LCRC
FORM 2

WISCONSIN LEGISLATIVE COUNCIL
RULES CLEARINGHOUSE

Ronald Sklansky
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Clearinghouse Assistant Director

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CLEARINGHOUSE REPORT TO AGENCY

[THIS REPORT HAS BEEN PREPARED PURSUANT TO S. 227.15, STATS. THIS IS A REPORT ON A RULE AS ORIGINALLY PROPOSED BY THE AGENCY; THE REPORT MAY NOT REFLECT THE FINAL CONTENT OF THE RULE IN FINAL DRAFT FORM AS IT WILL BE SUBMITTED TO THE LEGISLATURE. THIS REPORT CONSTITUTES A REVIEW OF, BUT NOT APPROVAL OR DISAPPROVAL OF, THE SUBSTANTIVE CONTENT AND TECHNICAL ACCURACY OF THE RULE.]

CLEARINGHOUSE RULE **02–013**

AN ORDER to renumber NR 811.02 (4) to (28); and to create NR 811.02 (4), (5), (13), (15), (28) and (29) and subchapter IX of chapter NR 811, relating to the development of an aquifer storage recovery well or the operation of an ASR system by a municipal water utility.

Submitted by **DEPARTMENT OF NATURAL RESOURCES**

02–05–02 RECEIVED BY LEGISLATIVE COUNCIL.

03–04–02 REPORT SENT TO AGENCY.

RS:MCP:tlu;ksm

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LEGISLATIVE COUNCIL RULES CLEARINGHOUSE REPORT

This rule has been reviewed by the Rules Clearinghouse. Based on that review, comments are reported as noted below:

1. STATUTORY AUTHORITY [s. 227.15 (2) (a)]

   Comment Attached YES ☑ NO ☐

2. FORM, STYLE AND PLACEMENT IN ADMINISTRATIVE CODE [s. 227.15 (2) (c)]

   Comment Attached YES ☑ NO ☐

3. CONFLICT WITH OR DUPLICATION OF EXISTING RULES [s. 227.15 (2) (d)]

   Comment Attached YES ☐ NO ☑

4. ADEQUACY OF REFERENCES TO RELATED STATUTES, RULES AND FORMS [s. 227.15 (2) (e)]

   Comment Attached YES ☐ NO ☑

5. CLARITY, GRAMMAR, PUNCTUATION AND USE OF PLAIN LANGUAGE [s. 227.15 (2) (f)]

   Comment Attached YES ☑ NO ☐

6. POTENTIAL CONFLICTS WITH, AND COMPARABILITY TO, RELATED FEDERAL REGULATIONS [s. 227.15 (2) (g)]

   Comment Attached YES ☐ NO ☑

7. COMPLIANCE WITH PERMIT ACTION DEADLINE REQUIREMENTS [s. 227.15 (2) (h)]

   Comment Attached YES ☐ NO ☑

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CLEARINGHOUSE RULE 02–013

Comments

[NOTE: All citations to "Manual" in the comments below are to the Administrative Rules Procedures Manual, prepared by the Revisor of Statutes Bureau and the Legislative Council Staff, dated September 1998.]

1. Statutory Authority

a. The proposed rule incorporates a statement after s. NR 811.88 (1) that responds to the requirement of s. 160.19 (2) (b), Stats. However, the department should review the rule and note to determine if it is sufficient to meet the requirement of s. 160.19 (2) (a) and (b), Stats. The statute allows promulgation of a rule that does not maintain compliance with preventive action limits if compliance with the preventive action limits is not technically and economically feasible (see s. 160.19 (2) (a), Stats.), but requires the rule to contain a statement to that effect. Section 160.19 (2), Stats., does not allow a rule to be promulgated if it will not maintain compliance with enforcement standards. Rather, if an enforcement standard is exceeded, the only option is a response under s. 160.25, Stats. The note is unclear, because it refers to "groundwater standards" rather than preventive action limits or enforcement standards.

b. The department should also consider the language in the note to s. NR 811.88 (8) that refers to the exeedance of groundwater standards "at the point of injection and within the displacement zone," and how this phrase relates to the concept of the point of standards application that is established in ch. 160, Stats., and ch. NR 140, Wis. Adm. Code.

2. Form, Style and Placement in Administrative Code

a. The phrase following "displacement zone" in s. NR 811.88 (3) duplicates language that is included in the definition of "displacement zone," and should therefore be deleted.

b. The notes to ss. NR 811.88 (3) and 811.89 (2) and (3) should be incorporated into the text of the rule. The term "paragraph" found in the notes should be amended to "subsection" or "section," as appropriate.

c. In s. NR 811.91 (4) (intro.), the phrase "all of" should be inserted after the word "contain."

d. In s. NR 811.92 (3) (c), the cross-reference should read "chs. NR 140 and 809." In sub. (4) (b), the phrase "the well or wells" should be replaced by the phrase "any well."

5. Clarity, Grammar, Punctuation and Use of Plain Language

a. The subject of this rule has been referred to elsewhere as "aquifer storage and recovery." The rule refers to "aquifer storage recovery." The definition in s. NR 11.02 (4) suggests that the former phrase is more descriptive, because the definition separately identifies the functions of storing and later recovering the water.

b. The definition of "ASR system" in s. NR 811.02 (5) seems to indicate that the entire municipal water system becomes an ASR system when an ASR well is connected to the municipal water system. Is this correct?

c. The definition of "displacement zone" in s. NR 811.02 (13) suggests that the subsurface region is defined as the displacement zone prior to the storage of water. Is this correct, or is the displacement zone any subsurface region that is actually occupied by water that has been placed for storage? On the other hand, s. NR 811.88 (4) suggests that the displacement zone remains after stored water is removed.

