Form 1100-001
(R 12/09)

NATURAL RESOURCES BOARD AGENDA ITEM

Item No. 3.A.1

SUBJECT: Adoption of Board order DG-24-09, revisions to ch. NR 140, Wis. Adm. Code, relating to groundwater quality standards

FOR: AUGUST 2010 **BOARD MEETING**

TO BE PRESENTED BY: Michael D. Lemcke - Chief, Groundwater Section

SUMMARY:

Amendments are proposed to ch. NR 140 to establish new state groundwater quality standards for 15 substances of public health concern and to revise existing groundwater quality standards for 15 additional substances of public health concern. Of the 15 proposed revised groundwater standards, 9 are proposed to be less restrictive than their current standards.

At the April, 2010 Natural Resources Board meeting the Board passed a motion to table Board Order DG-24-09 until, at the latest, the August 2010 Board meeting. At the Board's direction, the Department solicited additional information related to the proposed groundwater standards for aluminum and, based on a review of this additional information, the Department has revised its recommendation for a ch. NR 140 aluminum preventive action limit.

The Department has not changed its other recommendations for new and revised ch. NR 140 groundwater quality standards.

RECOMMENDATION: Adoption of Board Order DG-24-09, revisions to ch. NR 140 relating to groundwater quality standards

LIST OF ATTACHED MATERIALS:

No	☐	Fiscal Estimate Required	Yes	☑	Attached
No	☑	Environmental Assessment or Impact Statement Required	Yes	☐	Attached
No	☐	Background Memo	Yes	☑	Attached

APPROVED:

Bureau Director, Jill D Jonas — Date 7/13/2010

Administrator, — Date 7/22/10

Secretary, Matt Frank — Date 7-29-10

cc: Laurie J. Ross - AD/8
Jill Jonas - DG/5
Mike Lemcke - DG/5
Judy Ohm - LS/8
Paul Neumann - MB/8
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CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: **July 14, 2010** FILE REF: NR 140

TO: **Members, Natural Resources Board**

FROM: **Matthew J. Frank, Secretary**

SUBJECT: **Recommendation for adoption of proposed amendments to Wis. Adm. Code Chapter NR 140, Groundwater Quality**

Wisconsin state groundwater quality standards are established by the Department of Natural Resources (Department) for substances of public health or welfare concern that are detected in, or have a reasonable probability of entering the groundwater resources of the state. The Department is proposing amendments to ch. NR 140 to add new state groundwater standards for 15 substances of public health concern and to revise existing groundwater standards for 15 substances of public health concern.

At the April 2010 Natural Resources Board (NRB) meeting the Department recommended Board adoption of the proposed amendments to ch. NR 140. Following a discussion of the proposed aluminum groundwater quality standards the Board requested that the Department review information related to those proposed groundwater quality standards and return with recommendations for any changes to the proposed standards by, at the latest, the August, 2010 NRB meeting.

The Department held a meeting on May 20, 2010 with representatives of the Wisconsin Energies Corporation - We Energies subsidiary to listen to their concerns related to the proposed groundwater standards for aluminum. At this meeting We Energies presented a written summary of their concerns with the proposed standards (Attachment 4). We Energies concerns focus on the methodology used by the Wisconsin Department of Health Services (DHS) to develop their recommendations for aluminum groundwater quality standards.

We Energies comments included toxicity values established for aluminum by national and international organizations and a discussion of DHS' development of their recommendation for an aluminum NR 140 enforcement standard (ES) of 200 parts per billion (ppb). Comments were provided related to the animal toxicity study used by DHS to develop their recommendation, and on the uncertainty factors used by DHS in its calculation of a recommended standard. We Energies also supplied information related to carcinogenicity evaluations conducted for aluminum and recommended that a ch. NR 140 aluminum ES be established at 5,000 ppb, and a ch. NR 140 preventive action limit (PAL) for aluminum be established at 20% of this ES value.

The Department requested that DHS staff review the comments and information submitted by We Energies and provide a response to the issues raised. DHS staff reviewed the aluminum information document submitted by We Energies [prepared by Lisa Bradley (AECOM) and Robert Paulson (We Energies)] and provided a written response (Attachment 5) to the Department.

On June 3, 2010 a second meeting/conference call was held with We Energies at which DHS presented their responses to We Energies concerns related to DHS development of proposed aluminum groundwater standards. In their response, DHS stated that they have conducted a comprehensive review of the toxicology literature for aluminum and that they do not support increasing the proposed aluminum ES (of

200 ppb) to 5,000 ppb - 37,000 ppb, as proposed by We Energies' consultant. DHS pointed out that, in their development of recommended aluminum standards, they used standard toxicological risk assessment methodology, used a lowest observable effect level (LOEL) from a valid and relevant scientific study and, incorporated standard risk assessment uncertainty factors into their calculations. While DHS believes there is a strong weight of evidence supporting use of a PAL established at 10% of the recommended ES value (a "10% PAL"), it does recognize that a scientific case can also be made for a "20% PAL" and, therefore, would support a PAL set at either 10% or 20% of the proposed ES value for aluminum.

The Department has confirmed, based on an evaluation of Waste and Materials Management Program regulations, that it does not appear that the state groundwater quality standards proposed for aluminum would affect landfill monitoring programs, or current approved beneficial reuses of coal combustion byproducts (Attachment 6). It is the Department's understanding that We Energies is not aware that any of their sites would have an issue with the proposed aluminum groundwater quality values. In addition to the discussion of standards development, DHS offered to provide the results of private water supply well testing, conducted by County Health Departments (fee-exempt well testing program), which show that background levels of aluminum in Wisconsin groundwater are relatively low (Attachment 7).

In conclusion, based on meetings with We Energies and reevaluation of relevant information, with input from DHS, the Department is proposing to keep the existing proposed aluminum groundwater quality ES value of 200 ppb. Furthermore, based on the information provided by DHS in its *Response to Comments from WE Energies* document and, considering that a scientific case can be made for a non-carcinogen based PAL groundwater standard for aluminum, the Department is proposing a PAL of 40 ppb, 20% of the proposed ES for aluminum (see proposed Rule Order, page 7, Table 1).

1. Why rule is being proposed

Wisconsin state groundwater quality standards are established by the Department of Natural Resources for substances of public health or welfare concern that are detected in, or have a reasonable probability of entering the groundwater resources of the state.

These groundwater quality standards are established in Wisconsin Administrative Code Chapter NR 140, Groundwater Quality. Amendments are being proposed to ch. NR 140 to:

1) add new state groundwater quality standards for 15 substances of public health concern to s. NR 140.10, Wis. Adm. Code.

2) revise existing s. NR 140.10, Wis. Adm. Code, groundwater quality standards, for 15 substances of public health concern.

3) make minor revisions and additions to update s. NR 140.10, Wis. Adm. Code, Table 1 and Appendix I to Table 1.

Chapter NR 140 was adopted by the Natural Resources Board in 1985 to comply with Wisconsin Statute Chapter 160. Chapter 160, Stats., was created in May of 1984, as part of 1983 Wisconsin Act 410, and requires the Department of Natural Resources to develop groundwater quality standards for substances detected in, or having a reasonable probability of entering the groundwater resources of the state.

Chapter NR 140 establishes state groundwater quality standards at two levels, preventive action limit (PAL) and enforcement standard (ES). In accordance with ch. 160, Stats., ES groundwater quality standards for substances of public health concern are established based on recommendations received from the Department of Health Services (DHS). PAL groundwater quality standards for substances of public health concern are set at either 20% of the concentration of the established ES, or at 10% of the concentration of the established ES if the substance has carcinogenic, mutagenic or teratogenic properties, or interactive effects.

Wisconsin groundwater quality standards are used by state regulatory agencies to develop clean up goals at contaminated sites, to establish design and management criteria for regulated activities and to ensure that regulated facility practices do not endanger state drinking water supplies.

The Department is required to consult with other state agencies, and to consider individual petitions submitted by members of the public, in identifying substances for possible groundwater quality standard setting. State regulatory agencies provided the Department information on the occurrence of substances without standards detected in groundwater, and members of the public requested that the Department review recent groundwater monitoring information related to additional chemicals currently without standards.

DHS staff reviewed existing regulatory and toxicological information for identified substances of potential health concern and developed recommendations for state groundwater quality standards. In accordance with ch. 160, Stats., the Department is proposing rules establishing the DHS recommendations as groundwater quality standards in ch. NR 140.

2. Summary of the rule

Amendments to Chapter NR 140 are being proposed to add new state groundwater quality standards for 15 substances, as indicated below:

	Proposed Standards (ug/L - except as noted)	
Substance	**ES**	**PAL**
1,4-Dioxane (p-dioxane)	**3**	**0.3**
Acetochlor	**7**	**0.7**
Acetochlor ethane sulfonic acid + oxanilic acid (Acetochlor-ESA + Acetochlor-OXA)	**230**	**46**
Aluminum	**200**	**40**
Ammonia (as N)	**9.7 mg/L**	**0.97 mg/L**
Chlorodifluoromethane (HCFC-22)	**7 mg/L**	**0.7 mg/L**
Chlorpyrifos	**2**	**0.4**
Dimethenamid/Dimethenamid-P	**50**	**5**
Dinitrotoluene, Total Residues	**0.05**	**0.005**
Ethyl Ether (Diethyl Ether)	**1000**	**100**
Manganese	**300**	**60**
Metolachlor ethane sulfonic acid + oxanilic acid (Metolachlor-ESA + Metolachlor-OXA)	**1.3 mg/L**	**0.26 mg/L**
Perchlorate	**1**	**0.1**
Propazine	**10**	**2**
Tertiary Butyl Alcohol (TBA)	**12**	**1.2**

Note, after review of comments and new information received during the rulemaking public comment period, DHS revised their original standards recommendations for three substances: acetochlor, aluminum and perchlorate. The recommendation for acetochlor standards was revised, from an ES of 1 ppb and PAL of 0.1 ppb, to an ES of 7 ppb and PAL of 0.7 ppb. The recommendation for aluminum standards was revised, from an ES of 170 ppb and PAL of 17 ppb, to an ES of 200 ppb and PAL of 20 ppb. The recommendation for perchlorate standards was revised, from an ES of 7 ppb and PAL of 0.7 ppb, to an ES of 1 ppb and PAL of 0.1 ppb. After the April 2010 NRB meeting the Department revised the proposed aluminum groundwater quality PAL standard from 20 ppb to 40 ppb (20% of the proposed aluminum ES value). This change was based on information provided by DHS in its May 25, 2010 *Response to Comments from WE Energies* document.

Amendments to Chapter NR 140 are being proposed to revise existing state groundwater quality standards for 15 substances as indicated below:

	Current Standards (ug/L - except as noted)		**Proposed Standards (ug/L - except as noted)**	
Substance	**ES**	**PAL**	**ES**	**PAL**
1,3-Dichlorobenzene	**1250**	**125**	**600**	**120**
1,3 Dichloropropene (cis/trans)	**0.2**	**0.02**	**0.4**	**0.04**
Acetone	**1000**	**200**	**9 mg/L**	**1.8 mg/L**
Boron	**960**	**190**	**1000**	**200**
Carbaryl	**960**	**192**	**40**	**4**
Chloromethane	**3**	**0.3**	**30**	**3**
Dibutyl phthalate	**100**	**20**	**1000**	**100**
Ethylene Glycol	**7 mg/L**	**700**	**14 mg/L**	**2.8 mg/L**
Methyl ethyl ketone (MEK)	**460**	**90**	**4 mg/L**	**0.8 mg/L**
Metolachlor	**15**	**1.5**	**100**	**10**
Metribuzin	**250**	**50**	**70**	**14**
Phenol	**6 mg/L**	**1.2 mg/L**	**2 mg/L**	**0.4 mg/L**
Prometon	**90**	**18**	**100**	**20**
Toluene	**1000**	**200**	**800**	**160**
Xylene	**10 mg/L**	**1 mg/L**	**2 mg/L**	**0.4 mg/L**

Amendments to ch. NR 140 are also being proposed to make minor revisions and additions to ch. NR 140 Table 1 and Appendix I, as indicated below:

- Replacing current "Chromium" in ch. NR 140 Table 1 with "Chromium (total)" to clarify that ch. NR 140 standards apply to total chromium (combination of chromium III and chromium VI).
- Replacing current "Cyanide" term in ch. NR 140 Table 1 with "Cyanide, free" to clarify that ch. NR 140 standards apply to "free cyanide" (HCN, CN^- and metal-cyanide complexes that are easily dissociated into free cyanide ions).
- Changing "Metolachlor" in ch. NR 140 Table 1 to "Metolachlor/s-Metolachlor" to clarify that ch. NR 140 standards apply to both Metolachlor (CAS RN 51218-45-2) and its stereo isomer, s-Metolachlor (CAS RN 87392-12-9).

- Revising units for field specific conductance in s. NR 140.20 Table 3 from micromhos/cm (micromhos per centimeter) to microSiemens/cm (microSiemens per centimeter or µS/cm).
- Revising s. NR 140.28(5)(c)6 note to add "for discharges, as defined by s. 283.01(4), Stats" language related to the need for a wastewater discharge permit.
- Adding CAS RN of 142363-53-9 for Alachlor-ESA to Appendix I to Table 1.
- Changing existing Appendix I to Table 1 CAS RN for Asbestos from 12001-29-5 (chrysotile asbestos) to 1332-21-4 (asbestos, all forms).
- Adding "Chromium (total)", with CAS RN of 7440-47-3, to ch NR 140 Appendix I to table 1.
- Adding CAS RN of 542-75-6 for cis/trans 1,3 Dichloropropene (mixed isomers) to ch. NR 140 Appendix I to Table 1.
- Changing existing Appendix I to Table 1 CAS RN for Fluoride from 16984-48-8 to 7681-49-4.
- Adding 1,1,1,2-PCA synonym for 1,1,1,2 tetrachloroethane to ch. NR 140 Appendix I to table 1.
- Adding 1,1,2,2-PCA synonym for 1,1,2,2 tetrachloroethane to ch. NR 140 Appendix I to table 1.
- Adding 1,1,1-TCA synonym for 1,1,1 trichloroethane to ch. NR 140 Appendix I to table 1.

3. How proposal affects existing policy

The proposed amendments continue the existing policy of protecting Wisconsin's groundwater by utilizing the procedures in ch. 160, Stats., to establish new state groundwater quality standards for 15 substances. These new groundwater quality standards would be added to the present ch. NR 140 groundwater standards. There are currently standards for 131 substances of public health and welfare concern. Existing state groundwater standards for 15 substances would be revised. The addition of new standards, and revision of existing standards, does not affect the evaluation and response procedures in ch. NR 140 used by regulatory programs when standards are attained or exceeded.

4. Hearing Synopsis

At the October 2009 Natural Resources Board meeting the Board authorized the Department to hold public hearings and solicit comments on proposed amendments to ch. NR 140. The Department held five public hearings, Dec. 11, 2009 through Dec. 16, 2009, and accepted written comments through Dec. 30, 2009. A total of 16 people attended the hearings and presented oral and written comments. The ch. NR 140 public hearings, conducted by staff from the Bureaus of Drinking Water & Groundwater and Legal Services, were as follows:

Dec. 11, 2009 in Madison, WI: 5 people attended, 4 hearing appearance slips were submitted (1 "As interest may appear", 3 "In support", and 1 slip not marked), 1 oral comment was made and 1 written comment was submitted.

