

Triennial Review of Water Quality Standards

- TR13 -

Water Resources Advisory Committee

December 16, 2011



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Objectives for today's Special Meeting

- Highlights of TR13 Triennial Review
- Review Proposed changes in Draft Annex
- WRAC to take action at Jan. 11, 2012 mtg
- Projected Timeline for TR13 Rlmkg

The Department routinely re-evaluates, as part of each triennial review, the two water bodies where the fishable or swimmable uses specified in Section 101(a)(2) of the federal Clean Water Act uses are not being met in Pennsylvania:

- the Harbor Basin and entrance channel to Outer Erie Harbor/ Presque Isle Bay (§93.9x)

and

- several zones in Delaware Estuary (§§93.9e & 93.9g)

Because the same conditions and hazards exist today as during the original use attainability assessments (UAA), no change to the designated use is anticipated for these waters.

Review of Draft Annex

- All changes indicated in **bold blue text**
Using LRB rules to indicate amendments to Code:
 - [] = text being deleted
 - _____ = text being added
- **Text in red type** indicates a change to the Annex you received

ANNEX A

TITLE 25. ENVIRONMENTAL PROTECTION
PART I. DEPARTMENT OF ENVIRONMENTAL PROTECTION
Subpart C. PROTECTION OF NATURAL RESOURCES
ARTICLE II. WATER RESOURCES

CHAPTER 93. WATER QUALITY STANDARDS

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GENERAL PROVISIONS

§ 93.1. Definitions.

The following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise:

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[Critical use—The most sensitive designated or existing use the criteria are designed to protect.]

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Point source discharge—A pollutant source regulated under the National Pollutant Discharge Elimination System (NPDES) as defined in § [\[92.1\]](#) [92a.2](#) (relating to definitions).

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ANTIDEGRADATION REQUIREMENTS

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§ 93.4c. Implementation of antidegradation requirements.

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(b) *Protection of High Quality and Exceptional Value Waters*

(1) *Point source discharges.* The following applies to point source discharges to High Quality or Exceptional Value Waters.

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(ii) *Public participation requirements for discharges to High Quality or Exceptional Value Waters.* The following requirements apply to discharges to High Quality or Exceptional Value Waters, as applicable:

(A) The Department will hold a public hearing on a proposed new, additional or increased discharge to Exceptional Value Waters when requested by an interested person on or before the termination of the public comment period on the discharge.

(B) For new or increased point source discharges, in addition to the public participation requirements in §§ [\[92.61, 92.63 and 92.65\]](#) [92a.81, 92a.82, 92a.83, 92a.85](#) (relating to public notice of permit application and public hearing; public access to information; and notice to other government agencies), the applicant shall identify the antidegradation classification of the receiving water in the notice of complete application in § [\[92.61\(a\)\] 92a.86 \(relating to notice of issuance or final action on a permit\)](#).

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(c) *Special provisions for sewage facilities in High Quality or Exceptional Value Waters.*

(1) *SEJ approval in sewage facilities planning and approval in High Quality Waters.* A proponent of a new, additional, or increased sewage discharge in High Quality Waters shall include an SEJ impact analysis as part of the proposed revision or update to the official municipal sewage facilities plan under Chapter 71 (relating to administration of sewage facilities planning program). The Department will make a determination regarding the consistency of the SEJ impact analysis with subsection (b)(1)(iii). The determination will constitute the subsection (b)(1)(iii) analysis at the National Pollutant Discharge Elimination System (NPDES) permit review stage under Chapter 92a (relating to National Pollutant Discharge Elimination System permitting, monitoring and compliance), unless there is a material change in the project or law between sewage facilities planning and NPDES permitting, in which case the proponent shall recommence sewage facilities planning and perform a new social or economic justification impact analysis.

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§ 93.4d. Processing of petitions, evaluations and assessments to change a designated use.

(a) *Public notice of receipt of [evaluation] petition, or assessment of waters, for High Quality or Exceptional Value Waters redesignation.* The Department will publish in the *Pennsylvania Bulletin* and [in a local newspaper of general circulation] by other means designed to effectively reach a wide audience, notice of receipt of a complete [evaluation] petition which has been accepted by the EQB recommending a High Quality or Exceptional Value Waters redesignation, or notice of the Department's intent to assess surface waters for potential redesignation as High Quality or Exceptional Value Waters. The assessments may be undertaken in response to a petition or on the Department's own initiative. The notice will request submission of information concerning the water quality of the waters subject to the evaluation, or to be assessed, for use by the Department to supplement any studies which have been performed. The Department will send a copy of the notice to all municipalities containing waters subject to the [evaluation] petition or assessment.

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§ 93.7. Specific water quality criteria.

