

Exhibit C. Revisor's Office Approved Proposed Rules

Office of the Revisor of Statutes

Administrative Rules



TITLE: Proposed Permanent Rules Relating to Health Risk Limits for Groundwater Standards

AGENCY: Department of Health

REVISOR ID: R-4587

MINNESOTA RULES: Chapter 4717

The attached rules are approved for
publication in the State Register

A handwritten signature in cursive script, reading "Sandy Glass-Sirany".

Sandy Glass-Sirany
Senior Assistant Revisor

1.1 **Department of Health**1.2 **Proposed Permanent Rules Relating to Health Risk Limits for Groundwater Standards**1.3 **4717.7860 HEALTH RISK LIMITS TABLE.**1.4 *[For text of subparts 1 to 3b, see Minnesota Rules]*1.5 **Subp. 3c. Acetone.**

1.6 CAS number: 67-64-1

1.7 Year Adopted: ~~2011~~ 2023

1.8 Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer
HRL (µg/L)	ND	9,000 <u>5,000</u>	8,000 <u>5,000 (2)</u>	4,000 <u>3,000</u>	NA
RfD (mg/kg-day)	--	5.0 <u>3.1</u>	3.0 <u>(2)</u>	0.90 <u>0.69</u>	--
RSC	--	0.5	0.2 <u>(2)</u>	0.2	--
SF (per mg/kg-day)	--	--	--	--	--
ADAF or AF_{lifetime}	--	--	--	--	--
Intake Rate (L/kg-day)	--	0.289 <u>0.290</u>	0.077 <u>(2)</u>	0.043 <u>0.045</u>	--
Endpoints	--	renal (kidney) system	renal (kidney) system; hematological (blood) system	hematological (blood) system, <u>hepatic (liver) system,</u> renal (kidney) system	--

1.25 *[For text of subparts 3d to 4, see Minnesota Rules]*1.26 **Subp. 4a. Aminomethylphosphonic acid (AMPA).**1.27 CAS number: 1066-51-91.28 Year Adopted: 20231.29 Volatility: Nonvolatile

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
2.1						
2.2	<u>HRL (µg/L)</u>	<u>ND</u>	<u>ND</u>	<u>3,000</u>	<u>1,000</u>	<u>--</u>
2.3	<u>RfD</u>	<u>--</u>	<u>--</u>	<u>0.96</u>	<u>0.32</u>	<u>--</u>
2.4	<u>(mg/kg-day)</u>					
2.5	<u>RSC</u>	<u>--</u>	<u>--</u>	<u>0.2</u>	<u>0.2</u>	<u>--</u>
2.6	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
2.7	<u>mg/kg-day)</u>					
2.8	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
2.9	<u>AF_{lifetime}</u>					
2.10	<u>Intake Rate</u>	<u>--</u>	<u>--</u>	<u>0.074</u>	<u>0.045</u>	<u>--</u>
2.11	<u>(L/kg-day)</u>					
2.12	<u>Endpoints</u>	<u>--</u>	<u>--</u>	<u>hepatic (liver)</u>	<u>hepatic (liver)</u>	<u>--</u>
2.13				<u>system, renal</u>	<u>system, renal</u>	
2.14				<u>(kidney) system</u>	<u>(kidney) system</u>	

2.15 *[For text of subparts 5 to 6b, see Minnesota Rules]*

2.16 Subp. 6c. Benzo[a]pyrene.

2.17 CAS number: 50-32-8

2.18 Year Adopted: 2023

2.19 Volatility: Low

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
2.20						
2.21	<u>HRL (µg/L)</u>	<u>ND</u>	<u>0.5</u>	<u>0.5 (2)</u>	<u>0.1</u>	
2.22	<u>RfD</u>	<u>--</u>	<u>0.00031</u>	<u>(2)</u>	<u>(2)</u>	<u>--</u>
2.23	<u>(mg/kg-day)</u>					
2.24	<u>RSC</u>	<u>--</u>	<u>0.5</u>	<u>(2)</u>	<u>(2)</u>	<u>--</u>
2.25	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>1</u>
2.26	<u>mg/kg-day)</u>					
2.27	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>10 (ADAF_{<2})</u>
2.28	<u>AF_{lifetime}</u>					<u>3 (ADAF_{2 to <16})</u>
2.29						<u>1 (ADAF₁₆₊)</u>
2.30						

3.1	<u>Intake Rate</u> <u>(L/kg-day)</u>	--	<u>0.290</u>	<u>(2)</u>	<u>(2)</u>	<u>0.155</u> (<2)	
3.2							
3.3							<u>0.040</u> (2 to <16)
3.4							
3.5	<u>Endpoints</u>	--	developmental,	developmental,	developmental,	<u>cancer</u>	
3.6			<u>nervous</u>	<u>nervous</u>	<u>nervous</u>		
3.7			<u>system</u>	<u>system</u>	<u>system</u>		

3.8 Subp. 6d. **Benzophenone.**3.9 CAS number: 119-61-93.10 Year Adopted: 20233.11 Volatility: Low

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
3.12						
3.13	<u>HRL (µg/L)</u>	<u>ND</u>	<u>900</u>	<u>100</u>	<u>100 (3)</u>	<u>NA</u>
3.14	<u>RfD</u> <u>(mg/kg-day)</u>	--	<u>0.52</u>	<u>0.053</u>	<u>(3)</u>	--
3.15						
3.16	<u>RSC</u>	--	<u>0.5</u>	<u>0.2</u>	<u>(3)</u>	--
3.17	<u>SF (per</u> <u>mg/kg-day)</u>	--	--	--	--	--
3.18						
3.19	<u>ADAF or</u> <u>AF_{lifetime}</u>	--	--	--	--	--
3.20						
3.21	<u>Intake Rate</u> <u>(L/kg-day)</u>	--	<u>0.290</u>	<u>0.074</u>	<u>(3)</u>	--
3.22						
3.23	<u>Endpoints</u>	--	<u>developmental</u>	<u>hepatic (liver)</u>	<u>hepatic (liver)</u>	--
3.24				<u>system, renal</u>	<u>system, renal</u>	
3.25				<u>(kidney) system</u>	<u>(kidney) system</u>	

3.26 Subp. 6e. **1H-Benzotriazole.**3.27 CAS number: 95-14-73.28 Year Adopted: 20233.29 Volatility: Low

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
4.1					
4.2	<u>HRL (µg/L)</u>	<u>ND</u>	<u>20</u>	<u>20 (2)</u>	<u>NA</u>
4.3	<u>RfD</u>	<u>--</u>	<u>0.023</u>	<u>(2)</u>	<u>--</u>
4.4	<u>(mg/kg-day)</u>				
4.5	<u>RSC</u>	<u>--</u>	<u>0.2</u>	<u>(2)</u>	<u>--</u>
4.6	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
4.7	<u>mg/kg-day)</u>				
4.8	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
4.9	<u>AF_{lifetime}</u>				
4.10	<u>Intake Rate</u>	<u>--</u>	<u>0.290</u>	<u>(2)</u>	<u>--</u>
4.11	<u>(L/kg-day)</u>				
4.12	<u>Endpoints</u>	<u>--</u>	<u>developmental</u>	<u>developmental</u>	<u>developmental</u>

