NR 812.20 (1) (a) 7. is created to read:

NR 812.20 (1) (a) 7. Of heat exchange drillholes if potable water or an approved fluid is continuously circulated in the loop pipe until heat of hydration subsides to a safe level below the temperature of potential loop pipe deformation.

SECTION 46. NR 812.20 (1) (c) is amended to read:

NR 812.20(1) (c) Sodium bentonite water slurry (drilling mud and cuttings). A sodium bentonite water slurry (drilling mud and cuttings) may be used as sealing material in unconsolidated formation wells or bedrock wells, provided depth to a bedrock formation or other well construction requirements in Tables I to IV do not specify the use of neat cement grout and the well is not a potable high capacity, school or wastewater treatment plant well. A mud weight of at least 11 pounds per gallon is required. Normal drilling mud circulated during the construction of wells may not meet this requirement for sealing unless additional drill cuttings are added to the slurry. Sodium bentonite water slurry (drilling mud and cuttings) is not allowed for grouting of heat exchange drillholes.

SECTION 47. NR 812.20 (1) (d) is amended to read:

NR 812.20 (1) (d) *Clay slurry.* Clay slurry is a fluid mixture of water, clean native or approved commercial clay; and drill cuttings. Clay slurry may be used as an annular space sealing material for low capacity wells constructed with percussion methods, except for bedrock wells where the upper enlarged drillhole extends more than 5 feet into the bedrock or when the bedrock is encountered at a depth of less than 40 feet, 30 feet for sandstones and except for school and wastewater treatment plant wells. The clay slurry shall have a mud weight of at least 11 pounds per gallon. Clay slurry is not allowed for grouting of heat exchange drillholes.

SECTION 48. NR 812.20(1) (e), (f), (g) and (h) and (i) are created to read:

NR 812.20(1) (e) *Sodium bentonite.* A sodium bentonite grout may be used as a sealing material for heat exchange drillholes, if a minimum of a 20 percent solids mixture is maintained as per manufacturer specifications.

(f) *Sodium bentonite (bentonite-sand) grout.* Sodium bentonite grout may be mixed with clean silica sand up to a ratio of a 5 to 1 mixture of silica sand to bentonite grout, for grouting heat exchange drillholes. Higher mix ratios must receive prior approval from the department before being used. Clean silica sand shall consist of silica sand with 80 percent or more of the sand smaller than 0.0117 inch (passing U.S. Sieve #50) in size.

(g) *Cement (cement-bentonite) grout.* A cement (cement-bentonite) premix product may be used as a sealing material for heat exchange drillholes if it is approved by the department before being used. Drillers shall not mix their own ratio.

(h) *Carbon (carbon-bentonite) grout.* A carbon-bentonite premix product may be used as a sealing material for heat exchange drillholes if it is approved by the department before being used. Drillers shall not mix their own ratio.

SECTION 49. NR 812.20 (2) (c) and (j) and (3) (a) and (b) are amended to read:

NR 812.20 (2) (c) The grout shall be placed in one continuous operation, if possible. It is the well or heat exchange driller's or well constructor's responsibility to ensure that all necessary materials are on the job site. If unforeseen circumstances prevent completing the cement grouting work in one continuous operation, the well or heat exchange driller or well constructor shall report the non-continuous grouting operation and the reason for it on the construction report for the well.

NR 812.20 (2) (j) The "conductor (tremie) pipe-gravity" method is not an approved pressure method of grouting. All other methods described in sub. (3) are approved pressure methods for cement grouting and sealing and shall be used when neat cement grout is required to seal the annular space when the upper enlarged drill-hole is less than 4 inches larger in diameter than the nominal diameter of the well casing pipe or when the upper enlarged or heat exchange drillhole extends greater than 25 feet deep or when the heat exchange drillhole is less than 25 feet deep.

NR 812.20 (3) (a) *Conductor (tremie) pipe-gravity.* As depicted in figure 11, grout material may flow by gravity through a funnel or hopper connected to a conductor pipe. The conductor (tremie) pipe shall be lowered to the bottom of the annular space to be grouted and the grout material placed from the bottom up. The end of the conductor pipe shall be kept submerged in the grout at all times. This method may be used only when the upper enlarged drillhole is at least 4 inches larger in diameter than the nominal diameter of the well casing pipe and is less than 100 feet deep or when the heat exchange drillhole is less than 25 feet deep. The grout shall flow at the surface with the same consistency as the grout entering the well.

(b) *Conductor (tremie) pipe-pumped.* As depicted in figure 12, the grout material shall be placed by a pump through a conductor pipe into the annular space between the well casing pipe and the upper enlarged drillhole wall or inside surface of the temporary outer casing or a heat exchange drillhole. The minimum diameter of the upper enlarged drillhole shall be as specified in Tables I to IV. The conductor pipe shall be lowered to the bottom of the annular space to be grouted and the grout material shall be pumped from the bottom up. The end of the conductor pipe shall be kept submerged in the grout at all times and the conductor pipe shall be maintained full of grout. The grout shall flow at the surface with the same consistency as the grout entering the well.