(a) Table 3 displays specific water quality criteria and associated critical uses. The criteria associated with the Statewide water uses listed in § 93.4, Table 2 apply to all surface waters, unless a specific exception is indicated in § § 93.9a—93.9z. These exceptions will be indicated on a stream-by-stream or segment-by-segment basis by the words “Add” or “Delete” followed by the appropriate symbols described elsewhere in this chapter. Other specific water quality criteria apply to surface waters as specified in § § 93.9a—93.9z. All applicable criteria shall be applied in accordance with this chapter, Chapter 96 (relating to water quality standards implementation) and other applicable State and Federal laws and regulations

TABLE 3

Parameter	Symbol	Criteria	Critical Use*
		* * * * *	
Chloride	Ch ₁	Maximum 250 mg/L	PWS
	<u>Ch₂</u>	<u>Shall not exceed the concentration calculated (in mg/L) by the following equations:</u>	<u>CWF, WWF, TSE, MF</u>
		<u>1-hour average Criteria Maximum Concentration (CMC):</u>	
		<u>CMC = 287.8(Hardness)^{0.205797}(Sulfate)^{-0.07452}</u>	
		<u>4-day average Criteria Continuous Concentration (CCC):</u>	
		<u>CCC = 177.87(Hardness)^{0.205797}(Sulfate)^{-0.07452}</u>	
		<u>Hardness (in mg/L as CaCO₃) and sulfate (in mg/L) values shall be based on receiving water natural quality.</u>	
		* * * * *	

TABLE 3 (continued)

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Dissolved Oxygen		The following specific dissolved oxygen criteria recognize the natural process of stratification in lakes, ponds and impoundments. These criteria apply to flowing fresh waters and to the epilimnion of a naturally stratified lake, pond or impoundment. The hypolimnion in a naturally stratified lake, pond or impoundment is protected by the narrative water quality criteria in § 93.6 (relating to general water quality criteria). For nonstratified lakes, ponds or impoundments, the dissolved oxygen criteria apply throughout the lake, pond or impoundment to protect the critical uses.	
	DO ₁	For flowing waters, [minimum daily] 7-day average 6.0 mg/l; minimum 5.0 mg/l. <u>For naturally reproducing Salmonid early life stages, 7-day average 9.0 mg/l; minimum 8.0 mg/l, in accordance with (e).</u> For lakes, ponds and impoundments, minimum 5.0 mg/l.	CWF [HQ-WWF] [HQ-TSF]
	DO ₂	<u>[Minimum daily average 5.0 mg/l; minimum 4.0 mg/l.] 7-day average 5.5 mg/l; minimum 5.0 mg/l.</u>	WWF
	DO ₃	For the period February 15 to July 31 of any year, [minimum daily] 7-day average 6.0 mg/l; minimum 5.0 mg/l. For the remainder of the year, [minimum daily] 7-day average [5.0] 5.5 mg/l; minimum [4.0] 5.0 mg/l.	TSF
	[DO₄	Minimum 7.0 mg/l.	HQ-CWF]
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New wild trout / D.O. provision §93.7(e)

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(e) For naturally reproducing Salmonids, protected early life stages include: all embryonic and larval stages and all juvenile forms to 30 days after hatching. The DO₁ standard for naturally reproducing Salmonid early life stages shall apply during October 1 through May 31.

The DO₁ standard for naturally reproducing Salmonid early life stages applies unless it can be demonstrated to the Department's satisfaction, that the following conditions are documented: 1) the absence of young of the year Salmonids measuring less than 150 mm in the surface water; and 2) the absence of multiple age classes of Salmonids in the surface water. These conditions shall only apply to Salmonids resulting from natural reproduction occurring in the surface waters. Additional biological information may be considered by the Department which evaluates the presence or absence of early life stages.

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TABLE 3 (continued)

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Dissolved Oxygen	(Resuming with Table 3)	The following specific dissolved oxygen criteria recognize the natural process of stratification in lakes, ponds and impoundments. These criteria apply to flowing <u>fresh</u> waters and to the epilimnion of a naturally stratified lake, pond or impoundment. The hypolimnion in a naturally stratified lake, pond or impoundment is protected by the narrative water quality criteria in § 93.6 (relating to general water quality criteria). For nonstratified lakes, ponds or impoundments, the dissolved oxygen criteria apply throughout the lake, pond or impoundment to protect the critical uses.	
	DO ₁	For flowing waters, [minimum daily] 7-day average 6.0 mg/l; minimum 5.0 mg/l. <u>For naturally reproducing Salmonid early life stages, 7-day average 9.0 mg/l; minimum 8.0 mg/l, in accordance with (e).</u> For lakes, ponds and impoundments, minimum 5.0 mg/l.	CWF [HQ-WWF] [HQ-TSF]
	DO ₂	<u>[Minimum daily average 5.0 mg/l; minimum 4.0 mg/l.] 7-day average 5.5 mg/l; minimum 5.0 mg/l.</u>	WWF
	DO ₃	For the period February 15 to July 31 of any year, [minimum daily] 7-day average 6.0 mg/l; minimum 5.0 mg/l. For the remainder of the year, [minimum daily] 7-day average [5.0] 5.5 mg/l; minimum [4.0] 5.0 mg/l.	TSF
	[DO₄	Minimum 7.0 mg/l.	HQ-CWF]
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TABLE 3 (continued)