d. Section NR 811.02 (15) (c) would be more clear if rewritten to read: "Any excavation, shaft or other opening, similar to a hole described in par. (a) or (b)."

e. "Finished" is used in s. NR 811.02 (28). This word is not defined in any of the drinking water rules or statutes. As used in ch. NR 809, it appears to mean "treated." If this meaning is correct, the use of "finished" in the definition is redundant.

f. The use of "well" in the definition of "underground injection" in s. NR 811.02 (29) appears to be unnecessary, because a well is included within the definition of "drillhole." Also, in that definition, the phrase "water system" is vague.

g. Is the reference to "ASR system" in s. NR 811.87 (3) necessary? Is there any way to place treated drinking water underground other than through an aquifer storage well?

h. Section NR 811.90 requires all piping installed in an ASR system to comply with ss. NR 811.34 to 811.38. The definition of "ASR system," as noted earlier, may refer to the entire municipal water system. Do the requirements of ss. NR 811.34 to 811.38 create requirements that apply to the entire municipal water system?

i. The time limit in s. NR 811.91 (6) and 811.92 (6) is unclear, because "of" does not clearly indicate whether the 180 days is before or after completion of the study or development test. Also, should s. NR 811.91 (6) indicate the required contents of the report?

j. Section NR 811.92 does not appear to contain a provision in which the department may deny approval to continue with ASR system development testing based on the results of the ASR system pilot study.

ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD
RENUMBERING AND CREATING RULES

The Wisconsin Natural Resources Board proposes an order to renumber NR 811.02(4) to (28); and to create NR 811.02(4), (5), (13), (15), (28) and (29) and subch. IX to ch. NR 811 relating to the development of an aquifer storage recovery well or the operation of an ASR system by a municipal water utility.

DG-33-01

Analysis Prepared by the Department of Natural Resources

Statutory Authority: ss. 160.19, 280.11(1), 281.11, 281.12(1), 281.13(3), 281.17(8) and 281.41, Stats.
Statutes Interpreted: ss. 160.19(2) and (3), 280.11(1), 281.17(8) and 281.41, Stats.

This action establishes Department of Natural Resources (DNR) policy regarding the development of aquifer storage recovery (ASR) wells and the operation of ASR systems by municipal water utilities.

The rules that are being proposed define terms and create regulatory requirements which are necessary to comply with existing federal regulations pertaining to the quality of drinking water provided by a public water system and the control of underground injection wells. The rules are also being proposed in order to comply with state regulations pertaining to the protection of Wisconsin's groundwater resources.

This action describes the submittal requirements for Department review of a request by a municipal water utility to develop an aquifer storage recovery well or operate an ASR system and identifies the minimum operational standards for ensuring that human health is maintained and that the groundwater resources of the state are adequately protected from contamination.

SECTION 1. NR 811.02(4) to (28) are renumbered NR 811.02(6) to (12), (14), (16) to (27) and (30) to (34), respectively.

SECTION 2. NR 811.02(4), (5), (13), (15), (28) and (29) are created to read:

NR 811.02(4) "Aquifer storage recovery" or "ASR" means placement of treated drinking water underground through a well for the purpose of storing and later recovering the water through the same well for potable use.

Note: Underground placement of water for the purpose of restoring an aquifer is not included in the definition of "aquifer storage recovery" or "ASR."

(5) "ASR system" means all of the ASR wells and related appurtenances within a municipal water system and any interconnected public water system served by the municipal water system.

(13) "Displacement zone" means the subsurface 3-dimensional region surrounding an aquifer storage recovery well into which treated drinking water is placed for storage and later recovery.

(15) "Drillhole" means any of the following:

(a) Any hole that is bored, drilled or driven.

(b) Any dug hole that is deeper than it is wide.

(c) Any similar excavation, shaft or other opening.

(28) "Treated drinking water" means finished potable water which complies with the primary drinking water standards contained in ch. NR 809 and that is obtained directly from a municipal water system via piping from the municipal water distribution system to the point of underground injection.

(29) "Underground injection" means placement of any substance underground through a well, drillhole or water system.

SECTION 3. Chapter NR 811 Subchapter IX is created to read:

Subchapter IX – Aquifer Storage Recovery

NR 811.87 General. (1) Approval of the department is required prior to the construction of any aquifer storage recovery well or the conversion of any previously constructed well for use as an aquifer storage recovery well.

Note: Approval to construct or develop an aquifer storage recovery well is not an approval to operate an ASR system.

(2) Approval of the department is required prior to the operation of any aquifer storage recovery system.

Note: The department will not issue an approval to operate an ASR system until after it has reviewed and evaluated the results of an approved ASR pilot study.

(3) Only treated drinking water may be placed underground through an aquifer storage well or ASR system.

(4) Only a municipal water system may construct an aquifer storage recovery well or operate an ASR system.

NR 811.88 ASR well performance requirements. (1) Where practical, the quality of the treated drinking water to be placed underground through an aquifer storage recovery well shall comply with the enforcement standards contained in ch. NR 140 prior to underground injection. In all cases, the quality of the treated drinking water to be placed underground through an aquifer storage recovery well shall meet the primary drinking water standards contained in ch. NR 809 prior to underground injection.

Note: Pursuant to s. 160.19(2)(b), Stats., the department finds that treated drinking water in a municipal water system may at times exceed groundwater standards established for compounds such as iron, copper, lead, fluoride, asbestos, chloroform, bromoform, bromodichloromethane, and dibromochloromethane and may temporarily cause an exceedance of state groundwater standards at the point of injection and within the displacement zone surrounding an aquifer storage recovery well even though the treated drinking water remains in compliance with federal and state water quality standards for drinking water. Several of the compounds listed here are by-products of water treatment processes that are necessary to ensure that the water distributed within a municipal water system is protected from potential biological contamination. The maximum concentrations of disinfection by-products allowed in treated drinking water have been set by the United States environmental protection agency at the lowest level that is considered to be technically and economically feasible at this time. Research funded by the American Water Works Association Research Foundation indicates that the concentrations of these contaminants will diminish and that compliance with state groundwater standards will be reestablished over time as a result of geochemical and microbial activity occurring underground within the storage aquifer.