Dec. 14, 2009 in Baraboo, WI: 5 people attended, 3 hearing appearance slips were submitted (1 "As interest may appear", 1 "In support" and 1 "In opposition"), 2 oral comments were made and 1 written comment was submitted.

Dec. 15, 2009 in Eau Claire, WI: 2 people attended. No hearing appearance slips were submitted and no oral or written comments were received at this hearing.

Dec. 15, 2009 in Stevens Point, WI: 3 people attended, 2 hearing appearance slips were submitted (2 "In support"), 2 oral comments were made and 2 written comments were submitted.

Dec. 16, 2009 in Oshkosh, WI: 1 person attended and signed a hearing appearance slip, "As interest may appear". No oral or written comments were received at this hearing.

5. Summary of Public Comments

During the public comment period the Department received comments both in support of, and in opposition to, the proposed amendments to ch. NR 140. Comments on proposed code clarification language and information related to toxicity risk assessments were also received. In general, comments were received that:

- support establishing health based standards for manganese and encourage reevaluation of these standards, as new research results on health impacts become available;
- recommend re-review of the available toxicity information for dinitrotoluenes, or deferral of standards until additional toxicity assessment studies are completed; suggest laboratory analytical methods for DNT isomers are not currently low enough to allow an evaluation of compliance with the proposed standards to be made;
- support regulation of the six dinitrotoluene isomers as a single entity, and an enforcement standard set at the same level as the health advisory level established by the WI DHS;
- support the regulation of perchlorate, pointing out that there are several population subgroups that may be affected by very low levels in food or water, and recommend establishing a lower, "more protective", enforcement standard;
- note that there is a more recent (Jan. 2007) EPA cancer risk assessment available for acetochlor and recommend that the proposed groundwater quality standards be recalculated;
- oppose the proposed combined standard for the two acetochlor degradation products (ESA and OXA) since the "mode of action" of these chemicals is unknown and thyroid hormone effects on test animals are not the same for both substances;
- request federal reference and risk exposure levels for aluminum be reviewed, aluminum toxicity studies used to develop standards be re-evaluated and the total uncertainty factor used to calculate the enforcement standard be reconsidered;
- note that there are agricultural chemicals, applied to relatively large percentages of potato and corn crop acres, that currently do not have state groundwater standards, and therefore a more proactive, "precautionary" approach to groundwater protection in Wisconsin, and consideration of health threats posed by mixtures of pesticides and metabolites, and residues and nitrate nitrogen is needed.

A separate Response to Public Comments **(Attachment 1)** document provides detailed responses to comments received. The Department of Health Services has also provided responses **(Attachment 2)** to comments and information received related to toxicity assessment studies and their development of new standards. Based on comments and information submitted during the public comment period DHS has revised their recommendations for acetochlor, aluminum and perchlorate groundwater quality standards **(Attachment 3)**.

6. Environmental Analysis

Section NR 150.03, Wis. Adm. Code, (Environmental Analysis and Review Procedures for Department Actions) describes the appropriate categories for various proposed Departmental actions. The Department has determined that this rule proposal is a Type III action. Type III actions normally do not have the potential to cause significant environmental effects, normally do not significantly affect energy usage and normally do not involve unresolved conflicts in the use of available resources. This rule proposal is not expected to cause any of these effects. In accordance with s. 150.20, Wis. Adm. Code, Type III actions do not require an environmental assessment (EA) or environmental impact statement (EIS).

7. Small Business Regulatory Flexibility Analysis

The Department does not believe that the proposed rule will have a significant economic impact on a substantial number of small businesses. The compliance and reporting requirements in ch. NR 140 are not changed by the proposed amendments. If a groundwater quality standard is exceeded, the owner or operator of a facility, practice or activity, including any small business, must report the violation to the appropriate regulatory agency. There would be 15 new substances for which a facility may have to monitor and report exceedances and 15 additional substances with revised standards. Of the 15 revised standards, 9 are proposed to be less restrictive than their current standard.

Chapter 160, Stats., requires establishment of both design and performance standards. Individual state agency regulatory programs establish design and operational standards in their specific program rules. Performance standards (groundwater quality standards) are contained in ch. NR 140. Chapter 160, Stats., does not allow for less stringent schedules, deadlines or reporting requirements, or for exemptions to remedial action, when a groundwater quality standard is attained or exceeded, based on the size of the business causing the contamination.

There would be adverse impacts on public health, welfare, safety and the environment if small businesses were not required to meet regulatory reporting requirements and implement remedial responses. The more quickly contamination can be evaluated and responses initiated, the less likely that public health safety and welfare will be adversely affected. If small businesses were exempt from these requirements, groundwater contamination would continue unabated at least until the Department could appropriate sufficient resources to undertake this work. The delay, or possibility that nothing would be done, would lead to adverse impacts on public health, welfare, safety and the environment.

The type of small businesses that are typically impacted by ch. NR 140 include dry cleaners, small manufacturers, agricultural cooperatives, farmers, underground storage tank owners, small solid waste disposal facilities, small wastewater treatment operations, as well as others. In effect, any small business that has a permitted or unpermitted discharge of a substance exceeding the health or welfare groundwater quality standards listed in ch. NR 140 is responsible for responding to the release consistent with the requirements of ch. NR 140.

There will be 15 additional new groundwater quality standards, and 15 revised standards, which would be used as design and compliance standards, and for clean-up standards in the event of a spill or unpermitted discharge. If remedial action or other response is necessary, the individual programs which regulate the

facility, practice or activity would determine the appropriate level of clean-up required. As the cost of remedial options varies, the cost of remediation of groundwater contamination for small businesses will vary, depending on the complexity of the site and contamination at the facility, practice or activity, and federal and state laws that are being used to guide the remedial action.

The majority of the substances for which new groundwater quality standards are proposed have already been detected in groundwater at one or more sites in Wisconsin. The adoption of design, compliance and clean-up standards for these substances may aid small businesses in a number of ways. The standards will provide specifications for facility and activity design purposes, inform whether a substance detected in groundwater does or does not exceed a standard and, if it does, let a small business know when the clean-up efforts are finished based on standards being met. When substances are detected in groundwater for which a standard does not exist in ch. NR 140, the Department may require clean-up of the groundwater "to the extent practicable" which may be overly conservative depending upon the actual toxicity of the substance detected.

Attachments:

Attachment 1	RESPONSE TO PUBLIC COMMENTS
Attachment 2	Memo from the Wisconsin Dept. of Health Services (dated Feb. 10, 2010) with responses to comments on their groundwater quality standard recommendations
Attachment 3	February 2010 Wisconsin Dept. of Health Services *Scientific Support Documentation for Cycle 9, Revisions of NR 140.10, Groundwater Enforcement Standard & Preventive Action Limit Recommendations*
Attachment 4	We Energies - *Summary of Concerns with WDHS ES/PAL for Aluminum*
Attachment 5	WI Dept. of Health Services – May 25, 2010 *DHS Response to Comments from WE Energies*
Attachment 6	July 8, 2010 Memo from Ed Lynch, DNR Waste and Materials Management Program, to Mike Lemcke, DNR Drinking Water & Groundwater Program, assessment of potential impacts of new aluminum groundwater standards on Environmental Monitoring for Landfills and Beneficial Use of Industrial Byproducts
Attachment 7	County Health Department fee-exempt well testing program - summary of metals sampling results 2007 - 2009

RESPONSE TO PUBLIC COMMENTS
March, 10, 2010

Revisions to ch. NR 140, Wis. Adm. Code, to amend NR 140.10 Table 1 and Appendix 1, relating to groundwater quality standards

Natural Resources Board Order No. DG-24-09

Introduction

In October of 2009, the Natural Resources Board authorized the Department to hold pubic hearings and solicit comments on proposed revisions to ch. NR 140, "Groundwater Quality". The proposed rule package included establishing new state groundwater quality standards for 15 substances and revising existing state groundwater quality standards for 15 additional substances. In addition, minor revisions and additions were proposed to update and clarify rule language.

Five public hearings were held in December of 2009. A total of 16 people attended these hearings. Two marked hearing appearance slips "As interest may appear", 6 marked hearing appearance slips "In support" of the proposed rule revisions and 1 marked their hearing appearance slip "In opposition" to the proposed rule revisions. 5 oral statements were made at the hearings and 4 written comments were submitted.

Written comments on the proposed rule revisions were accepted through Dec. 30, 2009. Approximately 152 letters, postcards, e-mails and information documents were received by the Department during the rule public comment period.

The Response to Public Comments document is organized in two sections. Section I covers comments received at the public hearings and submitted during the rule comment period. Section II addresses comments received from the Wisconsin Legislative Council Rules Clearinghouse.

Comments related to the interpretation of toxicologic studies and the risk assessment methodology used by the WI Dept. of Health Services (DHS) to develop their recommendations for new and revised state groundwater quality standards have been responded to by DHS staff. These responses are included in a DHS memo, dated Feb. 10, 2010 (Attachment 2). Revised DHS recommendations for groundwater quality standards are included in the DHS (Feb. 2010) *Scientific Support Documentation for Cycle 9, Revisions of NR 140.10, Groundwater Enforcement Standard & Preventive Action Limit Recommendations* document (Attachment 3).

I. Oral and written comments received by the Department on proposed rule revisions

The following acronyms and abbreviations are used to identify commenting organizations in this section:

WE	We Energies (Wisconsin Electric Power Co. and Wisconsin Gas Co.)
DA	Dept. of the Army (Office of Regional Environmental and Government Affairs -Northern)
CSWAB	Citizens for Safe Water Around Badger
ARP	Acetochlor Registration Partnership (Dow AgroSciences, LLC and Monsanto Co.)
PC	Portage County - Planning and Zoning Department
TA	Test America, Inc.

1. **Comment:** Recommended that the Department re-review the available toxicity information for dinitrotoluenes and conduct an independent peer review of this toxicity evaluation, and recommended that the Department defer developing standards for "dinitrotoluene, total residues" groundwater quality standards until after the U. S. Army Public Health Command completes their provisional dinitrotoluene toxicity assessment studies. (DA)

   Response: This information has been reviewed and the proposed standards remain unchanged. The DHS addresses specific technical comments in their Response to Comments document (Attachment 2), see response 3.

2. **Comment:** Laboratory analytical methods for dinitrotoluene isomers are not currently low enough to allow an evaluation of compliance with the proposed standards to be made. (DA)

   Response: Note that s. NR 140.16(2) requires a laboratory to utilize an analytical methodology that produces the lowest available limits of detection, and that s. NR 140.14(3), provides guidance for dealing with situations where groundwater quality standards are equal to, or less than, laboratory limits of quantitation. The DHS addresses this in its Response to Comments document (Attachment 2), see response 3.

3. **Comment:** Multiple comments supporting regulation of the six dinitrotoluene isomers as a single entity, and a groundwater ch. NR 140 enforcement standard set at the same level as the health advisory level for total residues of dinitrotoluene established by the WI DHS. (CSWAB & others)

   Response: The proposed standards regulate the six isomers of dinitrotoluenes as a single entity. The DHS addresses this in its Response to Comments document (Attachment 2), see response 4.

4. **Comment:** Multiple comments made recommending establishment of a lower, "more protective", enforcement standard for perchlorate than proposed in the rule amendments because there are several subgroups, such as pregnant women, people with low iodine intake and those who consume food with iodine uptake blockers, that may be affected by very low levels of perchlorate in food and water. (CSWAB & others)

   Response: The proposed standards have been lowered. The DHS addresses this in its Response to Comments document (Attachment 2), see response 4.

5. **Comment:** Oppose the proposed acetochlor groundwater quality standards as there is a more recent EPA cancer risk assessment (Jan. 2007) available than the one used by DHS to develop the proposed standards. Recommend recalculating the proposed acetochlor groundwater quality standards using the more recent acetochlor cancer risk assessment. (ARP)

   Response: This information has been reviewed and a less stringent standard is proposed. The DHS addresses this in its Response to Comments document (Attachment 2), see response 1.

6. **Comment:** Recommendation made to develop individual standards for each of the two acetochlor degradation products, acetochlor-ethane sulfonic acid (acetochlor-ESA) and acetochlor-oxanilic acid (acetochlor-OXA), as the "mode of action" of these chemicals is

unknown, and because the thyroid hormone effect on test animals is not the same for both substances. Recommendation made to use an uncertainty factor consistent with federal guidance when developing these standards. (ARP)

Response: This information has been reviewed and the proposed standards remain unchanged. The DHS addresses this in its Response to Comments document (Attachment 2), see response 1.

7. **Comment:** Recommendation made to review three potentially relevant federal regulatory levels for aluminum during ch. NR 140 groundwater standards development. These regulatory levels are: US EPA tap water Regional Screening Level (RSL) for aluminum of 37 mg/L (37,000 ppb), US EPA Superfund Program Provisional Peer Reviewed Toxicity Value (PPRTV) for aluminum of 1 mg/kg/day, and Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Level (MRL) for aluminum of 1 mg/kg/day. (WE)

   Response: This information has been reviewed and a less stringent standard is proposed. The DHS addresses this in its Response to Comments document (Attachment 2), see response 2.

8. **Comment:** Recommendation made to re-evaluate the results of the 2005 Yousef et al. rabbit study, used to develop the DHS recommended aluminum standards and to reconsider the total uncertainty factor used in the calculation of the proposed aluminum groundwater enforcement standard. (WE)

   Response: This information has been reviewed and a less stringent standard is proposed. The DHS addresses this in its Response to Comments document (Attachment 2), see response 2.

9. **Comment:** Individual commenter noted that there are agricultural chemicals, applied to relatively large percentages of potato and corn crop acres, that currently do not have state groundwater quality standards. Suggestion made to utilize a more proactive, "precautionary" approach to groundwater protection in Wisconsin.

   Response: The WI Dept. of Agriculture, Trade & Consumer Protection (DATCP) periodically conducts surveys evaluating the occurrence of agricultural chemicals in groundwater. The Department will forward comments related to agricultural chemicals applied to Wisconsin crops to DATCP for possible inclusion in future surveys.

10. **Comment:** Need to consider the health threats posed by mixtures of pesticides and pesticide metabolites, and by pesticide residues and nitrate nitrogen. (PC)

    Response: This information has been reviewed and, in part, is included in the existing process. The DHS addresses this in its Response to Comments document (Attachment 2), see response 5.

11. **Comment:** Need to clarify, in ch. NR 140, what analytical methods could be used as acceptable measures of "free cyanide" in groundwater. (WE & TA).

    Response: A note has been added to s. NR 140.10, Table 1 clarifying what laboratory analytical methods are acceptable for "free cyanide".

II. Wisconsin Legislative Council Rules Clearinghouse report comments

One comment was received from the Legislative Council Rules Clearinghouse on Clearinghouse Rule CR09-102 "Form, Style and Placement in Administrative Code":

Comment: Provide a definition for the symbol µS, proposed to be used for field specific conductance, or keep current "micromho" units term.