4.13 Subp. 6f. Biphenyl.4.14 CAS number: 92-52-44.15 Year Adopted: 20234.16 Volatility: Moderate

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
4.17					
4.18	<u>HRL (µg/L)</u>	<u>400</u>	<u>100</u>	<u>100 (2)</u>	<u>10</u>
4.19	<u>RfD</u>	<u>0.58</u>	<u>0.18</u>	<u>(2)</u>	<u>--</u>
4.20	<u>(mg/kg-day)</u>				
4.21	<u>RSC</u>	<u>0.2</u>	<u>0.2</u>	<u>(2)</u>	<u>--</u>
4.22	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>0.008</u>
4.23	<u>mg/kg-day)</u>				
4.24	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>10 (ADAF_{<2})</u>
4.25	<u>AF_{lifetime}</u>				
4.26					<u>3 (ADAF_{2 to <16})</u>
4.27					<u>1 (ADAF₁₆₊)</u>
4.28	<u>Intake Rate</u>	<u>0.290</u>	<u>0.290</u>	<u>(2)</u>	<u>0.155 (<2)</u>
4.29	<u>(L/kg-day)</u>				
4.30					<u>0.040 (2 to <16)</u>

5.1					<u>0.042</u> ₍₁₆₊₎
5.2	Endpoints	<u>renal</u> <u>(kidney)</u> <u>system</u>	<u>renal (kidney)</u> <u>system</u>	<u>renal (kidney)</u> <u>system</u>	<u>cancer</u>
5.3					
5.4					

5.5 Subp. ~~6e~~ 6g. **Bisphenol A (BPA).**

5.6 CAS number: 80-05-7

5.7 Year Adopted: 2015

5.8 Volatility: Nonvolatile

5.9		Acute	Short-term	Subchronic	Chronic	Cancer
5.10	HRL (µg/L)	ND	100	20	20 (3)	NA
5.11	RfD	--	0.16	0.0065	(3)	--
5.12	(mg/kg-day)					
5.13	RSC	--	0.2	0.2	(3)	--
5.14	SF (per	--	--	--	--	--
5.15	mg/kg-day)					
5.16	ADAF or	--	--	--	--	--
5.17	AF_{lifetime}					
5.18	Intake Rate	--	0.289	0.077	(3)	--
5.19	(L/kg-day)					
5.20	Endpoints	--	developmental, female reproductive system (E), hepatic (liver) system, male reproductive system (E), renal (kidney) system, thyroid (E)	hepatic (liver) system, renal (kidney) system	hepatic (liver) system, renal (kidney) system	--
5.21						
5.22						
5.23						
5.24						
5.25						
5.26						
5.27						
5.28						
5.29						
5.30						

6.1 Subp. 6h. Bromodichloromethane.6.2 CAS number: 75-27-46.3 Year Adopted: 20236.4 Volatility: High

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
6.5					
6.6	<u>HRL (µg/L)</u>	<u>400</u>	<u>30</u>	<u>30 (2)</u>	<u>30</u>
6.7	<u>RfD</u>	<u>0.073</u>	<u>0.039</u>	<u>(2)</u>	<u>0.0075</u>
6.8	<u>(mg/kg-day)</u>				<u>--</u>
6.9	<u>RSC</u>	<u>0.2</u>	<u>0.2</u>	<u>(2)</u>	<u>0.2</u>
6.10	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
6.11	<u>mg/kg-day)</u>				<u>0.035</u>
6.12	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>10 (ADAF_{<2})</u>
6.13	<u>AF_{lifetime}</u>				<u>3 (ADAF_{2 to <16})</u>
6.14					<u>1 (ADAF₁₆₊)</u>
6.15					
6.16	<u>Intake Rate</u>	<u>0.038</u>	<u>0.290</u>	<u>(2)</u>	<u>0.045</u>
6.17	<u>(L/kg-day)</u>				<u>0.155 (<2)</u>
6.18					<u>0.040 (2 to <16)</u>
6.19					<u>0.042 (16+)</u>
6.20	<u>Endpoints</u>	<u>female</u>	<u>immune</u>	<u>immune</u>	<u>hepatic (liver)</u>
6.21		<u>reproductive</u>	<u>system,</u>	<u>system,</u>	<u>system</u>
6.22		<u>system (E)</u>	<u>spleen</u>	<u>spleen</u>	<u>cancer</u>

6.23 Subp. 6i. Butyl benzyl phthalate.6.24 CAS number: 85-68-76.25 Year Adopted: 20156.26 Volatility: Low

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
6.27					
6.28	<u>HRL (µg/L)</u>	<u>100</u>	<u>100</u>	<u>100 (2)</u>	<u>100 (2)</u>
					<u>NA</u>

7.1	RfD	0.15	0.15	(2)	(2)	--
7.2	(mg/kg-day)					
7.3	RSC	0.2	0.2	(2)	(2)	--
7.4	SF (per	--	--	--	--	--
7.5	mg/kg-day)					
7.6	ADAF or	--	--	--	--	--
7.7	AF_{lifetime}					
7.8	Intake Rate	0.289	0.289	(2)	(2)	--
7.9	(L/kg-day)					
7.10	Endpoints	developmental	developmental	developmental	developmental	--
7.11		(E)	(E)	(E)	(E)	

7.12 Subp. ~~6e~~ 6j. **Cadmium.**

7.13 CAS number: 7440-43-9

7.14 Year Adopted: 2015

7.15 Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer	
7.16						
7.17	HRL (µg/L)	5	1	1	0.5	NA
7.18	RfD	0.0077	0.0016	0.00044	0.00011	--
7.19	(mg/kg-day)					
7.20	RSC	0.2	0.2	0.2	0.2	--
7.21	SF (per	--	--	--	--	--
7.22	mg/kg-day)					
7.23	ADAF or	--	--	--	--	--
7.24	AF_{lifetime}					
7.25	Intake Rate	0.289	0.289	0.077	0.043	--
7.26	(L/kg-day)					
7.27	Endpoints	developmental	developmental,	developmental,	renal (kidney)	--
7.28			nervous system,	skeletal	system, skeletal	
7.29			renal (kidney)			
7.30			system			

8.1 Subp. ~~6f~~ 6k. **Carbamazepine.**

8.2 CAS number: 298-46-4

8.3 Year Adopted: 2013

8.4 Volatility: Nonvolatile

8.5		Acute	Short-term	Subchronic	Chronic	Cancer
8.6	HRL (µg/L)	40	40	40 (2)	40 (2)	NA
8.7	RfD	0.013	0.013	(2)	(2)	--
8.8	(mg/kg-day)					
8.9	RSC	0.8	0.8	(2)	(2)	--
8.10	SF (per	--	--	--	--	--
8.11	mg/kg-day)					
8.12	ADAF or	--	--	--	--	--
8.13	AF_{lifetime}					
8.14	Intake Rate	0.289	0.289	(2)	(2)	--
8.15	(L/kg-day)					
8.16	Endpoints	develop-	develop-	develop-	develop-	--
8.17		mental,	mental,	mental,	mental,	
8.18		nervous	hematological	hematological	hematological	
8.19		system	(blood)	(blood)	(blood)	
8.20			system,	system,	system,	
8.21			hepatic (liver)	hepatic (liver)	hepatic (liver)	
8.22			system,	system,	system,	
8.23			immune	immune	immune	
8.24			system,	system,	system,	
8.25			nervous	nervous	nervous	
8.26			system, male	system, male	system, male	
8.27			reproductive	reproductive	reproductive	
8.28			system (E),	system (E),	system (E),	
8.29			female	female	female	
8.30			reproductive	reproductive	reproductive	
8.31			system (E),	system (E),	system (E),	
8.32			thyroid (E)	thyroid (E)	thyroid (E)	

9.1 **Subp. ~~6g~~ 6l. Carbon tetrachloride.**

9.2 CAS number: 56-23-5

9.3 Year Adopted: 2013

9.4 Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer	
9.5 9.6	HRL (µg/L)	100	3	3 (2)	3 (2)	1
9.7 9.8	RfD (mg/kg-day)	0.18	0.0037	(2)	(2)	--
9.9	RSC	0.2	0.2	(2)	(2)	--
9.10 9.11	SF (per mg/kg-day)	--	--	--	--	0.07
9.12 9.13 9.14 9.15	ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
9.16 9.17 9.18 9.19	Intake Rate (L/kg-day)	0.289	0.289	(2)	(2)	0.137 (<2) 0.047 (2 to <16) 0.039 (16+)
9.20 9.21 9.22 9.23 9.24	Endpoints	developmental, hepatic (liver) system	hepatic (liver) system	hepatic (liver) system	hepatic (liver) system	cancer