(2) All water that is retrieved through an aquifer storage recovery well shall comply with the primary drinking water standards contained in ch. NR 809 and shall be treated to provide a disinfectant residual prior to recovery into any municipal water distribution system.

(3) The quality of the treated drinking water stored in the displacement zone that is created underground as a result of underground injection through an aquifer storage recovery well shall at all times comply with the primary drinking water standards contained in ch. NR 809. The stored treated drinking water shall also comply with the applicable enforcement standards established in ch. NR 140 prior to movement beyond the boundary of the ASR well site.

Note: For the purpose of this paragraph, an ASR well site is considered to include lands adjacent to the ASR wellhead that are directly owned by the municipal water system and any contiguous properties that are directly owned by the local unit of government of which the water system is a subunit.

(4) At the completion of each aquifer storage recovery cycle, the subsurface water remaining in any portion of the displacement zone shall comply with the enforcement standards contained in ch. NR 140.

NR 811.89 Well construction requirements for ASR wells. (1) Each well constructed or converted for use as an aquifer storage recovery well shall be completed in a manner that complies with the well construction requirements established in ss. NR 811.16 to 811.24.

(2) Any monitoring well constructed on an ASR well site shall comply with the well construction requirements established in ss. NR 811.16 to 811.24.

Note: For the purpose of this paragraph, an ASR well site is considered to include only those lands adjacent to the ASR wellhead that are directly owned by the municipal water system.

(3) Each monitoring well that is located beyond the property boundary of an ASR well site and that is constructed as part of an ASR system pilot study, ASR system development study, or for ASR operational monitoring shall comply with the monitoring well construction requirements established in ch. NR 141.

Note: For the purpose of this paragraph, an ASR well site is considered to include only those lands adjacent to the ASR wellhead that are directly owned by the municipal water system.

(4) Each aquifer storage recovery well shall be enclosed within a lockable protective structure that is secured from tampering or unauthorized entry in a manner that is approved by the department.

(5) Each monitoring well shall be enclosed within a lockable protective covering and secured from tampering or unauthorized entry in a manner that is approved by the department.

NR 811.90 Equipment, appurtenances and piping for ASR wells and ASR systems. (1) Pumping equipment, appurtenances and piping that are to be installed as part of an ASR system shall comply with the requirements of ss. NR 811.34 to 811.38.

(2) Department approval shall be obtained prior to installation or modification of any well, pumping equipment, appurtenances or piping for the purpose of aquifer storage recovery.

(3) Security shall be provided for each ASR well site in a manner that is approved by the department.

NR 811.91 ASR system pilot studies. (1) Department approval is required prior to conducting any ASR system pilot study.

(2) Only a municipal water system may perform an ASR system pilot study.

(3) A request to conduct an ASR system pilot study shall be submitted to the department in writing. The request shall identify the location of each existing well that is being considered for use as an ASR well within the proposed ASR system, the location of any new well that is anticipated to be constructed for use as an ASR well within the proposed ASR system and any additional wells that are to be used or constructed as part of the ASR system pilot study.

(4) Each request to conduct an ASR system pilot study shall contain the following:

(a) A preliminary hydrogeologic report that describes the methods and results of any hydrologic investigation, aquifer testing or hydrogeologic modeling performed to identify the location of the proposed ASR system well sites. The preliminary hydrogeologic report shall identify the location of each existing public or private water well and each potential source of groundwater contamination that is located within 1200 feet of the outer perimeter of the displacement zone that is calculated to be established around each of the proposed

ASR wells within the proposed ASR system. The report shall also identify the well selected for further evaluation during the ASR well pilot test, identify the dimensions of the zone of displacement that will be created around the designated test well, and describe the current and anticipated groundwater flow patterns found in the vicinity of the designated test well.

(b) A preliminary engineering report that provides an analysis of the technical feasibility for developing each of the potential ASR wells identified for the proposed ASR system and estimates the probable percentage of treated drinking water that would be recovered from each of the potential ASR wells during an ASR cycle.

(c) Plans and specifications for any well equipment, pumping equipment, appurtenances or piping that is to be constructed or altered in order to complete the proposed ASR system pilot study.

(d) A description of all operating procedures to be followed during the ASR well pilot study. This description shall contain details such as, but not limited to, the maximum volume of water to be placed underground, the flow rate and pressure of underground injection, the expected water storage period, anticipated water retrieval rates, and methods proposed for disposing of the water recovered during the ASR system pilot study.

(e) A description of all performance and compliance monitoring procedures to be followed during the ASR system pilot study. This description shall include a listing of the sampling locations, methods and schedules that will be used to ensure that the aquifer storage recovery well remains in compliance with the performance requirements set forth in s. NR 811.88.

(f) Plans and specifications for each monitoring well proposed as part of the ASR system pilot study. A minimum of one monitoring well is required as part of the ASR system pilot study. The department may require additional monitoring wells should the proposed ASR system encompass multiple or otherwise unique geologic formations. The department may also waive the monitoring well requirement if water quality data from other ASR system pilot studies conducted in similar geologic conditions is submitted as part of the ASR system pilot study request and is determined to be applicable by the department.

(5) The department may require modification of plans and specifications, operating procedures or compliance and monitoring procedures required in sub. (4) to ensure that compliance with the performance requirements in s. NR 811.88 can be determined.