Response: The µS symbol was replaced in the proposed code amendments with the term "microSiemens".

Attachment 2

Cycle 9 Groundwater Standard Revisions

Response to Comments

Prepared by Lynda Knobeloch, Ph.D., Senior Toxicologist
Wisconsin Department of Health Services
February 10, 2010

1. Acetochlor Registration Partnership (ARP)

The Acetochlor Registration Partnership (ARP) provided new information regarding EPA's re-assessment of acetochlor. In 2007, the EPA withdrew the cancer slope factor for acetochlor, changing its classification from "probable" to "suggestive" and recommended a threshold approach to risk assessment. The ARP also recommended revising the proposed standards for the ESA and OXA metabolites of acetochlor. Their justification for revision included, in part, current federal risk assessment guidelines which do not allow uncertainty factors to exceed 3,000. ARP also argued that these metabolites should be regulated separately explaining that the toxicity profiles are not 'virtually the same" as stated in the supporting document because one caused thyroid hormone levels to increase, while the other was associated with lower hormone levels.

Response: Following review of the January 3, 2007 report prepared by the EPA's Cancer Assessment Review Committee, DHS has updated the support document for acetochlor and revised the proposed ES from 1 µg/L to 7 µg/L. The newly proposed standard was developed using the federal reference dose with an additional uncertainty factor of 10 to protect against possible oncogenic effects. The proposed PAL has been adjusted to 0.7 µg/L.

With regard to comments regarding the uncertainty factors used to develop the proposed standard for acetochlor metabolites, Wisconsin state statute Chapter 160.13.2(b3) lists ten factors to be considered in establishing an uncertainty factor. EPA's reference dose for acetochlor was developed considering only one of these items – inter and intra-species

variability. We have included two additional uncertainty factors of 10 each to account for the use of a subchronic study and to account for data gaps in the toxicological database. These factors are consistent with Chapter 160's directive to consider the quality and quantity of data relevant to establishing an acceptable daily intake level, but could also be justified under the directive to consider the importance to full health of the most sensitive target organs or body systems affected by the substance, or by the directive to consider potential interactions with other environmental chemicals. It should be noted that while federal risk assessments no longer utilize uncertainty factors above 3,000, EPA routinely applies a relative source contribution of 20% to chemicals in drinking water. When EPA combines an uncertainty factor of 3,000 with the 20% RSC to develop a drinking water health advisory, they are applying an overall safety factor of 15,000 which exceeds the uncertainty factor used in our Cycle 9 proposal. At this time, DHS is not proposing any changes in the proposed enforcement standards or preventive action limits for these metabolites.

2. WE Energies

WE Energies commented on the proposed ES for aluminum citing EPA Region 9's screening level of 37 mg/L for aluminum in tap water and the Agency for Toxic Substances and Disease Registry's (ATSDR) minimal risk level of 1 mg/kg/day for aluminum.

Response: We have not used these values in the development of a groundwater protection ES. It is our understanding that screening levels used by regional EPA offices are not official federal numbers as they are not published in the Federal Register or in IRIS and are not subjected to approval by EPA's central office or peer reviewed. ATSDR's minimal risk level of 1 mg/kg/day provides a guideline for total dietary and drinking water intake and was considered in our development of a safe level in groundwater, but was not used for our calculation since it was developed to consider ingestion from foods as well as water. The most useful federal guideline for drinking water identified in DHS' review was the US Food and Drug Administration's standard of 200 µg/L for commercially-sold bottled water. The World Health Organization has also established a standard of 200 µg/L for aluminum in drinking water.

We thank WE Energies for their comments and have amended the support document for aluminum to include information they have provided. The proposed ES has been rounded up from 170 to 200 µg/L to be consistent with the FDA and WHO guidelines for aluminum in drinking water.

3. US Department of Defense

The US DOD provided comments on the proposed standard for dinitrotoluene isomers. In its comments, the DOD argued that the toxicity database for minor isomers of DNT, as reviewed in our background document, does not support a combined standard and that analytical methods for DNT isomers cannot demonstrate compliance with the proposed standard. They recommended deferment of adoption of an ES until the US Army Public Health Command completes an assessment of the mutagenicity of DNT. The commenter cited two studies conducted by the Midwest Research Institute during the 1970s and supported by the US Army Medical Research and Development Command as primary studies that should have been included in our support document. While data from these studies have been published in secondary sources, the primary sources are available only from a DOD website. We were able to locate the December 8, 1978 progress report prepared by Ellis et al. which was referenced in the DOD comments and have added information from that report to our support document.

The commenter has provided the following technical comments:

The oral LD50 for 3,4 DNT should be 807 mg/kg, not 177 mg/kg.

Response: We appreciate this correction. Table 1 has been amended to list LD_{50}s in female rats as reported by Rickert et al. 1984. While these are not always the lowest LD_{50}s, the selection of a single species and single sex is intended to allow comparison of the toxicity of these isomers.

The underlying science does not support the development of a combined standard for DNT isomers.

Response: While data for the minor isomers is too limited for independent risk assessments, existing data indicates that they are similar in toxicity to the 2,4- and 2,6-isomers and that some effects of exposure are likely to be additive. On page 31 of their Dec 8, 1978 progress report submitted to the US Army, Ellis et al. concluded, "The acute oral toxicities of all the nitrotoluenes tested are generally similar... 3,5-DNT is the most toxic...All these (sic) nitrotoluenes were fairly well absorbed and widely distributed by rats. They were concentrated in the liver and kidneys...Ames tests of various munitions found that TNM, TNT, 2,4-DNT, 2,5-DNT and 1,2-DNG were potential mutagens active at 10 to 30 μg/plate. The other nitrotoluenes tested (2,3-DNT, 2,6-DNT, 3,4-DNT and 3,5-DNT) were weak mutagens." On page 28 of this report, the authors summarize the Ames tests results stating, "Many recent studies have shown that, in general, nitroaromatics exhibit a high degree of mutagenic activity in the Salmonella microsome plate test. . . In light of these considerations, it appears that TNT and the six DNT isomers should be considered as potentially mutagenic and possibly carcinogenic."

Our review of available literature on these isomers suggests that the chronic toxicities of DNT isomers are also likely similar although the toxicological databases are incomplete for the minor isomers. In the absence of a complete toxicological database for all six isomers, the most practical approach to ensure protection of public health is to regulate these chemicals, which have a common production source and are often found together in groundwater, as a group.

Purified 2,4-DNT and all of the minor isomers had no detectable initiating activity. The minor isomers had no detectable hepatocarcinogenic initiating activity.

Response: The literature is inconsistent regarding this issue. While Leonard et al. reported this finding, a 1979 report by Ellis et al. found that mice and rats fed a diet containing 98% pure 2,4-DNT had higher levels of liver (rats) and kidney (mice) tumors. In its review of these studies, the European Organization for Economic Cooperation and Development (OECD) provided the following, "The pure 2,4-DNT isomer induced the same tumor spectrum in long-term feeding studies in rats as was shown for the technical grade isomer mixture. Additionally, tumors of the renal tubular epithelium were observed in male mice after chronic 2,4-DNT feeding."

The minor isomers do not contribute to the carcinogenicity of Technical Grade DNT in an additive manner.

Response: We have been unable to locate any scientific studies that address the carcinogenic additivity of DNT isomers. While we do not have data from long-term feeding studies for the minor isomers, their structural similarity to the 2,4- and 2,6-isomers and their acute toxicity and mutagenicity profiles support an assumption of additivity.

DNT in groundwater cannot be accurately and reliably measured at levels proposed as standards and preventive action limits.

Response: Since analytical precision varies from lab to lab and tends to improve over time, it is not considered in our development of groundwater protection standards. According to Table 2 of the comments submitted by DOD which shows method quantitation limits (MQLs) and method detection limits (MDLs) for DNT isomers at the Badger Army Ammunition Facility in Baraboo, only 2,6- and 3,4-DNT have MQLs that exceed the proposed ES and all of the isomers have MDLs of <0.05 µg/L suggesting that laboratories can detect these substances if they exceed the proposed enforcement standard. While MDLs for some isomers exceed the proposed preventive action limit, detection of these substances would be considered an exceedance of this secondary standard.

4. Laura Olah, Executive Director, Citizens for Safe Water around Badger

DNR's proposal to regulate DNT in drinking water is vital to the community around Badger Army Ammunitions Plant and to millions of Wisconsin adults, children and infants who rely on groundwater as a source of drinking water.

Response: We appreciate the support of Ms. Olah and other members of this group for our efforts in ensuring the safety of Wisconsin's groundwater resource.

We support the proposed regulation of perchlorate and recommend that the proposed standard be revised from 7 µg/L to 1 µg/L – a level that is consistent with

recommendations from the NRDC, Environmental Working Group and many others. The proposed enforcement standard would put breast-fed infants, bottle-fed infants and young children at risk of having daily exposures that are near or even exceed the EPA reference dose considered to be a safe daily intake.

Response: Following review of additional materials submitted by this commenter, we have applied an additional uncertainty factor to ensure protection against long-term exposure to perchlorate, which has been detected in many foods as well as in surface and groundwater throughout the United States and is considered a possible human carcinogen.

5. Raymond Schmidt, Water Quality Specialist, Portage County Planning and Zoning Department

I am pleased to see that additional health-based standards are being proposed by pesticides and metabolites that are found in Wisconsin's groundwater. I encourage the state to develop methods for evaluating the health threats posed by mixtures of pesticides, metabolites and nitrate.

Response: We appreciate this comment. We encourage the use of hazard indices to assess the potability of water that contains more than one contaminant. While this approach does not address potential synergistic effects, it provides an additional measure of safety when multiple contaminants are detected and should be used to assess the need to replace severely contaminated water supplies.

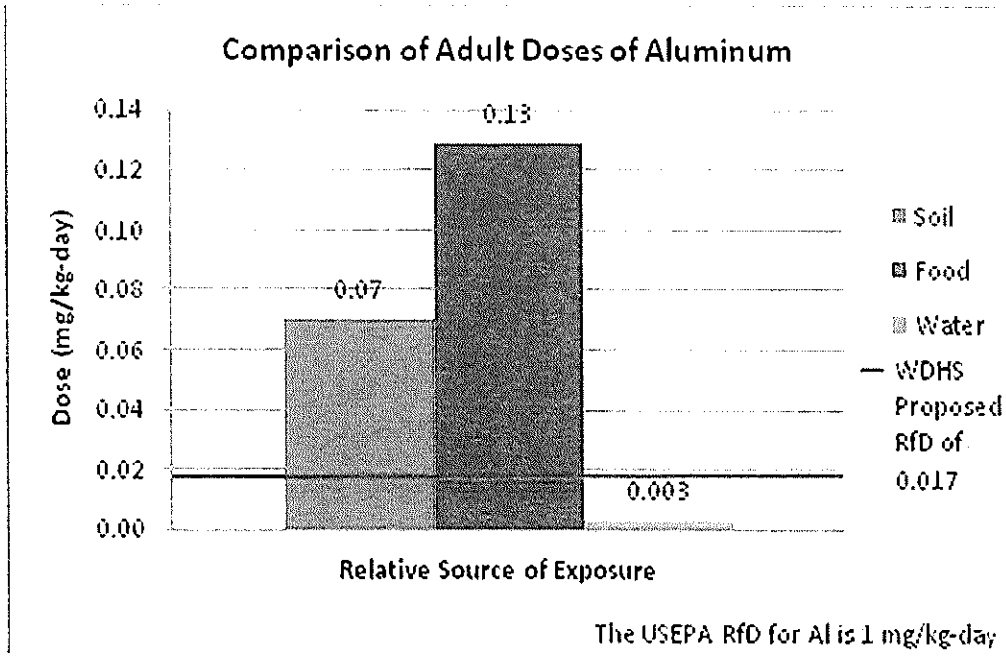
Summary of Concerns with WDHS ES/PAL for Aluminum

Prepared by: Lisa J.N. Bradley, Ph.D., DABT
and
Robert Paulson – We Energies

Attachment 4

Aluminum in the Natural Environment

- As the third most common element on Earth, aluminum (Al) is ubiquitous in the environment.
- It can be found in our food, water, and consumer products.
- The U.S. Geological Survey reports that background levels of Al in soils in Wisconsin range between 2 – 4.9% by weight, which is equivalent to 20,000 – 49,000 mg/kg.
- Naturally occurring Al levels in groundwater in Wisconsin generally range up to 0.1 mg/L (ATSDR, 2008). GRN data query produced results from No Detect to 334 mg/L.
- Based on standard regulatory assumptions (i.e. ,receptor's body weight, incidental soil ingestion rate, water ingestion rate, etc.), predicted exposure for an adult receptor based on incidental ingestion of Al through soil, dietary items, and water is as follows:
  - Exposure dose from soil: **0.03 to 0.07 mg/kg-d**
  - Exposure dose from food: **0.1 to 0.13 mg/kg-d**
  - Exposure dose from water: **0.0003 mg/kg-d**



Exposure to Al in water is a small and even negligible contribution to total exposure to Al in the natural environment.

Diet, however, contributes greatly to the amount of Al that we are exposed to on a daily basis. In fact, if the Al content of the laboratory diet is not considered and accounted for in bioassay studies, it must be assumed that the exposure levels have been underestimated (USEPA, 2006).

Availability of Toxicity Values for Aluminum

- **USEPA (IRIS)** – The IRIS database is a primary source of toxicity values. There are no toxicity values for Al on IRIS.
- **USEPA (PPRTV)**– USEPA has developed a Provisional Peer-Reviewed Toxicity Value (PPRTV) for Al of **1 mg/kg-day** (1 milligram of aluminum per kilogram of body weight per day), which is a daily level that is likely to be without an appreciable risk of deleterious effects during a lifetime of exposure. This value serves as the basis for the USEPA Regional Screening Level (RSL) for tap water of 37,000 ug/L. (LOAEL = 100 mg/kg-day; UF = 100)
- **ATSDR** – the Agency for Toxic Substances and Disease Registry (ATSDR) of the US Department of Health & Human Services has developed a Minimal Risk Level (MRL) for Al of **1 mg/kg-day**, which is a level that is an estimate of the daily human exposure to a substance that is likely to be without appreciable risk of adverse health effects. (LOAEL = 100 mg/kg-day; UF = 100)

Drinking Water Levels for Aluminum

- **USEPA Office of Water** - USEPA has not developed a health-based standard or Maximum Contaminant Level (MCL) for Al. However, it has published a secondary MCL (SMCL) of **200 ug/L**. The SMCL is not health based, but is designed to prevent unpleasant taste, odor, and unusual color. This SMCL is set at a level much lower than those that may be harmful to humans.
- **FDA** - The Food and Drug Administration (FDA) has a bottled water criterion of **200 ug/L** that is based on the USEPA SMCL. Thus, it too is based on prevention of unpleasant taste, odor, and unusual color, and is not based on human health effects.
- **WHO** – The World Health Organization (WHO) established a level of **200 ug/L** to address the use of Al containing compounds that remove solids from drinking water . The level was set based on practicality to achieve, and to minimize color or turbidity that may occur in the treated water at higher levels.
- **USEPA** – USEPA has a Regional Screening Level (RSL) table that provides health-based screening levels for several environmental media including tap water. The human health-based tap water RSL is **37,000 ug/L**.