9.25 *[For text of subparts 7 to 8e, see Minnesota Rules]*9.26 **Subp. 8f. 1, 4-Dichlorobenzene.**9.27 CAS number: 106-46-79.28 Year Adopted: 20239.29 Volatility: High

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
10.1					
10.2	<u>HRL (µg/L)</u>	<u>ND</u>	<u>50</u>	<u>50 (2)</u>	<u>NA</u>
10.3	<u>RfD</u>	<u>--</u>	<u>0.069</u>	<u>(2)</u>	<u>--</u>
10.4	<u>(mg/kg-day)</u>				
10.5	<u>RSC</u>	<u>--</u>	<u>0.2</u>	<u>(2)</u>	<u>--</u>
10.6	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
10.7	<u>mg/kg-day)</u>				
10.8	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
10.9	<u>AF_{lifetime}</u>				
10.10	<u>Intake Rate</u>	<u>--</u>	<u>0.290</u>	<u>(2)</u>	<u>--</u>
10.11	<u>(L/kg-day)</u>				
10.12	<u>Endpoints</u>	<u>--</u>	<u>developmental,</u>	<u>developmental,</u>	<u>developmental,</u>
10.13			<u>hepatic (liver)</u>	<u>hepatic (liver)</u>	<u>hepatic (liver)</u>
10.14			<u>system, nervous</u>	<u>system, nervous</u>	<u>system, nervous</u>
10.15			<u>system</u>	<u>system</u>	<u>system</u>

10.16 Subp. 8f 8g. **Dichlorodifluoromethane.**

10.17 CAS number: 75-71-8

10.18 Year Adopted: 2011

10.19 Volatility: High

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
10.20					
10.21	<u>HRL (µg/L)</u>	<u>ND</u>	<u>ND</u>	<u>700</u>	<u>NA</u>
10.22	<u>RfD</u>	<u>--</u>	<u>--</u>	<u>0.15</u>	<u>--</u>
10.23	<u>(mg/kg-day)</u>				
10.24	<u>RSC</u>	<u>--</u>	<u>--</u>	<u>0.2</u>	<u>--</u>
10.25	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
10.26	<u>mg/kg-day)</u>				
10.27	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
10.28	<u>AF_{lifetime}</u>				
10.29	<u>Intake Rate</u>	<u>--</u>	<u>--</u>	<u>0.043</u>	<u>--</u>
10.30	<u>(L/kg-day)</u>				
10.31	<u>Endpoints</u>	<u>--</u>	<u>--</u>	<u>None</u>	<u>--</u>

11.1 Subp. ~~8g~~ 8h. **1,2-Dichloroethane.**

11.2 CAS number: 107-06-2

11.3 Year Adopted: 2013

11.4 Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer	
11.5 11.6	HRL (µg/L)	ND	200	200 (2)	60	1
11.7 11.8	RfD (mg/kg-day)	--	0.23	(2)	0.012	--
11.9	RSC	--	0.2	(2)	0.2	--
11.10 11.11	SF (per mg/kg-day)	--	--	--	--	0.091
11.12 11.13 11.14 11.15	ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2}) 3 (ADAF _{2 to <16}) 1 (ADAF ₁₆₊)
11.16 11.17 11.18 11.19	Intake Rate (L/kg-day)	--	0.289	(2)	0.043	0.137 (<2) 0.047 (2 to <16) 0.039 (16+)
11.20 11.21 11.22 11.23	Endpoints	--	hepatic (liver) system	hepatic (liver) system	renal (kidney) system, hepatic (liver) system	cancer

11.24 Subp. ~~8h~~ 8i. **trans-1,2-Dichloroethene.**

11.25 CAS number: 156-60-5

11.26 Year Adopted: ~~2013~~ 2023

11.27 Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer	
11.28 11.29	HRL (µg/L)	ND	ND	200 <u>50</u>	40 <u>9</u>	NA

12.1	RfD	--	--	0.091 <u>0.020</u>	0.0091 <u>0.0020</u>	--
12.2	(mg/kg-day)					
12.3	RSC	--	--	0.2	0.2	--
12.4	SF (per	--	--	--	--	--
12.5	mg/kg-day)					
12.6	ADAF or	--	--	--	--	--
12.7	AF_{lifetime}					
12.8	Intake Rate	--	--	0.077 <u>0.074</u>	0.043 <u>0.045</u>	--
12.9	(L/kg-day)					
12.10	Endpoints	--	--	immune system	immune system	--

12.11 Subp. 8i 8j. **1,1-Dichloroethylene (Vinylidene chloride).**

12.12 CAS number: 75-35-4

12.13 Year Adopted: ~~2011~~ 2023

12.14 Volatility: High

12.15		Acute	Short-term	Subchronic	Chronic	Cancer
12.16	HRL (µg/L)	ND	ND	200	200	NA
12.17	RfD	--	--	0.090 <u>0.069</u>	0.046 <u>0.040</u>	--
12.18	(mg/kg-day)					
12.19	RSC	--	--	0.2	0.2	--
12.20	SF (per	--	--	--	--	--
12.21	mg/kg-day)					
12.22	ADAF or	--	--	--	--	--
12.23	AF_{lifetime}					
12.24	Intake Rate	--	--	0.077 <u>0.074</u>	0.043 <u>0.045</u>	--
12.25	(L/kg-day)					
12.26	Endpoints	--	--	hepatic (liver)	hepatic (liver)	--
12.27				system	system	

13.1 Subp. 8k. 1, 2-Dichloropropane.

13.2 CAS number: 78-87-5

13.3 Year Adopted: 2023

13.4 Volatility: High

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
13.5					
13.6	<u>HRL (µg/L)</u>	<u>ND</u>	<u>20</u>	<u>20 (2)</u>	<u>3</u>
13.7	<u>RfD</u>	<u>--</u>	<u>0.029</u>	<u>(2)</u>	<u>--</u>
13.8	<u>(mg/kg-day)</u>				
13.9	<u>RSC</u>	<u>--</u>	<u>0.2</u>	<u>(2)</u>	<u>--</u>
13.10	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>0.037</u>
13.11	<u>mg/kg-day)</u>				
13.12	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>10</u>
13.13	<u>AF_{lifetime}</u>				<u>(ADAF_{<2})</u>
13.14					<u>3</u>
13.15					<u>(ADAF₂</u>
13.16					<u>to <16)</u>
13.17					<u>1</u>
13.18					<u>(ADAF₁₆₊)</u>
13.19	<u>Intake Rate</u>	<u>--</u>	<u>0.290</u>	<u>(2)</u>	<u>0.155_(<2)</u>
13.20	<u>(L/kg-day)</u>				<u>0.040_{(2 to}</u>
13.21					<u>≤16)</u>
13.22					<u>0.042₍₁₆₊₎</u>
13.23	<u>Endpoints</u>	<u>--</u>	<u>developmental</u>	<u>developmental</u>	<u>developmental</u>
					<u>cancer</u>

13.24 [For text of subparts 9 to 12, see Minnesota Rules]

13.25 Subp. 12a. 17α-Ethinylestradiol.

13.26 CAS number: 57-63-6

13.27 Year Adopted: 2023

13.28 Volatility: Nonvolatile

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
13.29					
13.30	<u>HRL (µg/L)</u>	<u>ND</u>	<u>0.0005</u>	<u>0.0002</u>	<u>NA</u>