(6) Within 180 days of completing an approved ASR system pilot study and prior to recovering any water retrieved through an ASR well into a water distribution system, a municipal water system shall submit a final report on the ASR system pilot study to the department.

NR 811.92 ASR system development testing. (1) Department approval shall be obtained prior to any ASR system development testing.

(2) Following the completion of an approved ASR system pilot study, each additional ASR well that is to be developed within an ASR system shall be subject to ASR system development testing.

(3) The department may require monitoring wells to be installed as part of an ASR system development test if it finds any of the following:

(a) Geologic conditions in the vicinity of the proposed ASR well are not consistent with the conditions examined during the municipal water system's ASR system pilot study.

(b) Geologic conditions in the vicinity of the proposed ASR well are not consistent with the conditions reported in other ASR system pilot studies or ASR system development tests performed by other municipal water systems.

(c) Results obtained during the municipal water system's ASR system pilot study or other aquifer tests indicate that additional monitoring is warranted to ensure compliance with the water quality standards established in chs. NR 809 and 140.

(4) Each request for an ASR system development test shall include a report or testing plan that contains the following:

(a) A comparison of the hydrogeologic conditions and formations found at the ASR system pilot study well site and any well site that is to be evaluated as part of the ASR system development testing request.

(b) An evaluation of the municipal water system's ASR system pilot test results and the transferability of those results to the well or wells to be evaluated as part of the ASR system development test.

(c) Plans and specifications for any well equipment, pumping equipment, appurtenances or piping that is to be constructed or altered as part of the ASR system development test.

(d) A description of all operating procedures to be followed during the ASR system development test. This description shall contain details such as, but not limited to, the volume of water to be placed underground, the flow rate and pressure of underground injection, backflushing schedules, the expected water storage period, anticipated water retrieval rates and methods for disposing of water recovered during the ASR system development test.

(e) A description of all performance and compliance monitoring procedures to be followed during the ASR system development test.

(f) A description of any monitoring wells proposed to be constructed or utilized during the ASR system development test.

(5) The department may require modification of plans and specifications, operating procedures or compliance and monitoring procedures required under sub. (4) to ensure that compliance with the performance requirements in s. NR 811.88 can be determined.

(6) Within 180 days of completing an approved ASR system development test and prior to recovering any water retrieved through any newly developed aquifer storage recovery well into a water distribution system, the municipal water system conducting the test shall submit a final report containing the final results of the investigation to the department.

NR 811.93 Operating an ASR system. (1) Department approval to operate an ASR system shall be obtained prior to recovery of any water retrieved through an aquifer storage recovery well into a municipal water system.

(2) Only a municipal water system may submit a request to operate an ASR system.

(3) Completion of an ASR pilot study is required before a municipal water system may submit a request to operate an ASR system.

(4) Completion of an ASR system development test and approval of the department is required before any additional aquifer storage recovery well that was not approved as part of an original request to operate an ASR system is connected to the existing ASR system.

(5) A request to operate an ASR system shall be submitted to the department in writing and shall contain the following:

(a) A copy of the final report of the approved ASR system pilot study and copies of any approved ASR system development studies conducted by the municipal water system.

(b) A final plans and specifications report that describes the components of the ASR system. The final plans and specifications report shall include as built drawings for each aquifer storage recovery well and each monitoring well that was constructed as part of the ASR system pilot study or ASR system development study. The report shall also include descriptions of pumping equipment, piping and other appurtenances that are installed or required for ASR system operation.

(c) A proposed final operating plan that describes the entire ASR cycle and shows how the ASR system will be integrated into municipal water system operations. The proposed final operating plan shall include details such as, but not limited to, the total volume of water to be injected, rate of injection, pressure of injection, length of the water storage period, rate of recovery, post-recovery water treatment techniques necessary to maintain a distribution system disinfectant residual, and methods for disposing of any water that cannot be recovered into the water distribution system.

(d) A proposed demand management and water accountability plan that describes actions which the municipal water system is currently conducting or will be initiating to ensure that groundwater and surface water resources are conserved and used as efficiently as possible.

(e) A proposed compliance and monitoring plan that lists all sampling parameters and provides details on monitoring schedules, monitoring locations, sampling methods and quality assurance techniques that will be followed to ensure that compliance with the requirements set forth in s. NR 811.88 is maintained. The compliance and monitoring plan shall provide for testing of the water that is to be injected, stored and recovered through each aquifer storage recovery well and for the groundwater present in any monitoring well that is installed as part of the ASR system. Parameters to be analyzed for each water quality sample collected, the locations for sample collection and the frequency at which water quality samples are to be collected shall be determined by the department following a review of the final ASR system pilot study report or ASR system development study report, the proposed operating plan, the proposed monitoring plan and the drinking water quality monitoring schedule currently followed by the municipal water system. Unless otherwise specified by the department, all water quality results obtained from ASR system compliance monitoring activities shall be compiled and submitted to the department on an annual basis and at least 45 days prior to the start of each new ASR cycle.

(6) The department may require modification of any plans and specifications, operating plans, demand management and water accountability plans or compliance and monitoring plans required in sub. (5) in any manner necessary to ensure compliance with the performance standards set forth in s. NR 811.88.

(7) If requested, the department may consider and approve the modification of plans and specifications, operating plans, demand management and water accountability plans or compliance and monitoring plans required in sub. (5) if information submitted in support of a requested modification demonstrates to the satisfaction of the department that the proposed modifications will continue to ensure compliance with the standards set forth in s. NR 811.88 and any other applicable requirements contained in ch. NR 811.

The foregoing rule was approved and adopted by the State of Wisconsin Natural Resources Board on _____.

The 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.