WDHS Derived Draft Standard for Al

- **WDHS** – The Wisconsin Department of Health Services (WDHS) has proposed a toxicity value for Al of **0.017 mg/kg-day** for use in the development of NR 140 standards. This value is 59-fold lower than peer reviewed values developed independently by two federal agencies (ATSDR and EPA).
- The resulting draft enforcement standard (ES) for aluminum is 170 ug/L, rounded to **200 ug/L**. This level is similar to some other available drinking water levels, none of which are health-risk based.
- The WDHS-derived toxicity value is based on a single study yielding results not replicated by other studies or other species.
- The selection of the study did not consider several important factors:
  - The baseline Al content of the lab animal diet was not reported in the study
  - Only one treatment level was used rather than multiple treatment levels which are needed to develop a dose-response relationship
  - Only a small number of animals were used per treatment group (n=6)
  - The effects were reversed by the inclusion of Vitamin C in the treatment
- WDHS applied three levels of uncertainty factors, each at maximum levels, for a total uncertainty factor of 1,000.

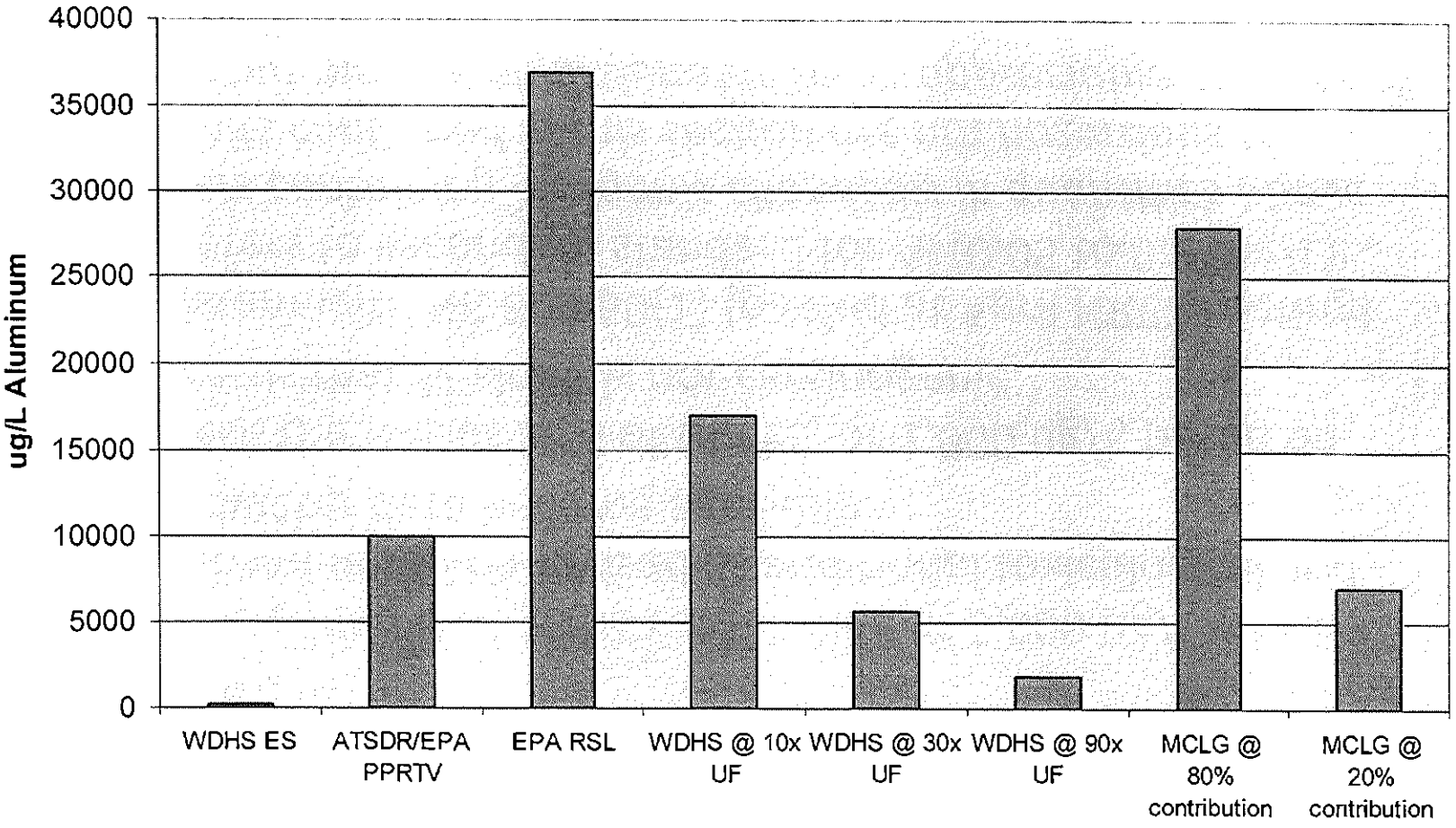
Summary

- In the context of peer-reviewed literature and in the context of the natural environment, the WDHS toxicity derivation for Al seems unrealistically low.
- Health-based reviews of Al from both US federal sources and from the literature have converged on the conclusion that Al has not been shown to be carcinogenic in animals and is not expected to be carcinogenic in humans.
- There is also consensus that due to the high background exposure to Al in the diet, studies that do not quantitatively account for Al exposure in the lab diet cannot be used quantitatively.
- The derivation is inconsistent with the requirements for ADI derivation set out in s. 160.13(2)(b)3.a-j. Specifically:
  - a. **The quality and quantity of data relevant to establishing an acceptable daily intake**
    - the study used is the only such study identified in the literature and, thus, the results have not been independently replicated
    - the study used did not account for the baseline Al content of the lab animal diet
    - Only six (6) animals were exposed
  - c. **The amount of interspecies and intraspecies variations** – WDHS has applied the maximum uncertainty factor for these potential variations (1,000), where those used by federal agencies are much lower (100) and applied to a higher point of departure (a LOAEL of 100 mg/kg-day).
  - d. **The dose-response curve** – WDHS has used a study that evaluated only 1 exposure level for aluminum, and there are no other similar studies in the literature, therefore, a dose-response relationship cannot be defined for aluminum for this endpoint.
  - f. **The potential interactions of the substance** – the study used by WDHS demonstrated that the effects observed in the Al treated animals was fully reversible by exposure to Vitamin C (ascorbic acid).

Alternatives

- Use EPA RSL
- Use ATSDR and EPA PPRTV RfD
- Use the WDHS study derivation, but apply realistic uncertainty factors
- Applying a MCLG derivation process using US EPA/ATSDR RfD
- Pull Al criteria from current NR 140 revision

Alternative Aluminum ES



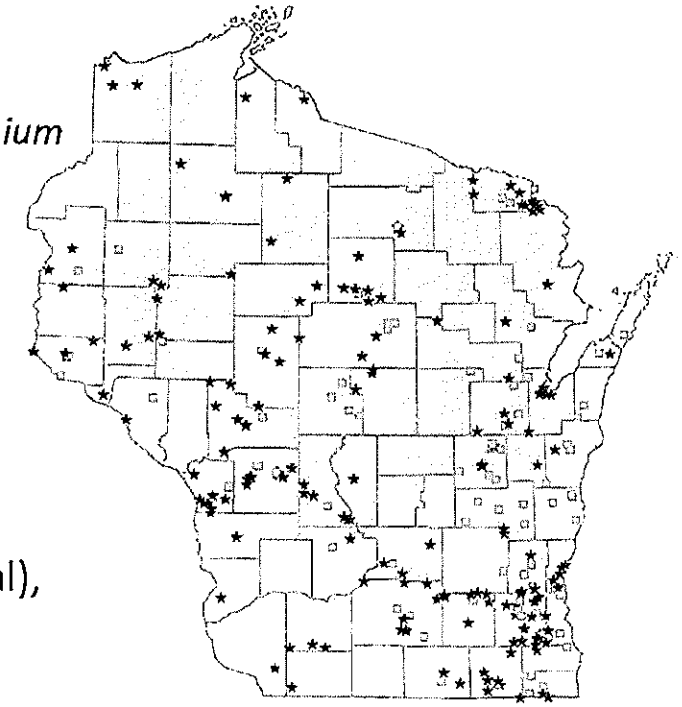
Path Forward

- Recommended that ES be established at 5,000 µg/L which can subsequently be revised as additional toxicological and groundwater data become available.
- Establish the PAL at 20% of the ES, or 1,000 ug/l, based on consensus that Al alone is not carcinogenic.
- Consistent with NR 809.60(1) (passed at April NRB meeting) that refers to secondary standard for Al (0.05 to 0.2 mg/L): *"Waters containing inorganic chemicals in quantities above the limits contained in this section are not hazardous to health but may be objectionable to an appreciable number of persons."*

10

Consequences of PAL Derivation

- PAL proposed at 10% of ES for carcinogenic substance consistent with NR 140.10.
- Other peer reviewed conclusions that also considered Schroder & Mitchener (1975) studies cited by WDHS:
  - ATSDR (2008) carcinogenicity evaluation states *"The available data do not indicate that aluminum is a potential carcinogen. It has not been shown to be carcinogenic in epidemiological studies in humans, nor in animal studies using inhalation, oral, and other exposure routes."*
  - Krewski et al. (2007), cited by WDHS, concluded: *"Overall, experimental animal studies have failed to demonstrate carcinogenicity attributable solely to aluminium compounds (for reviews, see ATSDR, 1999; .....)*
- GRN data query produced 199 potable wells and 313 non-potable wells that exceeded proposed PAL.
- When PAL for a carcinogenic substance is exceeded, NR 140.24 requires the Department to take action regardless of background concentration.
- Significant effort for well owners (private and municipal), the regulated community, and WDNR staff.



Attachment 5

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Governor

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Response to Comments from WE Energies

Prepared by Lynda Knobeloch, Ph.D.
Senior Toxicologist
Wisconsin Department of Health Services
May 25, 2010

The document prepared by Lisa Bradley, on behalf of WE Energies, focused on several key points including background aluminum levels in Wisconsin soil and water; human exposure from food and soil; a summary of available risk assessments and toxicity values; the carcinogenicity of aluminum; and the methods we have used to derive a groundwater enforcement standard and preventive action limit for aluminum.

1) Regarding background aluminum levels and human intake, Dr. Bradley provided the following summary:

> Aluminum levels in Wisconsin soil range between 2 and 4.9% by weight.
>
> Naturally-occurring aluminum in groundwater in Wisconsin generally ranges up to 0.1 mg/L.
>
> The average U.S. adult ingests approximately 7 to 9 mg aluminum per day in foods.
>
> A 15-kg child's exposure to aluminum from soil ranges from 0.27 to 0.65 mg/kg/day.
>
> Exposure to aluminum in water is a small and even negligible contribution to total exposure in the natural environment.

DHS agrees that most aluminum exposure is likely to come from foods. Antacids and buffered aspirin are other important sources for people who use these products. Naturally-occurring aluminum levels in Wisconsin's groundwater are quite low and are a minor source of exposure. This would not be the case, however, for someone whose water was contaminated with 5 mg or more aluminum per liter. Assuming daily ingestion of two liters of water per day by an adult, this water would likely be the primary source of exposure and would more than double total daily intake. It is important to realize that aluminum exists in hundreds of different chemical forms and that its bioavailability varies widely. Aluminum silicates found in soil pass through the gastrointestinal tract with very little absorption. Ligand-bound forms of aluminum present in many foods also have low absorption rates following ingestion. However, free aluminum ions from aluminum salts such as gluconates, citrates and lactates are more likely to be absorbed and pose a risk of accumulation and toxicity. We are concerned that dissolved forms of

aluminum that leach to groundwater may be more bioavailable than forms found in food and soil and could pose a greater exposure hazard.

2) Dr. Bradley cited several federal numbers as potentially useful in the development of a health-based groundwater standard. These include the US EPA Provisional Peer-Reviewed Toxicity Value (PPRTV) and ATSDR's Minimal Risk Level (MRL) for aluminum. Both of these values are set at 1 mg/kg/day for total aluminum intake. Dr. Bradley also mentioned a reference dose and drinking water equivalent level for aluminum. However, our review found that EPA has not developed either of these parameters.

The PPRTV and MRL for aluminum are not specific to exposure from water. DHS has concluded that these values cannot be used to develop a health-based groundwater protection standard without modification to consider the bioavailability and total intake from all sources. Although a reference dose and drinking water equivalent level are not available for aluminum, in their 2007 report to EPA, titled *Human Health Risk Assessment for Aluminium, Aluminium Oxide, and Aluminium Hydroxide*, Krewski et al. determined that the most sensitive endpoints were on reproductive and neurological function and concluded that a level of 100 ppb in drinking water was likely protective against these effects.

3) Dr. Bradley expressed concern that a single study was used to develop the groundwater enforcement standard for aluminum. While DHS conducted a comprehensive review of the toxicity literature for aluminum, the calculation of a numerical standard is traditionally based on a a NOEL or LOEL from a single study that is deemed scientifically valid and relevant to human health.

4) Regarding the carcinogenic potential of aluminum, Dr. Bradley pointed out that occupational studies of aluminum workers were confounded by concurrent exposure to other constituents that are more likely to be carcinogenic than aluminum. She went on to state that animal studies have failed to demonstrate a carcinogenic effect of aluminum.

DHS based the 10% PAL on the International Agency for Research on Cancer's classification of aluminum production as a known human carcinogen and on animal studies conducted by Schroeder and Mitchner which found a carcinogenic effect of aluminum in drinking water fed to rats and mice. While DHS recognizes that the IARC classification is for aluminum production and could be confounded by other workplace exposures, the peer-reviewed publications by Schroeder and Mitchner remain unchallenged. In 2002 Morton et al. also reported on the carcinogenicity of aluminum (Toxicol Pathol. 2002). These researchers found higher rates of preneoplastic and neoplastic renal lesions in Eker rats given IP injections of 2 mg Al per kg per day three times a week over a period of 4 to 6 months. Other recent studies have found genetic toxicity and epigenetic effects of aluminum suggesting the potential for aluminum to increase tumor development. While we believe there is a strong weight of evidence supporting use of a 10% preventive action limit, we recognize that a scientific case can also be made for a 20% preventive action limit. Therefore, DHS would support either a 10% or a 20% preventive action limit for aluminum.

5) WE Energies' comments included proposals to use a lower uncertainty factor to derive a groundwater standard. DHS opposes modification of the uncertainty factors which are standard to our risk assessment methods and necessary to ensure protection of vulnerable individuals.