14.1	RfD	--	<u>1.7 x 10⁻⁷</u>	<u>1.4 x 10⁻⁸</u>	<u>1.4 x 10⁻⁸</u>	--
14.2	(mg/kg-day)					
14.3	RSC	--	<u>0.8</u>	<u>0.8</u>	<u>0.8</u>	--
14.4	SF (per	--	--	--	--	--
14.5	mg/kg-day)					
14.6	ADAF or	--	--	--	--	--
14.7	AF_{lifetime}					
14.8	Intake Rate	--	<u>0.290</u>	<u>0.074</u>	<u>0.045</u>	--
14.9	(L/kg-day)					
14.10	Endpoints	--	<u>developmental</u>	<u>developmental</u>	<u>developmental</u>	--
14.11			<u>(E), female</u>			
14.12			<u>reproductive</u>			
14.13			<u>system (E),</u>			
14.14			<u>male</u>			
14.15			<u>reproductive</u>			
14.16			<u>system (E)</u>			

14.17 Subp. ~~12a~~ 12b. **Ethylbenzene.**

14.18 CAS number: 100-41-4

14.19 Year Adopted: ~~2011~~ 2023

14.20 Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer	
14.21						
14.22	HRL (µg/L)	ND	50 <u>40</u>	50 (2) <u>40 (2)</u>	50 (2) <u>40 (2)</u>	NA
14.23	RfD	--	0.075 <u>0.06</u>	(2)	(2)	--
14.24	(mg/kg-day)					
14.25	RSC	--	0.2	(2)	(2)	--
14.26	SF (per	--	--	--	--	--
14.27	mg/kg-day)					
14.28	ADAF or	--	--	--	--	--
14.29	AF_{lifetime}					

15.1	Intake Rate (L/kg-day)	--	0.289 <u>0.290</u>	(2)	(2)	--
15.2						
15.3	Endpoints	--	hepatic (liver)	hepatic (liver)	hepatic (liver)	--
15.4			system, renal	system, renal	system, renal	
15.5			(kidney) system	(kidney) system	(kidney) system	

15.6 Subp. ~~12b~~ 12c. **S-Ethyl-N,N-dipropylthiocarbamate (EPTC).**

15.7 CAS number: 759-94-4

15.8 Year Adopted: 2018

15.9 Volatility: Moderate

15.10		Acute	Short-term	Subchronic	Chronic	Cancer
15.11	HRL (µg/L)	300	300	90	40	NA
15.12	RfD (mg/kg-day)	0.16	0.16	0.033	0.0083	--
15.13						
15.14	RSC	0.5	0.5	0.2	0.2	--
15.15	SF (per mg/kg-day)	--	--	--	--	--
15.16						
15.17	ADAF or AF_{lifetime}	--	--	--	--	--
15.18						
15.19	Intake Rate (L/kg-day)	0.285	0.285	0.070	0.044	--
15.20						
15.21	Endpoints	nervous system	developmental,	cardiovascular	cardiovascular	--
15.22				system	system	
15.23			female			
15.24			reproductive			
15.25			system, nervous system			

15.26 Subp. ~~12e~~ 12d. **Ethylene glycol.**

15.27 CAS number: 107-21-1

15.28 Year Adopted: ~~2011~~ 2023

15.29 Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer	
16.1						
16.2	HRL (µg/L)	4,000 <u>ND</u>	4,000 <u>2,000</u>	2,000	2,000	NA
16.3	RfD	0.76 <u>--</u>	0.76 <u>0.33</u>	0.72 <u>(2)</u>	0.50 <u>(2)</u>	--
16.4	(mg/kg-day)					
16.5	RSC	0.2 <u>--</u>	0.2	0.2 <u>(2)</u>	0.2 <u>(2)</u>	--
16.6	SF (per	--	--	--	--	--
16.7	mg/kg-day)					
16.8	ADAF or	--	--	--	--	--
16.9	AF_{lifetime}					
16.10	Intake Rate	0.043 <u>--</u>	0.043 <u>0.038</u>	0.077 <u>(2)</u>	0.043 <u>(2)</u>	--
16.11	(L/kg-day)					
16.12	Endpoints	developmental	developmental	developmental,	developmental,	--
16.13		--		renal (kidney)	<u>male</u>	
16.14			system	system,	<u>reproductive</u>	
16.15				renal	<u>system,</u>	
16.16				(kidney) system	(kidney) system	

16.17 Subp. ~~12d~~ 12e. **Fluoranthene.**

16.18 CAS number: 206-44-0

16.19 Year Adopted: 2018

16.20 Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer	
16.21						
16.22	HRL (µg/L)	ND	ND	200	70	NA
16.23	RfD	--	--	0.053	0.016	--
16.24	(mg/kg-day)					
16.25	RSC	--	--	0.2	0.2	--
16.26	SF (per	--	--	--	--	--
16.27	mg/kg-day)					
16.28	ADAF or	--	--	--	--	--
16.29	AF_{lifetime}					

17.1	Intake Rate (L/kg-day)	--	--	0.070	0.044	--
17.2						
17.3	Endpoints	--	--	hepatic (liver)	hepatic (liver)	--
17.4				system, renal	system, renal	
17.5				(kidney) system	(kidney) system	

17.6 Subp. 12f. Fluorene (9H-Fluorene).

17.7 CAS number: 86-73-7

17.8 Year Adopted: 2023

17.9 Volatility: Moderate

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
17.10						
17.11	<u>HRL (µg/L)</u>	<u>ND</u>	<u>ND</u>	<u>200</u>	<u>80</u>	<u>NA</u>
17.12	<u>RfD</u>	--	--	<u>0.058</u>	<u>0.018</u>	--
17.13	<u>(mg/kg-day)</u>					
17.14	<u>RSC</u>	--	--	<u>0.2</u>	<u>0.2</u>	--
17.15	<u>SF (per</u>	--	--	--	--	--
17.16	<u>mg/kg-day)</u>					
17.17	<u>ADAF or</u>	--	--	--	--	--
17.18	<u>AF_{lifetime}</u>					
17.19	<u>Intake Rate</u>	--	--	<u>0.074</u>	<u>0.045</u>	--
17.20	<u>(L/kg-day)</u>					
17.21	<u>Endpoints</u>	--	--	<u>hematological</u>	<u>hematological</u>	--
17.22				<u>(blood)</u>	<u>(blood)</u>	
17.23				<u>system, spleen</u>	<u>system,</u>	
17.24					<u>spleen</u>	

17.25 Subp. 12g. Fomesafen.

17.26 CAS number: 72178-02-0

17.27 Year Adopted: 2023

17.28 Volatility: Nonvolatile

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
17.29						
17.30	<u>HRL (µg/L)</u>	<u>ND</u>	<u>200</u>	<u>200 (2)</u>	<u>20</u>	<u>NA</u>

18.1	<u>RfD</u>	--	<u>0.12</u>	<u>(2)</u>	<u>0.005</u>	--
18.2	<u>(mg/kg-day)</u>					
18.3	<u>RSC</u>	--	<u>0.5</u>	<u>(2)</u>	<u>0.2</u>	--
18.4	<u>SF (per</u>	--	--	--	--	--
18.5	<u>mg/kg-day)</u>					
18.6	<u>ADAF or</u>	--	--	--	--	--
18.7	<u>AF_{lifetime}</u>					
18.8	<u>Intake Rate</u>	--	<u>0.290</u>	<u>(2)</u>	<u>0.045</u>	--
18.9	<u>(L/kg-day)</u>					
18.10	<u>Endpoints</u>	--	<u>developmental,</u>	<u>developmental,</u>	<u>hepatic</u>	--
18.11			<u>hepatic (liver)</u>	<u>hepatic (liver)</u>	<u>(liver) system</u>	
18.12			<u>system, immune</u>	<u>system,</u>		
18.13			<u>system</u>	<u>immune</u>		
18.14				<u>system</u>		

