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 ESA + OXA, Ammonia (as N), Chlorodifluoromethane, Chlorpyrifos, Dimethenamid/Dimethenamid-P, Dinitrotoluene Total Residues, Ethyl Ether, Metolachlor ESA + 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).
- 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 μS/cm (microsiemens per centimeter).
- 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/cu.m 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 2 (CCL 2). Substances currently on EPA's CCL 2 include: Aluminum, Acetochlor, Acetochlor-ESA, Acetochlor-OXA, Metolachlor-ESA, Metolachlor-OXA and Perchlorate. Substances currently proposed for inclusion on EPA's draft CCL 3 include: 1,4-Dioxane, Acetochlor, Acetochlor-ESA, Acetochlor-OXA, Chlorodifluoromethane, Metolachlor-ESA, 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 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 standard levels 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* (dated May 2009), 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 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 in corn to control rootworm, and in soybeans 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 Wisconsin 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.

12. Place where comments are to be submitted and deadline for submission: Written comments may be submitted at the public hearings, by regular mail, fax or email to:

Mike Lemcke
Department of Natural Resources - DG/5
Bureau of Drinking Water and Groundwater
P.O. Box 7921
Madison, WI, 53707
Fax: (608) 267-7650
E-mail: michael.lemcke@wisconsin.gov

Written comments may also be submitted to the Department using the Wisconsin Administrative Rules Internet Web site at http://adminrules.wisconsin.gov.

Comment submission deadline is Dec. 30, 2009. Hearing dates are to be determined.

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	1	0.1
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	170	17
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	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	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/1	0.2 mg/l
N−Nitrosodiphenylamine	7	0.7
Pentachlorophenol (PCP)	1	0.1
Perchlorate	7	0.7
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).
[3] 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.
[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~~ µS/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	Alachlor−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		*Frontier, Outlook, Propel, Establish, Sortie,*
	163515-14-8	(-P)	*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	7790-98-9		Ammonium perchlorate
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 RN 12674−11−2), 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)