6) Dr. Bradley recommended that Wisconsin's groundwater standard be set in the range between 5,000 and 35,000 µg/L. DHS does not support increasing the proposed enforcement

standard since there is no evidence that long-term consumption of aluminum-contaminated water is safe and considerable evidence to the contrary. An incident that occurred in Camelford England in which the drinking water supply was accidentally contaminated with aluminum at levels between 100 and 500 mg/L for several days is a case in point. Village residents experienced immediate symptoms of nausea, vomiting and diarrhea. A 10-year follow-up assessment of 55 exposed adults found evidence of long-term brain damage. A post-mortem examination of a Camelford resident who died after developing severe dementia at the age of 58, 15 years after the aluminum exposure, revealed a rare form of sporadic, early-onset β amyloid angiopathy in the cerebral cortex. High concentrations of aluminum were found in the affected regions of her brain (23 ug/g dry wt; normal 0-2 ug/g) suggesting that her illness and death were a direct result of her exposure to aluminum. Findings from this cohort suggest a long-term, delayed or progressive effect of acute aluminum intoxication on brain function.

7) DHS is also concerned regarding the bioavailability of aluminum in water. While aluminum silicates found in soil and ligand-bound forms found in some foods tend to pass through the gastrointestinal tract with little uptake into the blood stream, water soluble salts are more readily absorbed. Absorption is enhanced by low pH foods such as orange or grapefruit juice. Human uptake also varies depending on age, genetics, and health status.

DHS appreciates this opportunity to respond to the comments prepared by Dr. Bradley. However, we continue to support a groundwater enforcement standard of 200 µg/L and 10% or 20% preventive action limit for aluminum.

Attachment 6

State of Wisconsin

CORRESPONDENCE/MEMORANDUM

DATE: July 8, 2010

TO: Michael Lemcke – DG/5

FROM: Edward Lynch – WA/5

SUBJECT: Propose NR 140 Aluminum Standard

This memo was prepared following a conference call on June 3, 2010 between WE Energies representatives and representatives of the Wisconsin Departments of Health Services and Natural Resources. The DNR's Drinking and Groundwater program is proposing the establishment of groundwater standards for aluminum (Al) in Ch. NR 140, Wis. Admin. Code – Groundwater Quality. The proposed NR 140 enforcement standard (ES) for aluminum is 200 parts per billion (ppb) and the proposed preventive action level (PAL) is 20 ppb. This proposed rule was brought to the April 2010 Natural Resources Board (NRB).

At the April NRB meeting, WE Energies expressed concern regarding the potential effects the proposed Al standards would have on the DNR's Waste and Materials Management (WMM) program in the following areas:

- Ch. NR 507, Wis. Admin. Code – Environmental Monitoring for Landfills
- Ch. NR 538, Wis. Admin. Code – Beneficial Use of Industrial Byproducts

The WMM program initially requested the establishment of the Al standards as a result of high Al concentrations in groundwater resulting from alum sludge disposal at a few select industrial disposal sites. This was done to enable the DNR to require that landfill operators address high Al exceedances resulting from alum disposal. In one situation in northeastern Wisconsin, a private well located down-gradient of an alum landfill was reported to have discolored water which led to sampling. DNR staff sampling revealed concentrations of 1,100 and 1,920 ug/l (ppb). At another alum disposal site in central Wisconsin, Al concentrations have been in the 40,000 to 60,000 ppb range and have been as high as 155,000 ppb as recently as October, 2009.

Relationship between ch. NR 140, Wis. Admin. Code and monitoring at landfills. Ch. NR 507, Wis. Admin. Code (Environmental Monitoring for Landfills) identifies parameters to be monitored in groundwater at municipal solid waste landfills and landfills accepting waste other than municipal solid waste (i.e., paper mill sludge, fly or bottom ash, foundry waste, etc). Al monitoring is not a requirement in any of the tables in the appendices to Ch. NR 507, Wis. Admin. Code. At this time, the WMM program does not plan to amend Ch. NR 507, Wis. Admin. Code to add Al. When necessary, such as in the case of landfills accepting alum sludge for disposal, the WMM program can require Al monitoring through the initial approval or subsequent plan modification to a landfill's monitoring plan.

The WMM program does not plan to modify plan approvals for utility landfills to require Al monitoring of the groundwater unless there is some evidence that Al be could elevated or potentially causing a groundwater problem. There are two reasons WMM does not plan to add Al. First, other parameters such as alkalinity, boron, sulfate, conductivity, pH, and hardness provide adequate monitoring for landfills managing ash. This parameter list can be updated on a case by case basis as was done with molybdenum at a few ash sites. Second, the WMM has data from Al in groundwater collected in the vicinity of a utility landfill in southeast Wisconsin. Of the 40 test results from adjacent wells, the highest

concentration of Al was 25 ug/l (ppb) and Al was not detected in 19 (about 1/2) of them. In other words, investigations at former landfill sites are driven by parameters other than Al.

The WMM program does not believe it is necessary to adopt for groundwater monitoring at landfills for all the parameters set forth in ch. NR 140, Wis. Admin. Code. Of the 131 substances currently in ch. NR 140, Wis. Admin. Code, ch. NR 507, Wis. Admin. Code identifies only a very small subset to be included as part of a landfill detection monitoring program. When necessary, WMM has the authority to add parameters at a particular site as part of a plan modification. S. NR 507.18 Wis. Admin. Code covers baseline groundwater quality sampling and s. NR 507.18(1) Wis. Admin. Code allows the department to require additional parameters based on the waste types and waste characteristics accepted at the landfill. S. NR 507.19 Wis. Admin. Code covers detection groundwater monitoring which requires owners or operators of solid waste landfills to implement a detection groundwater monitoring program in accordance with their approved plan of operation. In EPA's proposed rule on management of coal combustion residuals, EPA is not proposing Al monitoring of their baseline groundwater monitoring program under their subtitle D proposal (information the EPA proposal follows).

Ch. NR 140, Wis. Admin. Code and beneficial use of industrial byproducts. Ch. NR 538, Wis. Admin. Code – Beneficial use of industrial byproducts. DNR promulgated NR 538, Wis. Admin Code in 1998 "*...to allow and encourage to the maximum extent possible, consistent with the protection of public health and the environment and good engineering practices, the beneficial use of industrial byproducts in a nuisance-free manner. The department encourages the beneficial use of industrial byproducts in order to preserve resources, conserve energy, and reduce or eliminate the need to dispose of industrial byproducts in landfills*". WE Energies has been in the forefront in finding and developing markets for coal combustion byproducts. These efforts have led to utilization of large volumes of their coal combustion byproducts which in turn has saved landfill space and reduced disposal costs. Coal combustion byproducts (bottom ash, fly ash and flue gas desulfurization ash) take the place of virgin materials in products such as cement manufacturing, drywall manufacturing, brick manufacturing and in WE's Gypsoil soil amendment and are also used as geo-technical fill and as concrete aggregate replacement materials. The WMM program would like to see these beneficial use efforts continue.

WMM only uses Al as a value in Appendix 1 to identify category 1 byproducts. In NR 538, Wis. Admin. Code, Appendix 1, Table 1A, the Al standard is 1.5 mg/l (ppm) Al using ASTM water leach test (for coal ash). This Al standard has been in existence since the rule was promulgated in 1998 and does not seem to have limited WE Energies coal byproduct utilization as they have successfully developed beneficial uses for coal ash byproducts. Byproducts from sources other than those listed in Appendix 1, Table 2 (which includes coal ash) do not monitor for Al unless directed by the department. We have not required Al monitoring for coal ash byproducts beyond what is required in the code nor is it our intention to modify those requirements without going through the code revision process.

S. NR 538.10 (1) Wis. Admin. Code allows for the beneficial uses of industrial byproducts as raw materials for manufacturing of a product in which the measurable leaching, emissions or decomposition characteristics of the industrial byproduct are substantially eliminated. These include cement, lightweight aggregate, concrete, and wallboard. We Energies manages a significant amount of its ash byproduct via manufacturing of these products. WMM encourages the continuation of this practice and we have no plans to limit this use due to Al content of the byproducts.

WE Energies bottom ash is typically Category 2 material and the fly ash is typically Category 4. Category 1 materials have the fewest use restrictions and most flexibility in use. Beneficial uses of industrial byproducts include use as raw materials, as supplemental fuels providing energy through

controlled burning, daily cover or internal structures at landfills, confined or unconfined geotechnical fill material such as transportation embankments or side walls, as un-bonded or bonded surface course material, or as winter weather road abrasive. Category 1 materials are the only industrial byproducts that can be placed below the water table or in standing water.

As a point of clarification, at the April NRB meeting, I indicated there are separation distances between ground water and industrial byproducts such coal ash material when used in road construction. This is true for the use of category 2 and higher byproducts which I assumed we were talking about during our discussion since the Al standard has been around for over 10 years already and not posed a problem.

Other than for Category 1 identification, WMM has no other Al standards in ch. NR 538, Wis. Admin. Code and has no plans to add Al to any of the other category designations. WMM does not see a need for further monitoring of Al in coal ash. In the future, when WMM has time and resources to revise NR 538, Wis. Admin. Code, we would plan to have a technical advisory committee and would invite utility participation.

Proposed Federal Legislation concerning coal combustion byproducts. An important caveat concerning the management of coal combustion byproducts is the recently proposed federal rules for management of these materials. These proposed rules may have a significant effect on management of coal combustion byproducts. These first ever federal rules on coal combustion byproducts include language that could result in coal combustion byproducts being regulated under subtitle C (typically hazardous waste) of the federal Resource Conservation and Recovery Act (RCRA) or subtitle D (typically solid waste) of RCRA. EPA is proposing these rules to ensure the safe management of combustion coal residuals that are disposed in surface impoundments and landfills as well as when beneficially used. EPA believes that additional coal ash specific federal regulations are necessary to protect human health and the environment. This is the first time national rules have been issued specifically to manage coal ash disposal. In their subtitle D proposal, EPA does not include Al monitoring as part of the initial site detection monitoring program. The EPA rule proposal includes Al only in the assessment monitoring program when a statistically significant increase over background is detected.

On May 4, 2010, EPA released their pre-publication version of this rule and amended it on May 18, to make corrections. On June 21, 2010, EPA published the proposed rules in the Federal Register to officially begin the federal comment period. DNR plans comment on this federal proposal.

Please let me know if you have questions.

Cc: Ann Coakley – WA/5
Kate Cooper & Jack Connely – WA/5
Phil Fauble – WA/5

Attachment 7

Summary of Metal Test Results, 2007-2009

	Health Advisory	Max	Mean	No. High	No. Tests
	ug/L	ug/l	ug/L		
AL	170	2,210	19.13	32	3,560
AS	10	1,929	8.06	153	3,560
CA	N/A	1,965	51.78	NA	3,560
CD	5	1,947	6.22	24	3,560
CO	40	1,280	1.62	0	3,554
CR	100	17	0.44	0	3,554
CU	1300	8,600	45.20	16	3,554
FE	300	66	0.48	731	3,532
MG	NA	2,975	32.23	NA	3,532
MN	300	3,540	56.87	141	3,531
NI	100	2,790	3.73	18	3,531
PB	15	803	1.91	61	3,532
SR	4,000	32,500	365.26	3	354
V	30	114	1.25	18	3,531
ZN	5,000	6,720	92.44	5	3,531

Wisconsin Department of Administration
Division of Executive Budget and Finance
DOA-2048 (R10/2000)

Fiscal Estimate — 2009 Session

☒ Original	☐ Updated	LRB Number	Amendment Number if Applicable
☐ Corrected	☐ Supplemental	Bill Number	Administrative Rule Number DG-24-09

Subject

Amendments to ch. NR 140, Wis. Adm. Code (Groundwater Quality)

Fiscal Effect

State: ☒ No State Fiscal Effect
☐ Indeterminate

Check columns below only if bill makes a direct appropriation or affects a sum sufficient appropriation.

☐ Increase Existing Appropriation ☐ Increase Existing Revenues
☐ Decrease Existing Appropriation ☐ Decrease Existing Revenues
☐ Create New Appropriation

☐ Increase Costs — May be possible to absorb within agency's budget.
☐ Yes ☐ No

☐ Decrease Costs

Local: ☒ No Local Government Costs
☐ Indeterminate

1. ☐ Increase Costs ☐ Permissive ☐ Mandatory
2. ☐ Decrease Costs ☐ Permissive ☐ Mandatory
3. ☐ Increase Revenues ☐ Permissive ☐ Mandatory
4. ☐ Decrease Revenues ☐ Permissive ☐ Mandatory
5. Types of Local Governmental Units Affected:
☐ Towns ☐ Villages ☐ Cities
☐ Counties ☐ Others _____
☐ School Districts ☐ WTCS Districts

Fund Sources Affected

☐ GPR ☐ FED ☐ PRO ☐ PRS ☐ SEG ☐ SEG-S

Affected Chapter 20 Appropriations

Assumptions Used in Arriving at Fiscal Estimate

SUMMARY OF RULE - Chapter NR 140, Wis. Adm. Code, establishes Wisconsin state groundwater quality standards and creates a framework for implementing those standards in compliance with Wis. Stat. Ch. 160. These proposed amendments to NR 140 add a new enforcement standard (ES) and preventive action limit (PAL) for 15 substances, and revise existing ESs and PALs for an additional 15 substances. In accordance with Wis. Stat. Ch. 160, these proposed amendments to NR 140 groundwater quality standards are based on recommendations from the Wisconsin Department of Health Services.

Chapter NR 140 currently contains groundwater standards for 123 substances of public health concern, 8 substances of public welfare concern and 15 indicator parameters. The proposed new and revised standards would apply to all regulated facilities, practices and activities which may impact groundwater quality. Regulated facilities, practices and activities, which are sources of the substances for which groundwater standards are proposed, are, for the most part, likely sources of substances for which groundwater standards already exist. Consequently, there should be few cases where the proposed standards would be exceeded where existing standards are not currently being exceeded. Thus, the Department does not anticipate significant additional costs to the regulated community associated with these new and revised NR 140 standards. Also, any additional monitoring costs to the regulated community should be minimal, and the workload of state regulatory agencies should not change substantially.

FISCAL IMPACT - Although additional monitoring costs may be imposed upon the state or local government entities that are within the regulated community, the extent of such monitoring and any costs associated with it--while too speculative to quantify at this time--are not expected to be significant. Further, any increased monitoring costs associated with the setting of an ES and PAL for new substances and the lowering of the existing ES and PAL for other substances may be offset by cost savings associated with the relaxing of ESs and PALs for other compounds. Thus, on balance, the Department believes it is unlikely that there will be additional costs to state and local governments resulting from adopting these groundwater standards.