18.15 Subp. 12h. **Imidacloprid.**

18.16 CAS number: 138261-41-3

18.17 Year Adopted: 2023

18.18 Volatility: Nonvolatile

18.19		<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
18.20	<u>HRL (µg/L)</u>	<u>100</u>	<u>2</u>	<u>2 (2)</u>	<u>2 (2)</u>	<u>NA</u>
18.21	<u>RfD</u>	<u>0.15</u>	<u>0.0036</u>	<u>(2)</u>	<u>(2)</u>	--
18.22	<u>(mg/kg-day)</u>					
18.23	<u>RSC</u>	<u>0.2</u>	<u>0.2</u>	<u>(2)</u>	<u>(2)</u>	--
18.24	<u>SF (per</u>	--	--	--	--	--
18.25	<u>mg/kg-day)</u>					
18.26	<u>ADAF or</u>	--	--	--	--	--
18.27	<u>AF_{lifetime}</u>					
18.28	<u>Intake Rate</u>	<u>0.290</u>	<u>0.290</u>	<u>(2)</u>	<u>(2)</u>	--
18.29	<u>(L/kg-day)</u>					
18.30	<u>Endpoints</u>	<u>nervous system</u>	<u>immune system</u>	<u>immune</u>	<u>immune</u>	--
18.31				<u>system</u>	<u>system</u>	

19.1 Subp. 12i. Manganese.19.2 CAS number: 7439-96-519.3 Year Adopted: 202319.4 Volatility: Nonvolatile

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
19.5					
19.6	<u>HRL (µg/L)</u>	<u>ND</u>	<u>100</u>	<u>ND</u>	<u>NA</u>
19.7	<u>RfD</u>	<u>--</u>	<u>0.083</u>	<u>--</u>	<u>--</u>
19.8	<u>(mg/kg-day)</u>				
19.9	<u>RSC</u>	<u>--</u>	<u>0.5</u>	<u>--</u>	<u>--</u>
19.10	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
19.11	<u>mg/kg-day)</u>				
19.12	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
19.13	<u>AF_{lifetime}</u>				
19.14	<u>Intake Rate</u>	<u>--</u>	<u>0.290</u>	<u>--</u>	<u>--</u>
19.15	<u>(L/kg-day)</u>				
19.16	<u>Endpoints</u>	<u>--</u>	<u>developmental,</u>	<u>--</u>	<u>--</u>
19.17			<u>nervous system</u>		

19.18 Subp. ~~12e~~ 12j. Metolachlor and S-Metolachlor.19.19 CAS number: 51218-45-2; 87392-12-919.20 Year Adopted: ~~2011~~ 202319.21 Volatility: Nonvolatile

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
19.22						
19.23	<u>HRL (µg/L)</u>	<u>400 ND</u>	<u>400 300</u>	<u>300 (2)</u>	<u>300 (3) (2)</u>	<u>NA</u>
19.24	<u>RfD</u>	<u>0.24 --</u>	<u>0.24 0.19</u>	<u>0.097 (2)</u>	<u>(3) (2)</u>	<u>--</u>
19.25	<u>(mg/kg-day)</u>					
19.26	<u>RSC</u>	<u>0.5 --</u>	<u>0.5</u>	<u>0.2 (2)</u>	<u>(3) (2)</u>	<u>--</u>
19.27	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
19.28	<u>mg/kg-day)</u>					

20.1	ADAF or	--	--	--	--	--
20.2	AF_{lifetime}					
20.3	Intake Rate	0.289 --	0.289 <u>0.290</u>	0.077 (2)	(3) (2)	--
20.4	(L/kg-day)					
20.5	Endpoints	developmental --	developmental	none	none	--
20.6				<u>developmental</u>	<u>developmental</u>	

20.7 Subp. ~~12f~~ 12k. **Metolachlor ESA.**

20.8 CAS number: 171118-09-5

20.9 Year Adopted: ~~2011~~ 2023

20.10 Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer	
20.11						
20.12	HRL (µg/L)	ND	ND	4,000 <u>7,000</u>	800 <u>1,000</u>	NA
20.13	RfD	--	--	1.7 <u>2.7</u>	0.17 <u>0.27</u>	--
20.14	(mg/kg-day)					
20.15	RSC	--	--	0.2	0.2	--
20.16	SF (per	--	--	--	--	--
20.17	mg/kg-day)					
20.18	ADAF or	--	--	--	--	--
20.19	AF_{lifetime}					
20.20	Intake Rate	--	--	0.077 <u>0.074</u>	0.043 <u>0.045</u>	--
20.21	(L/kg-day)					
20.22	Endpoints	--	--	hepatic (liver)	hepatic (liver)	--
20.23				system	system	

20.24 Subp. ~~12g~~ 12l. **Metolachlor OXA.**

20.25 CAS number: 152019-73-3

20.26 Year Adopted: ~~2011~~ 2023

20.27 Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer	
21.1						
21.2	HRL (µg/L)	ND	3,000 <u>5,000</u>	3,000 <u>5,000</u>	800 <u>1,000</u>	NA
21.3			(2)			
21.4	RfD	--	1.7 <u>2.7</u>	0.17 <u>0.27</u>	--	
21.5	(mg/kg-day)		(2)			
21.6	RSC	--	0.5	0.2	--	
21.7	SF (per	--	--	--	--	
21.8	mg/kg-day)					
21.9	ADAF or	--	--	--	--	
21.10	AF_{lifetime}					
21.11	Intake Rate	--	0.289 <u>0.290</u>	(2)	0.043 <u>0.045</u>	--
21.12	(L/kg-day)					
21.13	Endpoints	--	none	none	none	--

21.14 Subp. ~~12h~~ 12m. **Metribuzin.**

21.15 CAS number: 21087-64-9

21.16 Year Adopted: 2013

21.17 Volatility: Low

	Acute	Short-term	Subchronic	Chronic	Cancer	
21.18						
21.19	HRL (µg/L)	30	10	10 (2)	10 (2)	NA
21.20	RfD	0.016	0.006	(2)	(2)	--
21.21	(mg/kg-day)					
21.22	RSC	0.5	0.5	(2)	(2)	--
21.23	SF (per	--	--	--	--	--
21.24	mg/kg-day)					
21.25	ADAF or	--	--	--	--	--
21.26	AF_{lifetime}					
21.27	Intake Rate	0.289	0.289	(2)	(2)	--
21.28	(L/kg-day)					
21.29	Endpoints	developmental, nervous system	thyroid (E)	thyroid (E)	thyroid (E)	--
21.30						

22.1 Subp. ~~12i~~ 12n. **Naphthalene.**

22.2 CAS number: 91-20-3

22.3 Year Adopted: 2013

22.4 Volatility: Moderate

	Acute	Short-term	Subchronic	Chronic	Cancer	
22.5 22.6	HRL (µg/L)	70	70	70 (2)	70	NA
22.7 22.8	RfD (mg/kg-day)	0.038	0.038	(2)	0.016	--
22.9	RSC	0.5	0.5	(2)	0.2	--
22.10 22.11	SF (per mg/kg-day)	--	--	--	--	--
22.12 22.13	ADAF or AF_{lifetime}	--	--	--	--	--
22.14 22.15	Intake Rate (L/kg-day)	0.289	0.289	(2)	0.043	--
22.16 22.17	Endpoints	nervous system	nervous system	nervous system	nervous system, spleen	--

22.18 *[For text of subpart 13, see Minnesota Rules]*22.19 Subp. 13a. **p-Nonylphenol (4-Nonylphenol).**