Dated at Madison, Wisconsin DNR _____.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

By _____
Darrell Bazzell, Secretary

(SEAL)

State of Wisconsin
Department of Natural Resources

NOTICE TO PRESIDING OFFICERS

OF PROPOSED RULEMAKING

Pursuant to s. 227.19, Stats., notice is hereby given that final draft rules are being submitted to the presiding officer of each house of the legislature. The rules being submitted are:

Natural Resources Board Order No. DG-33-01

Legislative Council Rules Clearinghouse Number 02-013

Subject of Rules Development of an aquifer storage recovery well or the operation of an ASR system by a municipal water utility

Date of Transmittal to Presiding Officers August 28, 2002

Send a copy of any correspondence or notices pertaining to this rule to:

Carol Turner, Rules Coordinator
DNR Bureau of Legal Services
LS/5, 101 South Webster

Telephone: 266-1959
e-mail: turnec@dnr.state.wi.us

An electronic copy of the proposed rule may be obtained by contacting Ms. Turner

REPORT TO LEGISLATURE

NR 811, Wis. Adm. Code
Development of an aquifer storage recovery well or the
operation of an ASR system by a municipal water utility

Board Order No. DG-33-01
Clearinghouse Rule No. 02-013

Statement of Need

In February, 1999, water utility officials from Oak Creek and Green Bay requested that the Department establish a policy on the construction of aquifer storage recovery (ASR) wells and the operation of ASR systems. Operation of an ASR well is considered to be a form of underground injection. Federal regulations promulgated under the Safe Drinking Water Act require that underground injection practices be regulated in order to protect underground sources of drinking water from contamination.

The proposed rules establish definitions, performance requirements and construction requirements for aquifer storage recovery wells. The rules also outline the submittal process and information to be provided prior to DNR approval of ASR well construction or ASR system operation. The rules limit the use of ASR techniques to the underground placement of treated drinking water obtained directly via piping from a municipal water system.

During the injection phase of an ASR cycle, the ASR system must be operated in a manner that complies with state groundwater law. During the recovery phase of an ASR cycle, the water retrieved during any aquifer storage recovery well must meet state and federal drinking water standards prior to recovery into any public water system. At the completion of each ASR injection-recovery cycle, compliance with Wisconsin's groundwater law must again be demonstrated.

On a case-by-case basis, the first ASR well to be developed in each ASR system would be required to complete a DNR-approved ASR pilot test. The rule also requires DNR approval before any water recovered through an aquifer storage recovery well is placed into a public water distribution system. Additional ASR wells developed within an approved ASR system would be subject to well development testing and DNR approval before they are brought on line.

Modifications as a Result of Public Hearing

Section NR 811.91(4)(a) has been amended to clarify that the methods and results of any geochemical modeling performed to assist in identifying potential ASR well sites is to be included in the preliminary hydrogeologic report that is submitted to the DNR as part of any request to conduct an ASR pilot study.

Appearances at the Public Hearings and Their Position

March 12, 2002 – Madison – no appearances

March 13, 2002 – Oak Creek

In support:

Josh Isleb, Earth Tech, 1020 North Broadway, Milwaukee, WI
Kathi Ried, CM2M HILL, 135 North 84th Street, Suite 325, Milwaukee, WI

In opposition – none
As interest may appear – none

March 14, 2002 – Green Bay

In support:

Jerry Menne, Ashwaubenon Water Advisory Committee, 1099 Daisy Lane, Green Bay, WI
Ted Pamperin, Village of Ashwaubenon, 1570 Waterford Court, Green Bay, WI
Paul F. Jadin, Mayor, City of Green Bay, 100 N. Jefferson St., Room 200, Green Bay, WI
Len Teresinsky, Chair, Town of Hobart and President, Central Brown County Water Authority, 2990 South Pine Tree Road, Oneida, WI

In opposition:

Robert E. Schmitz, Clean Water Action Council – Wolf River Watershed Alliance, 1736 Carroll Avenue, Green Bay, WI
Rebecca Katers, Clean Water Action Council of Northeast Wisconsin, Inc., 1270 Main Street, Suite 120, Green Bay, WI

As interest may appear – none

Response to Legislative Council Rules Clearinghouse Report

The recommendations have been accepted, except for:

1.b. The point of standards application for determining whether or not an ASR well is in compliance with ch. 160, Stats., is the property boundary of the ASR well site. The point of injection is not considered to be a point of present groundwater use until the after an injection-storage-recovery cycle is completed.

5.a. The former phrase may be more descriptive of the ASR process, but "aquifer storage recovery" is the phrase that is more widely used by the regulated community and reflects the fact that the same well is used for dual purposes.

5.b. Once an ASR well is connected to a municipal water system, the entire water system becomes an ASR system.

5.c. Prior to operation of an ASR well, the extent of the displacement zone is theoretically determined based on the amount of water injected and the receptive properties of the aquifer. The storage bubble created by the water that was injected during an ASR cycle expands and contracts within this zone during various phases of the cycle; however, the boundary of the displacement zone remains fixed. The definition in s. NR 811.02(13) as been clarified.

5.f. "Well" is already defined in existing ch. NR 811 (s. NR 811.02(26)). "Water system" is already specifically defined in s. NR 811.02(25).

5.h. Yes, ss. NR 811.34 to 811.38 contain requirements that apply to any part of a municipal water system and would also apply to ASR system components.

5.j. Section NR 811.92(7) has been created to provide a basis for denial of an application to perform an AR system development test.

Final Regulatory Flexibility Analysis

Small business should not be directly affected by the proposed rules. There are no compliance and/or reporting requirements or any performance requirements that would be imposed on small business.

ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD RENUMBERING AND CREATING RULES

The Wisconsin Natural Resources Board proposes an order to renumber NR 811.02(4) to (28); and to create NR 811.02(4,), (5), (13), (15), (28) and (29) and subch. XIV to ch. NR 811 relating to the development of an aquifer storage recovery well or the operation of an ASR system by a municipal water utility.