Long-Range Fiscal Implications

Prepared By:	Telephone No.	Agency
Joe Polasek	266-2794	Department of Natural Resources
Authorized Signature	Telephone No.	Date (mm/dd/ccyy)
	266-2794	03-10-10

Wisconsin Department of Administration
Division of Executive Budget and Finance
DOA-2048 (R10/2000)

Fiscal Estimate — 2009 Session

Page 2 Assumptions Narrative Continued

LRB Number	Amendment Number If Applicable
Bill Number	Administrative Rule Number DG-24-09

Assumptions Used in Arriving at Fiscal Estimate – Continued

Wisconsin Department of Administration
Division of Executive Budget and Finance
DOA-2047 (R10/2000)

Fiscal Estimate Worksheet — 2009 Session

Detailed Estimate of Annual Fiscal Effect

☒ Original ☐ Updated	LRB Number	Amendment Number if Applicable
☐ Corrected ☐ Supplemental	Bill Number	Administrative Rule Number DG-24-09

Subject

Amendments to ch. NR 140, Wis. Adm. Code (Groundwater Quality)

One-time Costs or Revenue Impacts for State and/or Local Government (do not include in annualized fiscal effect):

None

Annualized Costs:	Annualized Fiscal Impact on State Funds from: Increased Costs	Decreased Costs
A. State Costs by Category		
State Operations — Salaries and Fringes	$	$ -
(FTE Position Changes)	(FTE)	(- FTE)
State Operations — Other Costs		-
Local Assistance		-
Aids to Individuals or Organizations		-
Total State Costs by Category	$	$ -
B. State Costs by Source of Funds	Increased Costs	Decreased Costs
GPR	$	$ -
FED		-
PRO/PRS		-
SEG/SEG-S		-
State Revenues — Complete this only when proposal will increase or decrease state revenues (e.g., tax increase, decrease in license fee, etc.)	Increased Revenue	Decreased Revenue
GPR Taxes	$	$ -
GPR Earned		-
FED		-
PRO/PRS		-
SEG/SEG-S		-
Total State Revenues	$	$ -

Net Annualized Fiscal Impact

	State	Local
Net Change in Costs	$	$
Net Change in Revenues	$	$

Prepared By:	Telephone No.	Agency
Joe Polasek	266-2794	Department of Natural Resources
Authorized Signature	Telephone No.	Date (mm/dd/ccyy)
Joe Polasek	266-2794	03-10-10

ORDER OF THE STATE OF WISCONSIN
NATURAL RESOURCES BOARD
AMENDING RULES

The Wisconsin Natural Resources Board proposes an order to amend s. NR 140.10 Table 1 and Appendix 1, relating to groundwater quality standards

DG-24-09

Analysis Prepared by the Department of Natural Resources

1. Statutes interpreted: In promulgating this rule, ss. 281.12(1), 281.15, 281.19(1) and 299.11, Stats., and ch. 160, Stats., have been interpreted as authorizing the department to modify and create rules relating to development of numerical groundwater quality standards.

2. Statutory authority: Sections 281.12(1), 281.15, 281.19(1) and 299.11, Stats., and ch. 160, Stats.

3. Explanation of agency authority to promulgate the proposed rules under the statutory authority: Section 281.12(1), Stats., grants the Department the authority to carry out planning, management and regulatory programs necessary to protect, maintain and improve the quality and management of the waters of the state, ground and surface, public and private. Section 281.15, Stats., states that the Department shall promulgate rules setting standards of water quality, applicable to the waters of the state, that protect the public interest, including the protection of public health and welfare, and the present and prospective future use of such waters for public and private water systems. Section 281.19(1), Stats., grants the Department the authority to issue general orders and adopt rules applicable throughout the state for the construction, installation, use and operation of practicable and available systems, methods and means for preventing and abating pollution of the waters of the state.

Chapter 160, Stats., establishes an administrative process for developing numerical state groundwater quality standards to be used as criteria for the protection of public health and welfare by all state groundwater regulatory programs. Chapter 160, Stats., directs the Department to use this administrative process to establish numeric groundwater quality standards for substances of public health or welfare concern, found in, or having a reasonable probability of being detected in, the groundwater resources of the state.

In accordance with ch. 160, Stats., the reliability of sampling data is to be considered when determining the range of responses that a regulatory agency may take, or require, to address attainment or exceedance of a state groundwater quality standard at an applicable "point of standards application". Section 299.11, Stats., authorizes the Department, in conjunction with the Department of Agriculture Trade and Consumer protection, to establish uniform minimum criteria for laboratories certified to conduct water analysis testing, and to establish accepted methodologies to be followed in conducting tests and sampling protocols and documentation procedures to be followed when collecting water samples for testing.

4. Related statute or rule: Chapter 280, Stats., authorizes the Department to prescribe, publish and enforce minimum standards and rules to be pursued in the obtaining of pure drinking water for human consumption. Chapter NR 809, Wis. Adm. Code, establishes minimum state drinking water standards for the protection of public health, safety and welfare. This administrative code contains numeric water quality protection standards applicable to public water supply systems in Wisconsin. Wisconsin state

drinking water standards, applicable to public drinking water systems, have not yet been established for: 1,4-Dioxane, Acetochlor, Acetochlor ethane sulfonic acid (ESA) + oxanilic acid (OXA), Ammonia (as N), Chlorodifluoromethane, Chlorpyrifos, Dimethenamid/Dimethenamid-P, Dinitrotoluene Total Residues, Ethyl Ether, Metolachlor ethane sulfonic acid (ESA) + oxanilic acid (OXA), Perchlorate, Propazine or Tertiary Butyl Alcohol. Secondary Standards, established for aesthetic quality, have been promulgated in s. NR 809.60, Wis. Adm. Code, for Aluminum and Manganese. These ch. NR 809 Secondary Standards are 50 to 200 parts per billion (ppb) for aluminum, and 50 ppb for manganese. Note, units are parts per billion (ppb), 1 ppb is equivalent to 1 microgram per liter (ug/L).

5. Plain language analysis of the proposed rule: Chapter 160, Stats., requires the Department to develop numerical groundwater quality standards, consisting of enforcement standards and preventive action limits. Chapter NR 140, Wis. Adm. Code, establishes groundwater standards and creates a framework for implementation of the standards by the Department. These proposed amendments to ch. NR 140 would add new state groundwater quality standards for 15 substances and revise existing standards for another 15 substances. In accordance with ch. 160, Stats., amendments to ch. NR 140 groundwater quality standards are based on recommendations from the Department of Health Services.

New public health related groundwater quality standards are proposed for: 1,4-Dioxane, Acetochlor, Acetochlor - ESA + OXA, Aluminum, Ammonia, Chlorodifluoromethane, Chlorpyrifos, Dimethenamid/Dimethenamid-P, Dinitrotoluenes, Ethyl Ether, Manganese, Metolachlor - ESA + OXA, Perchlorate, Propazine and Tertiary Butyl Alcohol.

Revised public health related groundwater quality standards are proposed for: 1,3-Dichlorobenzene, 1,3-Dichloropropene, Acetone, Boron, Carbaryl, Chloromethane, Dibutyl Phthalate, Ethylene Glycol, Methyl Ethyl Ketone, Metolachlor, Metribuzin, Phenol, Prometon, Toluene and Xylene.

Minor revisions, to clarify rule language and update rule reference information, are also proposed to ch. NR 140. These revisions include:

- Replacing current "Chromium" in ch. NR 140 Table 1 with "Chromium (total)" to clarify that ch. NR 140 standards apply to total chromium (combination of chromium III and chromium VI).
- Replacing current "Cyanide" term in ch. NR 140 Table 1 with "Cyanide, free" to clarify that ch. NR 140 standards apply to "free cyanide" (HCN, CN^- and metal-cyanide complexes that are easily dissociated into free cyanide ions). Footnote added to Table 1 stating that "Cyanide, free" refers to the simple cyanides (HCN, CN^-) and /or readily dissociable metal-cyanide complexes, and that free cyanide is regulatorily equivalent to cyanide quantified by approved analytical methods for "amenable cyanide" or "available cyanide".
- Changing "Metolachlor" in ch. NR 140 Table 1 to "Metolachlor/s-Metolachlor" to clarify that ch. NR 140 standards apply to both Metolachlor (CAS RN 51218-45-2) and its stereo isomer, s-Metolachlor (CAS RN 87392-12-9).
- Revising units for field specific conductance in s. NR 140.20 Table 3 from micromhos/cm (micromhos per centimeter) to microSiemens/cm (microSiemens per centimeter or µS/cm).
- Revising s. NR 140.28(5)(c)6 note to add "for discharges, as defined by s. 283.01(4), Stats" language related to the need for a wastewater discharge permit.
- Adding CAS RN of 142363-53-9 for Alachlor-ESA to Appendix I to Table 1.
- Changing existing Appendix I to Table 1 CAS RN for Asbestos from 12001-29-5 (chrysotile asbestos) to 1332-21-4 (asbestos, all forms).
- Adding "Chromium (total)", with CAS RN of 7440-47-3, to ch. NR 140 Appendix I to table 1.
- Adding CAS RN of 542-75-6 for cis/trans 1,3 Dichloropropene (mixed isomers) to ch. NR 140 Appendix I to Table 1.
- Changing existing Appendix I to Table 1 CAS RN for Fluoride from 16984-48-8 to 7681-49-4.

- Adding 1,1,1,2-PCA synonym for 1,1,1,2 tetrachloroethane to ch. NR 140 Appendix I to table 1.
- Adding 1,1,2,2-PCA synonym for 1,1,2,2 tetrachloroethane to ch. NR 140 Appendix I to table 1.
- Adding 1,1,1-TCA synonym for 1,1,1 trichloroethane to ch. NR 140 Appendix I to table 1.

6. Summary of and preliminary comparison with any existing or proposed federal regulation: The United States Environmental Protection Agency (US EPA) establishes health based drinking water maximum contaminant levels (MCLs), cancer risk levels and health advisories (HAs). Federal drinking water MCLs are established based on scientific risk assessments and, in some cases, economic and technological considerations. Cancer risk levels are established as the concentration of a chemical in drinking water that corresponds to a specific excess estimated lifetime cancer risk. Federal lifetime health advisories (LHAs) are developed based on an established health risk acceptable daily intake (ADI) level or reference dose (RfD). An ADI or RfD is the daily oral exposure to a chemical that is likely to be without an appreciable risk over a lifetime.

No federal drinking water MCLs have yet been established for any of the substances for which new Wisconsin state groundwater quality standards are proposed. Federal 1 in 1,000,000 drinking water cancer risk levels have been established at 3 ppb for 1,4-Dioxane and at 0.05 ppb for DNT (mixture of 2,4-/2,6-DNT). US EPA LHAs have been established at 2 ppb for Chlorpyrifos, at 300 ppb for Manganese and at 10 ppb for Propazine. The US EPA has also developed an "Interim Drinking Water Health Advisory" of 15 ppb for Perchlorate. RfDs have been established by EPA for: Dimethenamid at 0.05 mg/kg-day, Ethyl Ether at 0.2 mg/kg-day and Perchlorate at 0.0007 mg/kg-day. A Reference Concentration (RfC) for Chronic Inhalation Exposure of 50 mg/m^3 has been established by EPA for Chlorodifluoromethane.

US EPA Contaminant Candidate List (CCL): The Contaminant Candidate List (CCL) is the US EPA's list of unregulated contaminants which may require national drinking water regulation in the future. The current list is designated Contaminant Candidate List 3 (CCL 3). Substances on EPA's CCL 3 include: 1,4-Dioxane, Acetochlor, Acetochlor ethansulfonic acid (Acetochlor-ESA), Acetochlor oxanillic acid (Acetochlor-OXA), HCFC-22 (Chlorodifluoromethane), Metolachlor ethansulfonic acid (Metolachlor-ESA), Metolachlor oxanillic acid (Metolachlor-OXA), and Perchlorate.

7. Comparison of similar rules in adjacent states (Minnesota, Iowa, Illinois and Michigan): The proposed amendments to ch. NR 140, Wis. Adm. Code, would add new state numeric groundwater quality standards for 15 substances: 1,4-Dioxane, Acetochlor, Acetochlor ESA + OXA, Aluminum, Ammonia (as N), Chlorodifluoromethane, Chlorpyrifos, Dimethenamid/Dimethenamid-P, Dinitrotoluenes (Total Residues), Ethyl Ether, Manganese, Metolachlor ESA + OXA, Perchlorate, Propazine and Tertiary Butyl Alcohol. The groundwater quality standards contained in ch. NR 140 are used in Wisconsin by state regulatory agencies as state groundwater protection standards. These standards are used as contamination site cleanup levels, design and management criteria for regulated activities and as minimum public health and welfare protection standards for contaminants in groundwater.

The states surrounding Wisconsin: Minnesota, Michigan, Illinois and Iowa, also use groundwater protection values/levels/standards in their regulation of practices and activities that might impact the quality of groundwater resources. Three of the states surrounding Wisconsin have promulgated individual state groundwater protection standards and one utilizes established federal standards (federal drinking water maximum contaminant levels, lifetime health advisory levels and established cancer risk levels) as their state groundwater protection standards.

Groundwater protection quality values/levels/standards are usually developed based on health risk assessments. States are often required to follow state specific health risk assessment methodology when

establishing groundwater protection quality standards. States may use state specific health risk assessments; factors and methodology in calculating and developing their groundwater protection standards. This use of different health risk assessment factors and methodologies has lead to the establishment of different state groundwater protection values/levels/standards for the same substance. For example, the health based groundwater protection quality standard for manganese used by the states surrounding Wisconsin varies by state - the standard used in Minnesota is 300 ppb, the standard used in Michigan is 860 ppb, Illinois uses 150 ppb and the standard used in Iowa is 300 ppb, the federal Lifetime Health Advisory level.

The state of Minnesota has established state groundwater protection "Health Risk Limits" (HRLs) under Minnesota Statutes Section 103H.201. The State of Minnesota has established HRLs for Acetochlor at 9 ppb and for Ethyl Ether at 1,000 ppb. The Minnesota Department of Health has also calculated "Health Based Values" (HBVs) for some groundwater contaminants. Minnesota HBVs are not standards that have been promulgated by rule but are calculated concentrations that may be used as advisory levels by Minnesota state groundwater and environmental protection programs. The State of Minnesota has established HBVs for: Metolachlor-ESA at 800 ppb, Metolachlor-OXA at 800 ppb, Acetochlor-ESA at 300 ppb and Acetochlor-OXA at 100 ppb. The Minnesota Department of Health also issues Risk Assessment Advice (RAA) levels for some groundwater contaminants. Minnesota Department of Health RAAs are advisory concentrations developed to assist Minnesota agencies in evaluating potential health risks to humans from exposures to a chemical. Generally, RAAs contain greater uncertainty than HRLs and HBVs because the information available to develop them is more limited. The State of Minnesota has established a RAA for Manganese at 300 ppb.

The state of Michigan has established state groundwater protection quality standards. Michigan "Drinking Water Criteria and Risk Based Screening Levels (RBSLs)" are Michigan state groundwater protection standards authorized in accordance with Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451 (NREPA). The State of Michigan has established a Drinking Water Criteria/RBSL for: 1,4-Dioxane at 85 ppb, Manganese at 860 ppb, Aluminum at 300 ppb, Propazine at 200 ppb, Chlorpyrifos at 22 ppb, Ethyl Ether at 3,700 ppb and Tertiary Butyl Alcohol at 3,900 ppb. The State of Michigan also has established a Drinking Water Criteria/RBSL for "all potential sources of nitrate-nitrogen", including ammonia nitrogen, in groundwater drinking water supplies at 10,000 ppb.