22.20 CAS number: 84852-15-3

22.21 Year Adopted: 2023

22.22 Volatility: Low

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
22.23 22.24	<u>HRL (µg/L)</u>	<u>ND</u>	<u>100</u>	<u>40</u>	<u>20</u>	<u>NA</u>
22.25 22.26	<u>RfD (mg/kg-day)</u>	--	<u>0.21</u>	<u>0.016</u>	<u>0.0049</u>	--
22.27	<u>RSC</u>	--	<u>0.2</u>	<u>0.2</u>	<u>0.2</u>	--
22.28 22.29	<u>SF (per mg/kg-day)</u>	--	--	--	--	--

23.1	<u>ADAF or</u>	==	==	==	==	==
23.2	<u>AF_{lifetime}</u>					
23.3	<u>Intake Rate</u>	==	<u>0.290</u>	<u>0.074</u>	<u>0.045</u>	==
23.4	<u>(L/kg-day)</u>					
23.5	<u>Endpoints</u>	==	<u>developmental,</u>	<u>renal (kidney)</u>	<u>renal (kidney)</u>	==
23.6			<u>female</u>	<u>system</u>	<u>system</u>	
23.7			<u>reproductive</u>			
23.8			<u>system</u>			

23.9 **Subp. 13b. 4-tert-Octylphenol.**

23.10 CAS number: 140-66-9

23.11 Year Adopted: 2023

23.12 Volatility: Low

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
23.13						
23.14	<u>HRL (µg/L)</u>	<u>ND</u>	<u>100</u>	<u>100 (2)</u>	<u>100 (2)</u>	<u>NA</u>
23.15	<u>RfD</u>	==	<u>0.17</u>	<u>(2)</u>	<u>(2)</u>	==
23.16	<u>(mg/kg-day)</u>					
23.17	<u>RSC</u>	==	<u>0.2</u>	<u>(2)</u>	<u>(2)</u>	==
23.18	<u>SF (per</u>	==	==	==	==	==
23.19	<u>mg/kg-day)</u>					
23.20	<u>ADAF or</u>	==	==	==	==	==
23.21	<u>AF_{lifetime}</u>					
23.22	<u>Intake Rate</u>	==	<u>0.290</u>	<u>(2)</u>	<u>(2)</u>	==
23.23	<u>(L/kg-day)</u>					
23.24	<u>Endpoints</u>	==	<u>developmental</u>	<u>developmental</u>	<u>developmental</u>	==

23.25 *[For text of subpart 14, see Minnesota Rules]*

23.26 **Subp. 14a. Perfluorobutane sulfonate (PFBS).**

23.27 CAS number: 45187-15-3; 375-73-5; 29420-49-3; 68259-10-9; 60453-92-1

23.28 Year Adopted: ~~2011~~ 2023

23.29 Volatility: Nonvolatile

	Acute	Short-term	Subchronic	Chronic	Cancer	
24.1						
24.2	HRL (µg/L)	ND	ND <u>0.1</u>	9 <u>0.1 (2)</u>	7 <u>0.1 (2)</u>	NA
24.3	RfD	--	-- <u>0.000084</u>	0.0042 <u>(2)</u>	0.0014 <u>(2)</u>	--
24.4	(mg/kg-day)					
24.5	RSC	--	-- <u>0.5</u>	0.5 <u>(2)</u>	0.2 <u>(2)</u>	--
24.6	SF (per	--	--	--	--	--
24.7	mg/kg-day)					
24.8	ADAF or	--	--	--	--	--
24.9	AF_{lifetime}					
24.10	Intake Rate	--	-- <u>0.290</u>	0.245 <u>(2)</u>	0.043 <u>(2)</u>	--
24.11	(L/kg-day)					
24.12	Endpoints	--	-- <u>thyroid (E)</u>	hepatic (liver) system; hematological (blood) system; renal (kidney) system <u>thyroid</u> <u>(E)</u>	hepatic (liver) system; hematological (blood) system; renal (kidney) system <u>thyroid</u> <u>(E)</u>	--
24.13						
24.14						
24.15						
24.16						
24.17						
24.18						

24.19 *[For text of subpart 14b, see Minnesota Rules]*

24.20 Subp. 14c. Perfluorohexane sulfonate (PFHxS) and salts.

24.21 CAS number: 108427-53-8; 355-46-4; 3871-99-6

24.22 Year Adopted: 2023

24.23 Volatility: Moderate

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
24.24					
24.25	<u>HRL (µg/L)</u>	<u>NA</u>	<u>0.047</u>	<u>0.047</u>	<u>NA</u>
24.26	<u>RfD</u>	--	<u>0.0000097</u>	<u>0.0000097</u>	--
24.27	<u>(mg/kg-day)</u>				
24.28	<u>RSC</u>	--	<u>0.5</u>	--	--
24.29	<u>SF (per</u>	--	--	--	--
24.30	<u>mg/kg-day)</u>				
24.31	<u>ADAF or</u>	--	--	--	--
24.32	<u>AF_{lifetime}</u>				

25.1	<u>Intake Rate</u>	--	*	*	*	--
25.2	<u>(L/kg-day)</u>					
25.3	<u>Endpoints</u>	--	<u>hepatic (liver)</u>	<u>hepatic (liver)</u>	<u>hepatic (liver)</u>	--
25.4			<u>system, thyroid</u>	<u>system, thyroid</u>	<u>system, thyroid</u>	
25.5			<u>(E)</u>	<u>(E)</u>	<u>(E)</u>	

25.6 * 95th percentile water intake rates (Tables 3-1, 3-3, and 3-5 Environmental Protection
 25.7 Agency, Exposure Factors Handbook, 2019) or upper percentile breast milk intake rates
 25.8 (Table 15-1, Environmental Protection Agency, Exposure Factors Handbook, 2011), and
 25.9 MDH background information.

25.10 Subp. 14d. **Perfluorohexanoate (PFHxA) and salts.**

25.11 CAS number: 92912-52-7; 307-24-4; 21615-47-4; 2923-26-4

25.12 Year Adopted: 2023

25.13 Volatility: Nonvolatile

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
25.14						
25.15	<u>HRL (µg/L)</u>	<u>ND</u>	<u>0.2</u>	<u>0.2 (2)</u>	<u>0.2 (2)</u>	<u>NA</u>
25.16	<u>RfD</u>	--	<u>0.00032</u>	<u>(2)</u>	<u>(2)</u>	--
25.17	<u>(mg/kg-day)</u>					
25.18	<u>RSC</u>	--	<u>0.2</u>	<u>(2)</u>	<u>(2)</u>	--
25.19	<u>SF (per</u>	--	--	--	--	--
25.20	<u>mg/kg-day)</u>					
25.21	<u>ADAF or</u>	--	--	--	--	--
25.22	<u>AF_{lifetime}</u>					
25.23	<u>Intake Rate</u>	--	<u>0.290</u>	<u>(2)</u>	<u>(2)</u>	--
25.24	<u>(L/kg-day)</u>					
25.25	<u>Endpoints</u>	--	<u>developmental,</u>	<u>developmental,</u>	<u>developmental,</u>	--
25.26			<u>thyroid (E)</u>	<u>thyroid (E)</u>	<u>thyroid (E)</u>	

25.27 [For text of subparts 15 to 16a, see Minnesota Rules]