DG-33-01

Analysis Prepared by the Department of Natural Resources

Statutory Authority: ss. 160.19, 280.11(1), 281.11, 281.12(1), 281.13(3), 281.17(8) and 281.41, Stats.
Statutes Interpreted: ss. 160.19(2), 160.19(3), 280.11(1), 281.17(8) and 281.41, Stats.

This action establishes Department of Natural Resources (DNR) policy regarding the development of aquifer storage recovery (ASR) wells and the operation of ASR systems by municipal water utilities.

The rules that are being proposed define terms and create regulatory requirements which are necessary to comply with existing federal regulations pertaining to the quality of drinking water provided by a public water system and the control of underground injection wells. The rules are also being proposed in order to comply with state regulations pertaining to the protection of Wisconsin's groundwater resources.

This action describes the submittal requirements for Department review of a request by a municipal water utility to develop an aquifer storage recovery well or operate an ASR system and identifies the minimum operational standards for ensuring that human health is maintained and that the groundwater resources of the state are adequately protected from contamination.

SECTION 1. NR 811.02(4) to (28) are renumbered NR 811.02(6) to (12), (14), (16) to (27) and (30) to (34), respectively.

SECTION 2. NR 811.02(4), (5), (13), (15), (28) and (29) are created to read:

NR 811.02(4) "Aquifer storage recovery" or "ASR" means placement of treated drinking water underground through a well for the purpose of storing and later recovering the water through the same well for potable use.

Note: Underground placement of water for the purpose of restoring an aquifer is not included in the definition of "aquifer storage recovery" or "ASR."

(5) "ASR system" means all of the ASR wells and related appurtenances within a municipal water system and any interconnected public water system served by the municipal water system.

(13) "Displacement zone" means the 3-dimensional subsurface region surrounding an aquifer storage recovery well into which treated drinking water is placed for storage and later recovery.

(15) "Drillhole" means any of the following:

(a) Any hole that is bored, drilled or driven.

(b) Any dug hole that is deeper than it is wide.

(c) Any excavation, shaft or other opening similar to a hole described in par. (a) or (b).

(28) "Treated drinking water" means potable water that has been subjected to treatment methods approved by the department to comply with the primary drinking water standards contained in ch. NR 809 and which is obtained directly from a municipal water system via piping from the municipal water distribution system to the point of underground injection.

(29) "Underground injection" means placement of any substance underground through a well, drillhole or water system.

SECTION 3. Chapter NR 811 Subchapter XIV is created to read:

Subchapter XIV – Aquifer Storage Recovery

NR 811.87 General. (1) Approval of the department is required prior to the construction of any aquifer storage recovery well or the conversion of any previously constructed well for use as an aquifer storage recovery well.

Note: Approval to construct or develop an aquifer storage recovery well is not an approval to operate an ASR system.

(2) Approval of the department is required prior to the operation of any aquifer storage recovery system.

Note: The department will not issue an approval to operate an ASR system until after it has reviewed and evaluated the results of an approved ASR pilot study.

(3) Only treated drinking water may be placed underground through an ASR system well.

(4) Only a municipal water system may construct an aquifer storage recovery well or operate an ASR system.

NR 811.88 ASR well performance requirements. (1) Unless the department determines that it is not technically or economically feasible, the quality of the treated drinking water to be placed underground through an aquifer storage recovery well shall comply with the preventive action limits contained in ch. NR 140 prior to underground injection. In all cases, the quality of the treated drinking water to be placed underground through an aquifer storage recovery well shall meet the primary drinking water standards contained in ch. NR 809 and may not contain any substance at a concentration that exceeds a state or federal health advisory prior to underground injection.

Note: Pursuant to s. 160.19(2)(b), Stats., the department finds that treated drinking water in a municipal water system may at times exceed preventive action limits established for iron, manganese, nitrate, nitrite, copper, lead, fluoride, asbestos, chloroform, bromoform, bromodichloromethane, and dibromochloromethane. Such exceedances may occur at the point of underground injection and within the displacement zone surrounding an aquifer storage recovery well even though the treated water being injected would remain in compliance with federal and state water quality standards for drinking water. The maximum allowable concentration of a primary drinking water contaminant in treated drinking water has been set by the United States Environmental Protection Agency at the lowest level that is considered to be technically and economically achievable at this time. The department also finds that it is not technically or economically feasible to require that residual concentrations of chloroform, bromoform, bromodichloromethane, and dibromochloromethane be removed from the injected water when a disinfection residual is desired at the wellhead to provide additional protection to the water system from potential biological contamination.

(2) All water that is retrieved through an aquifer storage recovery well shall comply with the primary drinking water standards contained in ch. NR 809 and shall be treated to provide a disinfectant residual prior to recovery into any municipal water distribution system.

(3) The quality of treated drinking water stored in a displacement zone shall at all times comply with the primary drinking water standards contained in ch. NR 809. ASR systems shall be designed and operated to maintain compliance with the groundwater standards contained in ch. NR 140, as required by s. NR 140.22. Therefore, treated drinking water stored underground in an ASR system shall comply with the applicable enforcement standards established in ch. NR 140 prior to movement beyond the property boundary of the ASR well site.

Note: An ASR well site is considered to include lands adjacent to the ASR wellhead that are directly owned by the municipal water system and any contiguous properties that are directly owned by the local unit of government of which the water system is a subunit.