SECTION 50. NR 812.22 (7) (title), (a)(intro.) and (b) are amended to read:

NR 812.22 (7) WELL AND DRILLHOLE CONSTRUCTION REPORTS (a) The water well or heat exchange driller who contracted to construct the water well or heat exchange drillhole, the water well or heat exchange driller who actually constructed the water well or heat exchange drillhole, or the water well or heat exchange drillhole constructor shall submit an original well construction report to the department and to the owner within 30 days following the day the water well or heat exchange drillhole was completed or reconstructed. Heat exchange drillholes require one well construction report for every 20 drillholes drilled, and the well construction report shall include the latitude and longitude of the corresponding drillhole location. Latitude and longitude for each drillhole at a project site shall be reported for heat exchange projects requiring approval under s. NR 812.09(4). Heat

exchange drillhole construction reports shall be spaced across the project site as practicable as possible, or should be reflective of geologic variation that may occur across the site. A well construction report shall be submitted for any well deepening. A water well or heat exchange drillhole is completed when all operations that require the use of drilling, driving or annular space sealing equipment have been completed. A well construction report is not required for well screen replacement if the screen is set to a depth not exceeding 5 feet above or below the original screen depth setting. A well construction report is also not required for blasting or hydrofracturing when done within 30 days after original completion of the well construction. Such work shall be reported on the original well construction report or on a copy of the original report. An accurate and complete well construction report shall be submitted on a form prescribed by the department to:

(b) Well or heat exchange drillhole construction reports returned to the water well driller, heat exchange driller or well constructor for completion or when compliance with the construction requirements of this chapter is questionable shall be resubmitted to the department within 15 days of receipt. The original well or heat exchange drillhole construction report shall be resubmitted. Dry drillholes or unsuccessful wells drilled in conjunction with well construction and not immediately abandoned filled and sealed shall be reported on a well construction report and on a well-abandonment report form. The water well driller, heat exchange driller, or well constructor shall ensure that proper abandonment filling and sealing methods and materials are used according to s. NR 812.26, ~~of for~~ any drillhole constructed by the water well driller or well constructor that is not intended to provide water.

SECTION 51. NR 812.22 (9) is created to read:

NR 812.22 (9) HEAT EXCHANGE FLUIDS. Only department approved heat exchange fluids may be used in the piping placed in heat exchange drillholes.

SECTION 52. NR 812.26 (2) (a) 5. is created to read:

NR 812.26 (2) (a) 5. The heat exchange drillhole will not be used as part of the heat exchange system.

SECTION 53. NR 812.26(2) (b) 2. is amended to read:

NR 812.26 (2) (b) 2. The well or heat exchange drillhole was not constructed by the well owner or by a licensed well or heat exchange driller, or

SECTION 54. NR 812.26 (2) (c) 1. is amended to read:

NR 812.26 (2) (c) 1. The well or heat exchange drillhole construction or location does not comply with the minimum standards of this chapter at the time the well or heat exchange drillhole was constructed, or

SECTION 55. NR 812.26 (7) (a) 7. is created to read:

NR 812.26 (7) (a) 7. 'Filling heat exchange drillholes'. a. If the loops for a heat exchange drillhole have not been grouted in place and can be removed from the drillhole, then the loops shall be removed and the drillhole shall be filled with grout.

b. If the loops for a heat exchange drillhole have been grouted in place and cannot be removed from the drillhole, then the loops shall be evacuated of all fluids and grout shall be pumped into the loops. The drillhole shall be grouted. The loops may be left in place after the grouting procedure or may be cut off below ground surface.

SECTION 56. NR 812.26 (8) is amended to read:

NR 812.26 (8) ABANDONMENT WELL AND DRILLHOLE FILLING AND SEALING REPORTS. An abandonment A well and drillhole filling and sealing report shall be filed with the department within 30 days after the well or drillhole is abandoned filled and sealed. The abandonment filling and sealing report shall be filed by the person performing the abandonment filling and sealing work on forms provided specified by the department and shall include a complete, true and accurate detailed description of the location of the well or drillhole that was filled and sealed, materials and method of filling and sealing, construction and geologic features and Wisconsin Unique Well Number, if known. ~~Well~~ Water well drillers, heat exchange drillers, well constructors and pump installers shall report to the department any unused or unabandoned wells or drillholes that are not filled and sealed of for which they have knowledge to the department. Beginning July 1, 2016 filling and sealing reports shall be filed with the department electronically.

SECTION 57. NR 812.43 (1) (intro.) is amended to read:

NR 812.43 Variances. (1) When strict compliance with the requirements of this chapter is not feasible, a variance may be requested. All variance requests shall be in writing, except for situations that may require an immediate response, in which case a variance may be requested verbally from the owner, or the owner's agent, and a verbal variance may be granted by the department to be followed up with a written confirmation. If the verbal request is made by the owner's agent, the agent shall provide confirmation of the owner's concurrence with the request. A variance request shall include the names of the owner or owners and, if known, the well or heat exchange driller, well constructor or pump installer. The reason or reasons compliance with the requirements for this chapter is not feasible shall also be provided. The department may require the owner or the owner's agent to submit additional information necessary for the department to determine if a variance is justified. The owner or owners or the owner's agent shall sign the variance request. The department may condition the issuance of a variance by requiring additional construction or installation features to safeguard the groundwater and water supplied by the installation from contamination. Failure to comply with the conditions of a variance or the applicable requirements of this chapter voids the variance approval.

Section 56. EFFECTIVE DATE. This rule shall take effect on the first day of the month following publication in the Wisconsin administrative register as provided in s. 227.22 (2) (intro.), Stats.

Section 57. BOARD ADOPTION. This rule was approved and adopted by the State of Wisconsin Natural Resources Board on _____.

Dated at Madison, Wisconsin _____.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL
RESOURCES

By _____

Cathy Stepp, Secretary

(SEAL)