26.1 Subp. 16b. Quinoline.26.2 CAS number: 91-22-526.3 Year Adopted: 202326.4 Volatility: Low

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
26.5					
26.6	<u>HRL (µg/L)</u>	<u>ND</u>	<u>ND</u>	<u>4</u>	<u>0.03</u>
26.7	<u>RfD</u>	<u>==</u>	<u>==</u>	<u>0.00079</u>	<u>==</u>
26.8	<u>(mg/kg-day)</u>				
26.9	<u>RSC</u>	<u>==</u>	<u>==</u>	<u>0.2</u>	<u>==</u>
26.10	<u>SF (per</u>	<u>==</u>	<u>==</u>	<u>==</u>	<u>3</u>
26.11	<u>mg/kg-day)</u>				
26.12	<u>ADAF or</u>	<u>==</u>	<u>==</u>	<u>==</u>	<u>10 (ADAF_{<2})</u>
26.13	<u>AF_{lifetime}</u>				<u>3 (ADAF_{2 to <16})</u>
26.14					<u>1 (ADAF₁₆₊)</u>
26.15					
26.16	<u>Intake Rate</u>	<u>==</u>	<u>==</u>	<u>0.045</u>	<u>0.155 (<2)</u>
26.17	<u>(L/kg-day)</u>				<u>0.040 (2 to <16)</u>
26.18					<u>0.042 (16+)</u>
26.19	<u>Endpoints</u>	<u>==</u>	<u>==</u>	<u>==</u>	<u>cancer</u>
26.20				<u>hematological</u>	
26.21				<u>(blood)</u>	
26.22				<u>system,</u>	
26.23				<u>hepatic (liver)</u>	
26.24				<u>system, renal</u>	
26.25				<u>(kidney)</u>	
26.26				<u>system,</u>	
26.27				<u>respiratory</u>	
26.28				<u>system, and</u>	
				<u>spleen</u>	

26.29 [For text of subparts 17 and 17a, see Minnesota Rules]

27.1 Subp. 18. ~~1,1,2,2-Tetrachloroethylene~~ (PCE or PERC).

27.2 CAS number: 127-18-4

27.3 Year Adopted: ~~2009~~ 2023

27.4 Volatility: High

27.5 ~~MCL-based HRL: 5 µg/L~~

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
27.6					
27.7	<u>HRL (µg/L)</u>	<u>ND</u>	<u>ND</u>	<u>7</u>	<u>7 (3)</u>
27.8	<u>RfD</u>	<u>--</u>	<u>--</u>	<u>0.0026</u>	<u>(3)</u>
27.9	<u>(mg/kg-day)</u>				<u>--</u>
27.10	<u>RSC</u>	<u>--</u>	<u>--</u>	<u>0.2</u>	<u>(3)</u>
27.11	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
27.12	<u>mg/kg-day)</u>				<u>0.0249</u>
27.13	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>10</u>
27.14	<u>AF_{lifetime}</u>				<u>(ADAF₂)</u>
27.15					<u>3</u>
27.16					<u>(ADAF₂</u>
27.17					<u>to <16)</u>
27.18					<u>1</u>
27.19					<u>(ADAF₁₆₊)</u>
27.20	<u>Intake Rate</u>	<u>--</u>	<u>--</u>	<u>0.074</u>	<u>(3)</u>
27.21	<u>(L/kg-day)</u>				<u>0.155 (<2)</u>
27.22					<u>0.040 (2 to</u>
27.23					<u>≤16)</u>
27.24					<u>0.042</u>
27.25					<u>(16+)</u>
27.25	<u>Endpoints</u>	<u>--</u>	<u>--</u>	<u>nervous system</u>	<u>nervous system</u>
					<u>cancer</u>

27.26 *[For text of subparts 18a and 18b, see Minnesota Rules]*27.27 Subp. 18c. **Toluene.**

27.28 CAS number: 108-88-3

27.29 Year Adopted: ~~2011~~ 2023

27.30 Volatility: High

	Acute	Short-term	Subchronic	Chronic	Cancer	
28.1						
28.2	HRL (µg/L)	ND	200 <u>70</u>	200 (2) <u>70 (2)</u>	200 (2) <u>70 (2)</u>	NA
28.3	RfD	--	0.22 <u>0.10</u>	(2)	(2)	--
28.4	(mg/kg-day)					
28.5	RSC	--	0.2	(2)	(2)	--
28.6	SF (per	--	--	--	--	--
28.7	mg/kg-day)					
28.8	ADAF or	--	--	--	--	--
28.9	AF_{lifetime}					
28.10	Intake Rate	--	0.289 <u>0.290</u>	(2)	(2)	--
28.11	(L/kg-day)					
28.12	Endpoints	--	immune system,	immune system,	immune system,	--
28.13			nervous system	nervous system	nervous system	

28.14 *[For text of subparts 18d to 21a, see Minnesota Rules]*

28.15 Subp. 21b. 1,2,3-Trimethylbenzene.

28.16 CAS number: 526-73-8

28.17 Year Adopted: 2023

28.18 Volatility: High

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
28.19						
28.20	<u>HRL (µg/L)</u>	<u>ND</u>	<u>30</u>	<u>30 (2)</u>	<u>30 (2)</u>	<u>NA</u>
28.21	<u>RfD</u>	--	<u>0.042</u>	<u>(2)</u>	<u>(2)</u>	--
28.22	<u>(mg/kg-day)</u>					
28.23	<u>RSC</u>	--	<u>0.2</u>	<u>(2)</u>	<u>(2)</u>	--
28.24	<u>SF (per</u>	--	--	--	--	--
28.25	<u>mg/kg-day)</u>					
28.26	<u>ADAF or</u>	--	--	--	--	--
28.27	<u>AF_{lifetime}</u>					
28.28	<u>Intake Rate</u>	--	<u>0.290</u>	<u>(2)</u>	<u>(2)</u>	--
28.29	<u>(L/kg-day)</u>					
28.30	<u>Endpoints</u>	--	<u>nervous system</u>	<u>nervous system</u>	<u>nervous system</u>	--

29.1 Subp. 21c. 1,2,4-Trimethylbenzene.29.2 CAS number: 95-63-629.3 Year Adopted: 202329.4 Volatility: High

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
29.5						
29.6	<u>HRL (µg/L)</u>	<u>ND</u>	<u>30</u>	<u>30 (2)</u>	<u>30 (2)</u>	<u>NA</u>
29.7	<u>RfD</u>	<u>--</u>	<u>0.042</u>	<u>(2)</u>	<u>(2)</u>	<u>--</u>
29.8	<u>(mg/kg-day)</u>					
29.9	<u>RSC</u>	<u>--</u>	<u>0.2</u>	<u>(2)</u>	<u>(2)</u>	<u>--</u>
29.10	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
29.11	<u>mg/kg-day)</u>					
29.12	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
29.13	<u>AF_{lifetime}</u>					
29.14	<u>Intake Rate</u>	<u>--</u>	<u>0.290</u>	<u>(2)</u>	<u>(2)</u>	<u>--</u>
29.15	<u>(L/kg-day)</u>					
29.16	<u>Endpoints</u>	<u>--</u>	<u>nervous system</u>	<u>nervous system</u>	<u>nervous system</u>	<u>--</u>

29.17 Subp. 22. 1,3,5-Trimethylbenzene.29.18 CAS number: 108-67-829.19 Year Adopted: ~~2009~~ 202329.20 Volatility: High

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
29.21						
29.22	<u>HRL (µg/L)</u>	<u>ND</u>	100 <u>30</u>	100 (2) <u>30 (2)</u>	100 (2) <u>30 (2)</u>	<u>NA</u>
29.23	<u>RfD</u>	ND <u>--</u>	0.14 <u>0.042</u>	<u>(2)</u>	<u>(2)</u>	<u>--</u>
29.24	<u>(mg/kg-day)</u>					
29.25	<u>RSC</u>	<u>--</u>	<u>0.2</u>	<u>(2)</u>	<u>(2)</u>	<u>--</u>
29.26	<u>SF (per</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
29.27	<u>mg/kg-day)</u>					
29.28	<u>ADAF or</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
29.29	<u>AF_{lifetime}</u>					

30.1	Intake Rate	--	0.289 <u>0.290</u>	(2)	(2)	--
30.2	(L/kg-day)					
30.3	Endpoints	--	hepatic (liver) system nervous system	hepatic (liver) system, renal (kidney) system nervous system	hepatic (liver) system, renal (kidney) system nervous system	--
30.4						
30.5						
30.6						
30.7						
30.8						