The state of Illinois has established state groundwater quality standards for "potable resource groundwater". Illinois Groundwater Quality Standards are state groundwater protection standards promulgated in 35 Ill. Adm. Code 620, environmental protection regulations. Illinois state "Groundwater Quality Standards for Class I: Potable Resource Groundwater" have been established for Manganese at 150 ppb. The state of Illinois also has established "Groundwater Cleanup Objectives" in 8 Ill. Adm. Code 259. Illinois Groundwater Cleanup Objectives include both Illinois state Groundwater Quality Standards and Human Threshold Toxicant Advisory Concentrations (HTTACs). Illinois has established state Groundwater Cleanup Objectives for Class I, Potable Resource Groundwater: at 21 ppb for Chlorpyrifos, at 2 ppb for Acetochlor and at 10,000 ppb for Ammonia. The Illinois Acetochlor groundwater cleanup objective value was established in accordance with the Acetochlor Registration Agreement monitoring program. The state groundwater cleanup objective for Ammonia was developed based on the US EPA's 30,000 ppb Lifetime Health Advisory level for ammonia in drinking water.

The state of Iowa has not established specific state groundwater protection standards. In accordance with Iowa Environmental Protection Regulations 567 IAC Chapter 133, Iowa uses established federal EPA lifetime health advisory levels, "negligible risk levels" (NRLs) for carcinogens, the estimate of one additional cancer case per million people over a lifetime of exposure, and federal drinking water maximum contaminant levels (MCLs) as "Action Levels" in their regulation of practices and activities that may adversely impact groundwater quality. As noted in section 6 above, federal lifetime health

advisory levels have been established at 2 ppb for Chlorpyrifos, at 300 ppb for Manganese and at 10 ppb for Propazine. Federal 1 in 1,000,000 drinking water cancer risk levels have been established at 3 ppb for 1,4-Dioxane and at 0.05 ppb for DNT (mixture of 2,4-/2,6-DNT).

8. Summary of the factual data and analytical methodologies that the agency used in support of the proposed rule and how any related findings support the regulatory approach chosen for the proposed rule: In accordance with s. 160. 07, Stats., the Department is required, for substances of public health concern, to propose rules establishing recommendations from the Department of Health Services (DHS) as state groundwater quality enforcement standards. In accordance with s. 160.15, Stats., the Department is required to establish by rule a preventive action limit for each substance for which an enforcement standard is established.

The DHS has provided the Department, in a document titled *Scientific Support Documentation for Cycle 9 Revisions of NR 140.10 Groundwater Enforcement Standard & Preventive Action Limit Recommendations* (Revised February 2010), its recommendations for new state public health related groundwater quality standards for 15 substances: 1,4-Dioxane, Acetochlor, Acetochlor ESA + OXA, Aluminum, Ammonia (as N), Chlorodifluoromethane, Chlorpyrifos, Dimethenamid/Dimethenamid-P, Dinitrotoluenes, Ethyl Ether, Manganese, Metolachlor ESA + OXA, Perchlorate, Propazine and Tertiary Butyl Alcohol. DHS has also provided recommendations for revisions to existing public health related state groundwater quality standards for 15 additional substances: 1,3-Dichlorobenzene, 1,3-Dichloropropene, Acetone, Boron, Carbaryl, Chloromethane, Dibutyl Phthalate, Ethylene Glycol, Methyl Ethyl Ketone, Metolachlor, Metribuzin, Phenol, Prometon, Toluene and Xylene.

The Department is proposing rules establishing the DHS enforcement standard recommendations as ch. NR 140, Wis. Adm. Code, state groundwater quality enforcement standards. The Department is also proposing rules establishing ch. NR 140, Wis. Adm. Code, state groundwater quality preventive action limits in accordance with s. 160.15(1), Stats.

9. Any analysis and supporting documentation that the agency used in support of the agency's determination of the rule's effect on small business under s. 227.114, Stats., or that was used when the agency prepared an economic impact report: In its determination of the effect of this proposed rule on small businesses, the Department used analysis and supporting documentation that included information from the United States Department of Agriculture - National Agricultural Statistics Service (NASS), the University of Wisconsin (UW) - Department of Agronomy and the Wisconsin Department of Agriculture Trade and Consumer Protection (DATCP). Information used from the United States Department of Agriculture NASS included agricultural chemical usage reports from 2001 - 2007, and the NASS Agricultural Chemical Use Database. Information used from the UW Department of Agronomy included the UW Extension 2008 Herbicide price list and the UW Extension Corn and Soybean Herbicide Chart. Information from DATCP included data from DATCP's *Agricultural Chemicals in Wisconsin Groundwater - Final Report March 2008* document and results from the agency's groundwater monitoring and pesticide registration databases.

10. Effects on small business, including how the rule will be enforced: The Department has determined that this rule order will not have a significant economic impact on small businesses. Chapter NR 140, Wis. Adm. Code, currently contains groundwater standards for 123 substances of public health concern, 8 substances of public welfare concern and 15 indicator parameters. The proposed groundwater standard revisions would apply to all regulated facilities, practices and activities which may impact groundwater quality.

The enforcement of Wisconsin state groundwater quality standards is done by state regulatory agencies through their groundwater protection programs. State regulatory agencies, in exercising their statutory

powers and duties, establish groundwater protection regulations that assure that regulated facilities and activities will not cause state groundwater quality standards to be exceeded. A state regulatory agency may establish specific design and management criteria to ensure that regulated facilities and activities will not cause the concentration of a substance in groundwater, affected by the facilities or activities, to exceed state groundwater quality enforcement standards or preventive action limits at an applicable "point of standards application" location.

Regulated facilities, practices and activities, which are sources of the substances for which new and revised groundwater standards are proposed are, for the most part, likely sources of substances for which other groundwater standards already exist. Consequently, there will likely be few cases where the proposed standards will be exceeded where existing standards are not currently being exceeded. Additional monitoring costs may be imposed upon regulated facilities, practices and activities, but the extent of such monitoring and any costs associated with it, while too speculative to quantify at this time, are not expected to be significant.

The proposed revisions to state groundwater quality standards include new and revised standards for some pesticides and pesticide degradation products found in Wisconsin groundwater. New proposed groundwater quality standards include standards for the insecticide chlorpyrifos, the herbicides acetochlor, dimethenamid and propazine, and the herbicide degradation products acetochlor ethane sulfonic acid and oxanilic acid, and metolachlor ethane sulfonic acid and oxanilic acid.

The insecticide active ingredient chlorpyrifos is used on corn crops to control rootworm, and on soybean crops to control aphids and spider mites. There are currently 32 insecticide products registered in Wisconsin that contain the active ingredient chlorpyrifos. Chlorpyrifos has been reported as detected in groundwater at 2% of DATCP Agricultural Chemical Cleanup Program sites. In a DATCP 2007 statewide survey of agricultural chemicals in Wisconsin groundwater, no chlorpyrifos was reported detected in 398 private water supply wells sampled.

Acetochlor and dimethenamid/dimethenamid-P are herbicides that have been used in Wisconsin to control weeds in corn and soybeans. There are currently 46 herbicide products registered in Wiseonsin that contain the active ingredient acetochlor or dimethenamid/dimethenamid-P. Acetochlor has been reported as detected in groundwater at 25% of DATCP Agricultural Chemical Cleanup Program sites and dimethenamid/dimethenamid-P has been reported as detected at 27% of those sites. In DATCP's 2007 statewide survey of agricultural chemicals in Wisconsin groundwater, no "parent" acetochlor or dimethenamid/dimethenamid-P were reported as detected in 398 private water supply wells sampled. Metabolite degradation products of these herbicides were, however, detected in some of the sampled wells.

Propazine is a herbicide used for weed control on sorghum, umbelliferous crops (carrots, parsley etc.) and greenhouse ornamentals. It is also a contaminant of the herbicide atrazine, which is used in Wisconsin on corn. There are currently no herbicide products registered in Wisconsin that contain the active ingredient propazine. Propazine has been reported as detected in groundwater at 22% of DATCP Agricultural Chemical Cleanup Program sites.

The acetochlor ethane sulfonic acid and oxanilic acid (acetochlor ESA & OXA) degradation products of acetochlor have been found in Wisconsin groundwater. In DATCP's 2007 statewide survey of agricultural chemicals in Wisconsin groundwater, acetochlor ESA & OXA were reported as detected in 16 private water supply wells and 3 private water supply wells respectively, of 398 wells sampled. The highest levels of acetochlor ESA & OXA reported in the DATCP study were 2.32 ppb and 4.36 ppb respectively. The highest levels reported in the DATCP groundwater monitoring database for private water supply wells are 9.52 ppb for acetochlor-ESA and 4.36 ppb for acetochlor-OXA.

In the DATCP's 2007 statewide survey of agricultural chemicals in Wisconsin groundwater, metolachlor ESA & OXA were reported as detected in 106 private water supply wells and 18 private water supply wells respectively, of 398 wells sampled. The highest levels of metolachlor ESA & OXA reported in the DATCP study were 6.54 ppb and 1.37 ppb respectively. The highest levels reported in the DATCP groundwater monitoring database for private water supply wells are 31.2 ppb for metolachlor-ESA and 22.8 ppb for metolachlor-OXA.

As it appears that the occurrence of the pesticides chlorpyrifos, acetochlor, dimethenamid/dimethenamid-P and propazine in Wisconsin groundwater is limited to DATCP Agricultural Chemical Cleanup Program sites, and as the pesticide metabolite degradation products acetochlor ESA & OXA and metolachlor ESA & OXA have been detected statewide at levels relatively low compared to proposed state groundwater quality standards for those substances, and as comparably priced alternative herbicide products appear to be available to state farmers, the Department has determined that any management practice restrictions placed on the pesticides chlorpyrifos, acetochlor, dimethenamid/dimethenamid-P and propazine to limit their impact on Wisconsin groundwater, or on acetochlor or metolachlor to limit the impact of their ESA or OXA metabolite degradation products on groundwater, are unlikely to have a significant economic impact on corn or soybean growers in Wisconsin.

11. Agency Contact Person: Mike Lemcke, Wisconsin Dept. of Natural Resources, Bureau of Drinking Water & Groundwater, 101 S. Webster St., Madison, WI, 73707-7921; (608) 266-2104; michael.lemcke@wisconsin.gov.

SECTION 1. NR 140.10, Table 1 is amended to read:

Table 1
Public Health Groundwater Quality Standards

Substance[1]	Enforcement Standard (micrograms per liter - except as noted)	Preventive Action Limit (micrograms per liter - except as noted)
Acetochlor	7	0.7
Acetochlor ethane sulfonic acid + oxanilic acid (Acetochlor - ESA + OXA)	230	46
Acetone	~~1000~~ 9 mg/l	~~200~~ 1.8 mg/l
Alachlor	2	0.2
Alachlor ethane sulfonic acid ~~(Alachlor=~~ (Alachlor – ESA)	20	4
Aldicarb	10	2
Aluminum	200	40
Ammonia (as N)	9.7 mg/l	0.97 mg/l
Antimony	6	1.2
Anthracene	3000	600
Arsenic	10	1
Asbestos	7 million fibers per liter (MFL)	0.7 MFL
Atrazine, total chlorinated residues	3[2]	0.3[2]
Bacteria, Total Coliform	0[3]	0[3]
Barium	2 milligrams/liter (mg/l)	0.4 mg/l
Bentazon	300	60
Benzene	5	0.5
Benzo(b)fluoranthene	0.2	0.02
Benzo(a)pyrene	0.2	0.02
Beryllium	4	0.4

Boron	~~960~~ 1000	~~190~~ 200
Bromodichloromethane	0.6	0.06
Bromoform	4.4	0.44
Bromomethane	10	1
Butylate	400	80
Cadmium	5	0.5
Carbaryl	~~960~~ 40	~~192~~ 4
Carbofuran	40	8
Carbon disulfide	1000	200
Carbon tetrachloride	5	0.5
Chloramben	150	30
Chlordane	2	0.2
Chlorodifluoromethane	7 mg/l	0.7 mg/l
Chloroethane	400	80
Chloroform	6	0.6
Chlorpyrifos	2	0.4
Chloromethane	~~3~~ 30	~~0.3~~ 3
Chromium (total)	100	10
Chrysene	0.2	0.02
Cobalt	40	8
Copper	1300	130
Cyanazine	1	0.1
Cyanide, free[4]	200	40
Dacthal	70	14
1,2–Dibromoethane (EDB)	0.05	0.005
Dibromochloromethane	60	6
1,2–Dibromo–3–chloropropane (DBCP)	0.2	0.02
Dibutyl phthalate	~~100~~ 1000	~~20~~ 100
Dicamba	300	60
1,2–Dichlorobenzene	600	60
1,3–Dichlorobenzene	~~1250~~ 600	~~125~~ 120
1,4–Dichlorobenzene	75	15
Dichlorodifluoromethane	1000	200
1,1–Dichloroethane	850	85
1,2–Dichloroethane	5	0.5
1,1–Dichloroethylene	7	0.7
1,2–Dichloroethylene (cis)	70	7
1,2–Dichloroethylene (trans)	100	20
2,4–Dichlorophenoxyacetic Acid (2,4–D)	70	7
1,2–Dichloropropane	5	0.5
1,3–Dichloropropene (cis/trans)	~~0.2~~ 0.4	~~0.02~~ 0.04
Di (2–ethylhexyl) phthalate	6	0.6
Dimethenamid/Dimethenamid-P	50	5
Dimethoate	2	0.4
2,4–Dinitrotoluene	0.05	0.005
2,6–Dinitrotoluene	0.05	0.005
Dinitrotoluene, Total Residues[5]	0.05	0.005
Dinoseb	7	1.4
1,4–Dioxane	3	0.3
Dioxin (2, 3, 7, 8–TCDD)	0.00003	0.000003
Endrin	2	0.4
EPTC	250	50
Ethylbenzene	700	140
Ethyl ether	1000	100
Ethylene glycol	~~7 mg/l~~ 14 mg/l	~~0.7 mg/l~~ 2.8 mg/l
Fluoranthene	400	80
Fluorene	400	80
Fluoride	4 mg/l	0.8 mg/l
Fluorotrichloromethane	3490	698
Formaldehyde	1000	100
Heptachlor	0.4	0.04
Heptachlor epoxide	0.2	0.02

Hexachlorobenzene	1	0.1
N–Hexane	600	120
Hydrogen sulfide	30	6
Lead	15	1.5
Lindane	0.2	0.02
Manganese	300	60
Mercury	2	0.2
Methanol	5000	1000
Methoxychlor	40	4
Methylene chloride	5	0.5
Methyl ethyl ketone (MEK)	~~460~~ 4 mg/l	~~90~~ 0.8 mg/l
Methyl isobutyl ketone (MIBK)	500	50
Methyl tert–butyl ether (MTBE)	60	12
Metolachlor/s-Metolachlor	~~15~~ 100	~~1.5~~ 10
Metolachlor ethane sulfonic acid + oxanilic acid (Metolachlor - ESA + OXA)	1.3 mg/L	0.26 mg/L
Metribuzin	~~250~~ 70	~~50~~ 14
Molybdenum	40	8
Monochlorobenzene	100	20
Naphthalene	100	10
Nickel	100	20
Nitrate (as N)	10 mg/l	2 mg/l
Nitrate + Nitrite (as N)	10 mg/l	2 mg/l
Nitrite (as N)	1 mg/l	0.2 mg/l
N–Nitrosodiphenylamine	7	0.7
Pentachlorophenol (PCP)	1	0.1
Perchlorate	1	0.1
Phenol	~~6 mg/l~~ 2 mg/l	~~1.2 mg/l~~ 0.4 mg/l
Picloram	500	100
Polychlorinated biphenyls (PCBs)	0.03	0.003
Prometon	~~90~~ 100	~~18~~ 20
Propazine	10	2
Pyrene	250	50
Pyridine	10	2
Selenium	50	10
Silver	50	10
Simazine	4 0	.4
Styrene	100	10
Tertiary Butyl Alcohol (TBA)	12	1.2
1,1,1,2–Tetrachloroethane	70	7
1,1,2,2–Tetrachloroethane	0.2	0.02
Tetrachloroethylene	5	0.5
Tetrahydrofuran	50	10
Thallium	2	0.4
Toluene	~~1 mg/l~~ 800	~~0.2 mg/l~~ 160
Toxaphene	3	0.3
1,2,4–Trichlorobenzene	70	14
1,1,1–Trichloroethane	200	40
1,1,2–Trichloroethane	5	0.5
Trichloroethylene (TCE)	5	0.5
2,4,5–Trichlorophenoxy–propionic acid (2,4,5–TP)	50	5
1,2,3–Trichloropropane	60	12
Trifluralin	7.5	0.75
Trimethylbenzenes (1,2,4– and 1,3,5– combined)	480	96
Vanadium	30	6
Vinyl chloride	0.2	0.02
Xylene[4]	~~10 mg/l~~ 2 mg/l	~~1 mg/l~~ 0.4 mg/l

[1] Appendix I contains Chemical Abstract Service (CAS) registry numbers, common synonyms and trade names for most substances listed in Table 1.
[2] Total chlorinated atrazine residues includes parent compound and the following metabolites of health concern: 2–chloro–4–amino–6–isopropylamino–s–triazine

(formerly deethylatrazine), 2-chloro-4-amino-6-ethylamino-s-triazine (formerly deisopropylatrazine) and 2-chloro-4,6-diamino-s-triazine (formerly diaminoatrazine).