(4) At the completion of each aquifer storage recovery cycle, the subsurface water in any portion of a displacement zone may not attain or exceed ch. NR 140 enforcement standards for iron, manganese, nitrate, nitrite, copper, lead, fluoride, asbestos, chloroform, bromoform, bromodichloromethane or dibromochloromethane or ch. NR 140 preventive action limits established for any other substance. The department may grant an exemption from this requirement, in accordance with s. NR 140.28, when an ASR well or ASR system is located in an area where the background concentration of a substance attains or exceeds the groundwater preventive action limit or enforcement standard established for that substance.

Note: Pursuant to s. 160.19(2)(b), Stats., the department finds that routine operation of an ASR system may result in an exceedance of the preventive action limits established for iron, manganese, nitrate, nitrite, copper, lead, fluoride, asbestos chloroform, bromoform, bromodichloromethane, and dibromochloromethane in a displacement zone. An ASR cycle is normally completed when the volume of water recovered equals the volume of water that was originally injected; however, the department recognizes that some of the treated drinking water injected during an aquifer storage recovery cycle may remain in an aquifer at the completion of the cycle and that substances present in this residual treated drinking water may result in ch. NR 140 preventive action limits being exceeded in an aquifer at the completion of an aquifer storage recovery cycle.

NR 811.89 Well construction requirements for ASR wells. (1) Each well constructed or converted for use as an aquifer storage recovery well shall be completed in a manner that complies with the well construction requirements established in ss. NR 811.16 to 811.24.

(2) Any monitoring well constructed on an ASR well site shall comply with the well construction requirements established in ss. NR 811.16 to 811.24. For the purpose of this subsection, an ASR well site is considered to include only those lands adjacent to the ASR wellhead that are directly owned by the municipal water system.

(3) Each monitoring well that is located beyond the property boundary of an ASR well site and that is constructed as part of an ASR system pilot study, ASR system development study, or for ASR operational monitoring shall comply with the monitoring well construction requirements established in ch. NR 141. For the purpose of this subsection, an ASR well site is considered to include only those lands adjacent to the ASR wellhead that are directly owned by the municipal water system.

(4) Each aquifer storage recovery well shall be enclosed within a lockable protective structure that is secured from tampering or unauthorized entry in a manner that is approved by the department.

(5) Each monitoring well shall be enclosed within a lockable protective covering and secured from tampering or unauthorized entry in a manner that is approved by the department.

NR 811.90 Equipment, appurtenances and piping for ASR wells and ASR systems. (1) Pumping equipment, appurtenances and piping that are to be installed as part of an ASR system shall comply with the requirements of ss. NR 811.34 to 811.38.

(2) Department approval shall be obtained prior to installation or modification of any well, pumping equipment, appurtenances or piping for the purpose of aquifer storage recovery.

(3) Security shall be provided for each ASR well site in a manner that is approved by the department.

NR 811.91 ASR system pilot studies. (1) Department approval is required prior to conducting any ASR system pilot study.

(2) Only a municipal water system may perform an ASR system pilot study.

(3) A request to conduct an ASR system pilot study shall be submitted to the department in writing. The request shall identify the location of each existing well that is being considered for use as an ASR well within the proposed ASR system, the location of any new well that is anticipated to be constructed for use as an

ASR well within the proposed ASR system and any additional wells that are to be used or constructed as part of the ASR system pilot study.

(4) Each request to conduct an ASR system pilot study shall contain all of the following:

(a) A preliminary hydrogeologic report that describes the methods and results of any hydrologic investigation, aquifer testing, hydrogeologic modeling or geochemical modeling performed to identify the location of the proposed ASR system well sites. The preliminary hydrogeologic report shall identify the location of each existing public or private water well and each potential source of groundwater contamination that is located within 1200 feet of the outer perimeter of the displacement zone that is calculated to be established around each of the proposed ASR wells within the proposed ASR system. The report shall also identify the well selected for further evaluation during the ASR well pilot test, identify the dimensions of the displacement zone that will be created around the designated test well, and describe the current and anticipated groundwater flow patterns found in the vicinity of the designated test well.

(b) A preliminary engineering report that provides an analysis of the technical feasibility for developing each of the potential ASR wells identified for the proposed ASR system and estimates the probable percentage of treated drinking water that would be recovered from each of the potential ASR wells during an ASR cycle.

(c) Plans and specifications for any well equipment, pumping equipment, appurtenances or piping that is to be constructed or altered in order to complete the proposed ASR system pilot study.

(d) A description of all operating procedures to be followed during the ASR well pilot study. This description shall contain details such as, but not limited to, the maximum volume of water to be placed underground, the flow rate and pressure of underground injection, the expected water storage period, anticipated water retrieval rates, and methods proposed for disposing of the water recovered during the ASR system pilot study.

(e) A description of all performance and compliance monitoring procedures to be followed during the ASR system pilot study. This description shall include a listing of the sampling locations, methods and schedules that will be used to ensure that the aquifer storage recovery well remains in compliance with the performance requirements set forth in s. NR 811.88.

(f) Plans and specifications for each monitoring well proposed as part of the ASR system pilot study. A minimum of one monitoring well is required as part of the ASR system pilot study. The department may require additional monitoring wells should the proposed ASR system encompass multiple or otherwise unique geologic formations. The department may also waive the monitoring well requirement if water quality data from other ASR system pilot studies conducted in similar geologic conditions is submitted as part of the ASR system pilot study request and is determined to be applicable by the department.

(5) The department may require modification of plans and specifications, operating procedures or compliance and monitoring procedures required in sub. (4) to ensure that compliance with the performance requirements in s. NR 811.88 can be determined.

(6) Within 180 days after completing an approved ASR system pilot study or prior to recovering any water retrieved through an ASR well into a water distribution system, a municipal water system shall submit a final report on the ASR system pilot study to the department.

NR 811.92 ASR system development testing. (1) Department approval shall be obtained prior to any ASR system development testing.