30.9 Subp. 22a. Tris(1,3-dichloro-2-propyl) phosphate (TDCPP)

30.10 CAS number: 13674-87-8

30.11 Year Adopted: 2023

30.12 Volatility: Nonvolatile

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
30.13						
30.14	<u>HRL (µg/L)</u>	<u>ND</u>	<u>ND</u>	<u>20</u>	<u>0.8</u>	
30.15	<u>RfD</u>	--	--	<u>0.0067</u>	<u>0.0019</u>	--
30.16	<u>(mg/kg-day)</u>					
30.17	<u>RSC</u>	--	--	<u>0.2</u>	<u>0.2</u>	--
30.18	<u>SF (per</u>	--	--	--	--	<u>0.13</u>
30.19	<u>mg/kg-day)</u>					
30.20	<u>ADAF or</u>	--	--	--	--	<u>10</u>
30.21	<u>AF_{lifetime}</u>					<u>(ADAF₂)</u>
30.22						<u>3</u>
30.23						<u>(ADAF₂</u>
30.24						<u>to <16)</u>
30.25						<u>1</u>
30.26						<u>(ADAF₁₆₊)</u>
30.27	<u>Intake Rate</u>	--	--	<u>0.074</u>	<u>0.045</u>	<u>0.155_(≤2)</u>
30.28	<u>(L/kg-day)</u>					<u>0.040_{(2 to}</u>
30.29						<u>≤16)</u>
30.30						<u>0.042</u>
30.31						<u>(16+)</u>
30.32	<u>Endpoints</u>	--	--	hepatic (liver) system; kidney system	male reproductive system; renal (kidney) system	<u>cancer</u>
30.33						
30.34						
30.35						

31.1 Subp. 22b. Tris(2-butoxyethyl) phosphate (TBEP)31.2 CAS number: 78-51-331.3 Year Adopted: 202331.4 Volatility: Nonvolatile

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
31.5 31.6	<u>HRL (µg/L)</u>	<u>ND</u>	<u>30</u>	<u>30 (2)</u>	<u>30</u>	<u>NA</u>
31.7 31.8	<u>RfD (mg/kg-day)</u>	<u>--</u>	<u>0.043</u>	<u>(2)</u>	<u>0.0074</u>	<u>--</u>
31.9	<u>RSC</u>	<u>--</u>	<u>0.2</u>	<u>(2)</u>	<u>0.2</u>	<u>--</u>
31.10 31.11	<u>SF (per mg/kg-day)</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
31.12 31.13	<u>ADAF or AF_{lifetime}</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>
31.14 31.15	<u>Intake Rate (L/kg-day)</u>	<u>--</u>	<u>0.290</u>	<u>(2)</u>	<u>0.045</u>	<u>--</u>
31.16 31.17	<u>Endpoints</u>	<u>--</u>	<u>hepatic (liver) system</u>	<u>hepatic (liver) system</u>	<u>hepatic (liver) system</u>	<u>--</u>

31.18 Subp. ~~22a~~ 22c. Tris(2-chloroethyl) phosphate.31.19 CAS number: 115-96-831.20 Year Adopted: 201331.21 Volatility: Low

	<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>	
31.22 31.23	<u>HRL (µg/L)</u>	<u>ND</u>	<u>300</u>	<u>200</u>	<u>200 (3)</u>	<u>5</u>
31.24 31.25	<u>RfD (mg/kg-day)</u>	<u>--</u>	<u>0.15</u>	<u>0.068</u>	<u>(3)</u>	<u>--</u>
31.26	<u>RSC</u>	<u>--</u>	<u>0.5</u>	<u>0.2</u>	<u>(3)</u>	<u>--</u>
31.27 31.28	<u>SF (per mg/kg-day)</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>0.02</u>

32.1	ADAF or AF_{lifetime}	--	--	--	--	10 (ADAF _{<2})
32.2						
32.3						3 (ADAF _{2 to <16})
32.4						1 (ADAF ₁₆₊)
32.5	Intake Rate (L/kg-day)	--	0.289	0.077	(3)	0.137 (<2)
32.6						0.047 (2 to <16)
32.7						0.039 (16+)
32.8	Endpoints	--	renal (kidney) system, nervous system, develop- mental	renal (kidney) system	renal (kidney) system	cancer
32.9						
32.10						
32.11						
32.12						
32.13						

32.14 Subp. 22d. Venlafaxine.32.15 CAS number: 93413-69-5 (free base), 93300-78-4 (HCl salt)32.16 Year Adopted: 202332.17 Volatility: Nonvolatile

32.18		<u>Acute</u>	<u>Short-term</u>	<u>Subchronic</u>	<u>Chronic</u>	<u>Cancer</u>
32.19	<u>HRL (µg/L)</u>	<u>ND</u>	<u>10</u>	<u>10 (2)</u>	<u>10 (2)</u>	<u>NA</u>
32.20	<u>RfD (mg/kg-day)</u>	--	<u>0.0054</u>	<u>(2)</u>	<u>(2)</u>	--
32.21						
32.22	<u>RSC</u>	--	<u>0.8</u>	<u>(2)</u>	<u>(2)</u>	--
32.23	<u>SF (per mg/kg-day)</u>	--	--	--	--	--
32.24						
32.25	<u>ADAF or AF_{lifetime}</u>	--	--	--	--	--
32.26						
32.27	<u>Intake Rate (L/kg-day)</u>	--	<u>0.290</u>	<u>(2)</u>	<u>(2)</u>	--
32.28						
32.29	<u>Endpoints</u>	--	<u>developmental, gastrointestinal system, male reproductive</u>	<u>developmental, gastrointestinal system, male reproductive</u>	<u>developmental, gastrointestinal system, male reproductive</u>	--
32.30						
32.31						
32.32						

33.1		<u>system, nervous</u>	<u>system, nervous</u>	<u>system, nervous</u>	
33.2		<u>system (E)</u>	<u>system (E)</u>	<u>system (E)</u>	

33.3 *[For text of subpart 23, see Minnesota Rules]*

33.4 Subp. 23a. **Xylenes.**

33.5 CAS number: 1330-20-7

33.6 Year Adopted: ~~2011~~ 2023

33.7 Volatility: High

33.8		Acute	Short-term	Subchronic	Chronic	Cancer
33.9	HRL (µg/L)	800 <u>700</u>	300	300 (2)	300 (2) <u>300</u> <u>(3)</u>	NA
33.10						
33.11	RfD	1.2 <u>1.0</u>	0.5 <u>0.38</u>	(2) <u>0.12</u>	(2) <u>(3)</u>	--
33.12	(mg/kg-day)					
33.13	RSC	0.2	0.2	(2) <u>0.2</u>	(2) <u>(3)</u>	--
33.14	SF (per	--	--	--	--	--
33.15	mg/kg-day)					
33.16	ADAF or	--	--	--	--	--
33.17	AF_{lifetime}					
33.18	Intake Rate	0.289 <u>0.290</u>	0.289 <u>0.290</u>	(2) <u>0.074</u>	(2) <u>(3)</u>	--
33.19	(L/kg-day)					
33.20	Endpoints	nervous system	<u>developmental,</u> nervous system	<u>developmental,</u> renal (kidney) system, nervous system	<u>developmental,</u> renal (kidney) system, nervous system	--
33.21						
33.22						
33.23						
33.24						
33.25						

33.26 *[For text of subpart 24, see Minnesota Rules]*

33.27 **REPEALER.** Minnesota Rules, parts 4717.7500, subparts 11, 15, 34a, 45a, 54, 58a, and

33.28 61; and 4717.7850, subpart 2, item E, are repealed.