[1]Total coliform bacteria may not be present in any 100 ml sample using either the membrane filter (MF) technique, the presence-absence (P-A) coliform test, the minimal medium ONPG-MUG (MMO-MUG) test or not present in any 10 ml portion of the 10-tube multiple tube fermentation (MTF) technique.

[2]"Cyanide, free" refers to the simple cyanides (HCN, CN^-) and /or readily dissociable metal-cyanide complexes. Free cyanide is regulatorily equivalent to cyanide quantified by approved analytical methods for "amenable cyanide" or "available cyanide".

[3]Dinitrotoluene, Total Residues includes the dinitrotoluene (DNT) isomers: 2,3-DNT, 2,4-DNT, 2,5-DNT, 2,6-DNT, 3,4-DNT and 3,5-DNT.

[4]Xylene includes meta-, ortho-, and para-xylene combined. ~~The preventive action limit has been set at a concentration that is intended to address taste and odor concerns associated with this substance.~~

SECTION 2. NR 140.20, Table 3 is amended to read:

Table 3
Methodology for Establishing Preventive Action Limit for Indicator Parameters

Parameter	*Minimum Increase (mg/l)*
Alkalinity	100
Biochemical oxygen demand (BOD_5)	25
Calcium	25
Chemical oxygen demand (COD)	25
Magnesium	25
Nitrogen series	
Ammonia nitrogen	2
Organic nitrogen	2
Total nitrogen	5
Potassium	5
Sodium	10
Field specific conductance	200 ~~micromhos/cm~~ microSiemens/cm
Total dissolved solids (TDS)	200
Total hardness	100
Total organic carbon (TOC)	1
Total organic halogen (TOX)	0.25

SECTION 3. NR 140.28(5)(c)6 note is amended to read:

Note: The issuance of a wastewater discharge permit by the Department is required prior to the infiltration or injection of substances or remedial material into unsaturated soil or groundwater for discharges, as defined by s. 283.01(4), Stats. A wastewater discharge permit establishes the effluent or injection limits for substances or remedial material which may be infiltrated or injected into unsaturated soil or groundwater. A temporary exemption granted under this subsection applies to substances or remedial material which may enter groundwater or may be detected at a point of standards applications; it does not apply to substances or remedial material infiltrated or injected into unsaturated soil.

SECTION 4. Appendix to Table 1 is amended to read:

CHAPTER NR 140
APPENDIX 1 TO TABLE 1
PUBLIC HEALTH GROUNDWATER QUALITY STANDARDS

Substance	**CAS RN[1]**	**Common synonyms/*Tradename*[2]**
Acetochlor	34256-82-1	*Cadence, Degree, Harness, Keystone, Overtime, Volley*
Acetochlor ethane sulfonic acid + oxanilic acid	187022-11-3 (ESA) 184992-44-4 (OXA)	Acetochlor - ESA + OXA
Acetone	67-64-1	*Propanone*
Alachlor	15972-60-8	*Lasso*

Alachlor ethane sulfonic acid (~~Alachlor-ESA~~)	142363-53-9	Alacblor-ESA, Alachlor Ethane Sulfonate, MON 5775
Aldicarb	116-06-3	*Temik*
Aluminum	7429-90-5	
Ammonia	7664-41-7	
Anthracene	120-12-7	Para-naphthalene
Asbestos	~~12001-29-5~~ 1332-21-4	
Bentazon	25057-89-0	*Basagran*
Benzene	71-43-2	
Benzo(b)fluoranthene	205-99-2	B(b)F,3,4-Benzofluoranthene
Benzo(a)pyrene	50-32-8	BaP, B(a)P
Boron	7440-42-8	
Bromodichloromethane	75-27-4	Dichlorobromomethane, BDCM
Bromoform	75-25-2	Tribromomethane
Bromomethane	74-83-9	Methyl bromide
Butylate	2008-41-5	S-ethyl di-isobutylthiocarbamate, *Sutan+*
Carbaryl	63-25-2	*Sevin*
Carbofuran	1563-66-2	*Furadan*
Carbon disulfide	75-15-0	Carbon bisulfide
Carbon tetrachloride	56-23-5	Tetrachloromethane, Perchloroethane
Chloramben	133-90-4	
Chlordane	57-74-9	
Chlorodifluoromethane	75-45-6	HCFC-22, Freon 22
Chloroethane	75-00-3	Ethyl chloride, Monochloroethane
Chloroform	67-66-3	Trichloromethane
Chlorpyrifos	2921-88-2	*Dursban, Lorsban, Warhawk, Hatchet, Yuma, Whirlwind, Eraser*
Chloromethane	74-87-3	Methyl chloride
Chromium (total)	7440-47-3	
Chrysene	218-01-9	1,2-Benzphenanthrene
Cobalt	7440-48-4	
Cyanazine	21725-46-2	*Bladex* , 2-chloro-4-ethylamino-6-nitriloisopropylamino-s-triazine
Cyanide, free	57-12-5	
Dacthal	1861-32-1	DPCA, Chlorothal, *Dacthalor*, 1,4-benzenedicarboxylic acid
Dibromochloromethane	124-48-1	Chlorodibromomethane, DBCM
1,2-Dibromo-3-chloropropane	96-12-8	DBCP, Dibromochloropropane
1,2-Dibromoethane	106-93-4	EDB, Ethylene dibromide, Dibromoethane
Dibutyl phthalate	84-74-2	DP, Di-*n*-butyl phthalate, *n*-Butyl phthalate
Dicamba	1918-00-9	*Banvel*
1,2-Dichlorobenzene	95-50-1	o-Dichlorobenzene, o-DCB
1,3-Dichlorobenzene	541-73-1	m-Dichlorobenzene, m-DCB
1,4-Dichlorobenzene	106-46-7	p-Dichlorobenzene, p-DCB
Dichlorodifluoromethane	75-71-8	*Freon 12*
1,1,-Dichloroethane	75-34-3	Ethylidine chloride
1,2-Dichloroethane	107-06-2	1,2-DCA, Ethylene dichloride
1,1-Dichloroethylene	75-35-4	1,1-DCE, 1,1-Dichloroethene, Vinylidene chloride
1,2-Dichloroethylene (cis)	156-59-2	cis-Dichloroethylene, 1,2-Dichloroethene (cis)
1,2-Dichloroethylene (trans)	156-60-5	trans-1,2-Dichloroethylene
2,4-Dichlorophenoxyacetic acid	94-75-7	2,4-D
1,2-Dichloropropane	78-87-5	Propylene dichloride
1,3-Dichloropropene (cis/trans)[3]	542-75-6	*Telone,* DCP, Dichloropropylene
Di(2-ethylhexyl) phthalate	117-81-7	DEHP, Bis(2-ethylhexyl) phthalate, 1,2-Benzenedicarboxylic acid, Bis (2-ethyl-hexyl)ester
Dimethenamid/Dimethinamid-P	87674-68-8 163515-14-8 (-P)	*Frontier, Outlook, Propel, Establish, Sortie, Tower*
Dimethoate	60-51-5	
2,4-Dinitrotoluene	121-14-2	2,4-DNT, 1-methyl-2,4-dinitrobenzene

2,6–Dinitrotoluene	606–20–2		2,6–DNT, 2–methyl–1,3–dinitrobenzene
Dinitrotoluene, Total Residues	25321-14-6		Dinitrotoluene, DNT
Dinoseb	88–85–7		2–(1–methylpropyl)–4,6–dinitrophenol
1,4–Dioxane	123-91-1		*p*-Dioxane
Dioxin	1746–01–6		2,3,7,8–TCDD,2,3,7,8–Tetrachlorodibenzo–p–dioxin
Endrin	72–20–8		
EPTC	759–94–4		*Eptam, Eradicane*
Ethylbenzene	100–41–4		Phenylethane, EB
Ethyl ether	60-29-7		Diethyl Ether
Ethylene glycol	107–21–1		
Fluoranthene	206–44–0		Benzo(jk)fluorene
Fluorene	86–73–7		2,3–Benzidine, Diphenylenemethane
Fluoride	~~16984–48–8~~ 7681-49-4		
Fluorotrichloromethane	75–69–4		*Freon11*, Trichlorofluoromethane
Formaldehyde	50–00–0		
Heptachlor	76–44–8		*Velsicol*
Heptachlor epoxide	1024–57–3		
Hexachlorobenzene	118–74–1		Perchlorobenzene, *Granox*
N–Hexane	110–54–3		Hexane, Skellysolve B
Hydrogen sulfide	7783–06–4		Dihydrogen sulfide
Lindane	58–89–9		
Manganese	7439-96-5		
Mercury	7439–97–6		
Methanol	67–56–1		Methyl alcohol, Wood alcohol
Methoxychlor	72–43–5		
Methylene chloride	75–09–2		Dichloromethane, Methylene dichloride
Methyl ethyl ketone	78–93–3		MEK, 2–Butanone
Methyl isobutyl ketone	108–10–1		MIBK, 4–Methyl–2–pentanone, Isopropylacetone, *Hexone*
Methyl tert–butyl ether	1634–04–4		MTBE, 2–Methoxy–2–methyl–propane, tert–Butyl methyl ether
Metolachlor/s-Metolachlor	51218–45–2		*Dual, Bicep, Milocep, Stalwart, Parallel, Prefix,*
	87392-12-9	(s-)	*Charger, Brawl, Cinch, Dual Magnum, Boundary*
Metolachlor ethane sulfonic acid + oxanilic acid	171118-09-5	(ESA)	Metolachlor - ESA + OXA
	152019-73-3	(OXA)	
Metribuzin	21087–64–9		Sencor, Lexone
Molybdenum	7439–98–7		
Monochlorobenzene	108–90–7		Chlorobenzene
Naphthalene	91–20–3		
N–Nitrosodiphenylamine	86–30–6		NDPA
Pentachlorophenol	87–86–5		PCP, Pentachlorohydroxybenzene
Perchlorate	14797-73-0		Perchlorate and perchlorate salts, Perchlorate ion
Phenol	108–95–2		
Picloram	1918–02–1		*Tordon*, 4–amino–3,5,6–trichloropicolinic acid
Polychlorinated biphenyls[4]			PCBs
Prometon	1610–18–0		*Pramitol, Prometone*
Pyrene	129–00–		Benzo(def)phenanthrene
Pyridine	110–86–1		Azabenzene
Simazine	122–34–9		*Princep*, 2–chloro–4,6–diethylamino–s–triazine
Styrene	100–42–5		Ethenylbenzene, Vinylbenzene
Tertiary Butyl Alcohol	75-65-0		TBA
1,1,1,2–Tetrachlorethane	630–20–6		1,1,1,2–TCA, 1,1,1,2-PCA
1,1,2,2,–Tetrachloroethane	79–34–5		1,1,2,2–TCA, 1,1,2,2-PCA
Tetrachloroethylene	127–18–4		Perchloroethylene, PERC, Tetrachloroethene
Tetrahydrofuran	109–99–9		THF
Toluene	108–88–3		Methylbenzene
Toxaphene	8001–35–2		
1,2,4–Trichlorobenzene	120–82–1		

1,1,1–Trichloroethane	71–55–6	Methyl chloroform, 1,1,1-TCA
1,1,2–Trichloroethane	79–00–5	1,1,2–TCA, Vinyl trichloride
Trichloroethylene	79–01–6	TCE, Chloroethene
2,4,5–Trichlorophenoxy–propionic acid	93–72–1	2,4,5–TP,*Silvex*
1,2,3–Trichloropropane	96–18–4	1,2,3–TCP, Glycerol trichlorohyrin
Trifluralin	1582–09–8	*Treflan*
1,2,4–Trimethylbenzene	95–63–6	
1,3,5–Trimethylbenzene	108–67–8	
Vanadium	7440–62–2	
Vinyl chloride	75–01–4	VC, Chloroethene
Xylene[5]		

[1]Chemical Abstracts Service (CAS) registry numbers are unique numbers assigned to a chemical substance. The CAS registry numbers were published by the U.S. Environmental Protection Agency in 40 CFR Part 264, Appendix IV

[2]Common synonyms include those widely used in government regulations, scientific publications, commerce and the general public. A trade name, also known as the proprietary name, is the specific, registered name given by a manufacturer to a product. Trade names are listed in *italics*. Common synonyms and trade names should be cross–referenced with CAS registry number to ensure the correct substance is identified.

[3]This is a combined chemical substance which includes cis 1,3–Dichloropropene (CAS RN 10061–01–5) and trans 1,3–Dichloropropene (CAS RN 10061–02–6).

[4]Polychlorinated biphenyls (CAS RN 1336–36–3); this category contains congener chemicals (same molecular composition, different molecular structure and formula), including constituents of Aroclor–1016 (CAS RN12674–11–2), Aroclor–1221 (CAS RN 11104–28–2), Aroclor–1232 (CAS RN 11141–16–5), Aroclor–1242 (CAS RN 53469–21–9), Aroclor–1248 (CAS RN 12672–29–6), Aroclor–1254 (CAS RN 11097–69–1), and Aroclor–1260 (CAS RN 11096–82–5).

[5]Xylene (CAS RN 1330–20–7) refers to a mixture of three isomers, meta–xylene (CAS RN 108–38–3), ortho–xylene (CAS RN 95–47–6), and para–xylene (CAS RN 106–42–3)

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

The rules 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 _____
Matthew J. Frank, Secretary

(SEAL)