(2) Following the completion of an approved ASR system pilot study, each additional ASR well that is to be developed within an ASR system shall be subject to ASR system development testing.

(3) The department may require monitoring wells to be installed as part of an ASR system development test if it finds any of the following:

(a) Geologic conditions in the vicinity of the proposed ASR well are not consistent with the conditions examined during the municipal water system's ASR system pilot study.

(b) Geologic conditions in the vicinity of the proposed ASR well are not consistent with the conditions reported in other ASR system pilot studies or ASR system development tests performed by other municipal water systems.

(c) Results obtained during the municipal water system's ASR system pilot study or other aquifer tests indicate that additional monitoring is warranted to ensure compliance with the water quality standards established in chs. NR 140 and 809.

(4) Each request for an ASR system development test shall include a report or testing plan that contains the following:

(a) A comparison of the hydrogeologic conditions and formations found at the ASR system pilot study well site and any well site that is to be evaluated as part of the ASR system development testing request.

(b) An evaluation of the municipal water system's ASR system pilot test results and the transferability of those results to any well that is to be included as part of the ASR system development test.

(c) Plans and specifications for any well equipment, pumping equipment, appurtenances or piping that is to be constructed or altered as part of the ASR system development test.

(d) A description of all operating procedures to be followed during the ASR system development test. This description shall contain details such as, but not limited to, the volume of water to be placed underground, the flow rate and pressure of underground injection, backflushing schedules, the expected water storage period, anticipated water retrieval rates and methods for disposing of water recovered during the ASR system development test.

(e) A description of all performance and compliance monitoring procedures to be followed during the ASR system development test.

(f) A description of any monitoring wells proposed to be constructed or utilized during the ASR system development test.

(5) The department may require modification of plans and specifications, operating procedures or compliance and monitoring procedures required under sub. (4) to ensure that compliance with the performance requirements in s. NR 811.88 can be determined.

(6) Within 180 days after completing an approved ASR system development test or prior to recovering any water retrieved through any newly developed aquifer storage recovery well into a water distribution system, the municipal water system conducting the test shall submit a final report containing the final results of the investigation to the department.

(7) The department may deny a request to perform an ASR system development test if it determines that the test cannot be conducted in a manner that is protective of human health or the environment. Whenever a request to perform an ASR system development test is denied, the department shall provide the person who submitted the request for an ASR development test with a written explanation of the reasons for denying the request.

NR 811.93 Operating an ASR system. (1) Department approval to operate an ASR system shall be obtained prior to recovery of any water retrieved through an aquifer storage recovery well into a municipal water system.

(2) Only a municipal water system may submit a request to operate an ASR system.

(3) Completion of an ASR pilot study is required before a municipal water system may submit a request to operate an ASR system.

(4) Completion of an ASR system development test and approval of the department is required before any additional aquifer storage recovery well that was not approved as part of an original request to operate an ASR system is connected to the existing ASR system.

(5) A request to operate an ASR system shall be submitted to the department in writing and shall contain the following:

(a) A copy of the final report of the approved ASR system pilot study and copies of any approved ASR system development studies conducted by the municipal water system.

(b) A final plans and specifications report that describes the components of the ASR system. The final plans and specifications report shall include as built drawings for each aquifer storage recovery well and each monitoring well that was constructed as part of the ASR system pilot study or ASR system development study. The report shall also include descriptions of pumping equipment, piping and other appurtenances that are installed or required for ASR system operation.

(c) A proposed final operating plan that describes the entire ASR cycle and shows how the ASR system will be integrated into municipal water system operations. The proposed final operating plan shall include details such as, but not limited to, the total volume of water to be injected, rate of injection, pressure of injection, length of the water storage period, rate of recovery, post-recovery water treatment techniques necessary to maintain a distribution system disinfectant residual, and methods for disposing of any water that cannot be recovered into the water distribution system.

(d) A proposed demand management and water accountability plan that describes actions which the municipal water system is currently conducting or will be initiating to ensure that groundwater and surface water resources are conserved and used as efficiently as possible.

(e) A proposed compliance and monitoring plan that lists all sampling parameters and provides details on monitoring schedules, monitoring locations, sampling methods and quality assurance techniques that will be followed to ensure that compliance with the requirements set forth in s. NR 811.88 is maintained. The compliance and monitoring plan shall provide for testing of the water that is to be injected, stored and recovered through each aquifer storage recovery well and for the groundwater present in any monitoring well that is installed as part of the ASR system. Parameters to be analyzed for each water quality sample collected, the locations for sample collection and the frequency at which water quality samples are to be collected shall be determined by the department following a review of the final ASR system pilot study report or ASR system development study report, the proposed operating plan, the proposed monitoring plan and the drinking water quality monitoring schedule currently followed by the municipal water system. Unless otherwise specified by the department, all water quality results obtained from ASR system compliance monitoring activities shall be compiled and submitted to the department on an annual basis and at least 45 days prior to the start of each new ASR cycle.

(6) The department may require modification of any plans and specifications, operating plans, demand management and water accountability plans or compliance and monitoring plans required in sub. (5) in any manner necessary to ensure compliance with the performance standards set forth in s. NR 811.88.

(7) If requested, the department may consider and approve the modification of plans and specifications, operating plans, demand management and water accountability plans or compliance and monitoring plans required in sub. (5) if information submitted in support of a requested modification demonstrates to the satisfaction of the department that the proposed modifications will continue to ensure compliance with the standards set forth in s. NR 811.88 and any other applicable requirements contained in ch. NR 811.

The foregoing rule was approved and adopted by the State of Wisconsin Natural Resources Board on August 14, 2002.

The 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.

Dated at Madison, Wisconsin _____.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

By _____.
Darrell Bazzell, Secretary

(SEAL)