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Sulfate	Sul ₁	Maximum 250 mg/L	PWS
	Sul ₂	<p><u>Shall not exceed the lesser of either 2,000 mg/L, or the result of the appropriate hardness and chloride based conditional numeric limits (in mg/L sulfate) as described below. Hardness (in mg/L as CaCO₃) and chloride (in mg/L) values used in the determination of the sulfate water quality standard shall be based on receiving water natural quality.</u></p> <p><u>A.) 500 mg/L, if the hardness concentration is less than 100 mg/L, or chloride concentration is less than 5 mg/L.</u></p> <p><u>B.) The result of the following equations (in mg/L sulfate) when the hardness value is greater than or equal to 100 mg/L, but less than or equal to 500 mg/L:</u></p> <p style="padding-left: 40px;"><u>1.) if the chloride value is greater than or equal to 5 mg/L, but less than 25 mg/L:</u></p> <p style="padding-left: 80px;"><u>$S = [-57.478 + 5.79 (\text{hardness}) + 54.163 (\text{chloride})] * 0.65$</u> <u>where, S = sulfate concentration; or</u></p> <p style="padding-left: 40px;"><u>2.) if the chloride value is greater than or equal to 25 mg/L:</u></p> <p style="padding-left: 80px;"><u>$S = [1276.7 + 5.508 (\text{hardness}) - 1.457 (\text{chloride})] * 0.65$</u> <u>where, S = sulfate concentration</u></p> <p><u>C.) 2,000 mg/L, if the hardness concentration is greater than 500 mg/L and the chloride concentration is 5 mg/L or greater.</u></p>	LWS, AWS, CWF, WWF, TSF, MF
* * * * *			

TABLE 3 (continued)

		* * * * *	
Temperature		Maximum temperatures in the receiving water body resulting from heated waste sources regulated under Chapters [92] 92a , 96 and other sources where temperature limits are necessary to protect designated and existing uses. Additionally, these wastes may not result in a change by more than 2°F during a 1-hour period.	See the following table.
		* * * * *	

Special Question to be asked in Preamble about Temperature

During this triennial, the Department will be seeking technical and scientific information about temperature studies and available data related to the rate of temperature change and its effect on aquatic organisms.

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93.7(b) [Table 4 contains specific water quality criteria that apply to the water uses to be protected. When the symbols listed in Table 4 appear in the Water Uses Protected column in § 93.9a—93.9z, they have the meaning listed in the second column of Table 4. Exceptions to these standardized groupings will be indicated on a stream-by-stream or segment-by-segment basis by the words “Add” or “Delete” followed by the appropriate symbols described elsewhere in this chapter.

TABLE 4

Symbol	Water Uses Protected	Specific Criteria
WWF	Statewide list	DO ₂ and Temp ₂
CWF	Statewide list plus Cold Water Fish	DO ₁ and Temp ₁
TSF	Statewide list plus Trout Stocking	DO ₃ and Temp ₃
HQ-WWF	Statewide list plus High Quality Waters	DO ₁ and Temp ₂
HQ-CWF	Statewide list plus High Quality Waters and Cold Water Fish	DO ₄ and Temp ₁
HQ-TSF	Statewide list plus High Quality Waters and Trout Stocking	DO ₁ and Temp ₃
EV	Statewide list plus Exceptional Value Waters	Existing quality]

[Reserved]

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§ 93.8b. Metals criteria.

Dissolved criteria are footnoted in Table 5, and have been developed by applying the most current EPA conversion factors to the total recoverable criteria. The EPA factors are listed in the following Conversion Factors Table.

Conversion Factors Table

	Chronic	Acute	Source
Arsenic	1.000 (As3+)	1.000 (As3+)	1,2
Cadmium	1.101672- (ln[H] x 0.041838)	1.136672- (ln[H] x 0.041838)	2
<u>Chromium III</u>	<u>.860</u>	<u>.316</u>	<u>1,2</u>
Chromium VI	0.962	0.960	1, 2

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TABLE 5
WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES

Basis for Criteria Development

- **The following criteria were developed by the Department using the most recent toxicity data currently available. The Department has also verified that all criteria to be proposed have analytical methods available for quantification:**
- **Human health criteria** were developed using:
 - EPA, “Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health, 2000”.
 - The Department uses the EPA Integrated Risk Information System (IRIS) database as its primary source of toxicity information.
 - EPA uses an ongoing screen review of scientific literature for chemicals in IRIS.
 - All toxicity data in IRIS have been through extensive internal and external peer reviews.
- **Aquatic Life criteria** were derived using:
 - “Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses” (Stephen et al. 1985).
 - All acute and chronic aquatic life toxicity data used in the criteria development included organism’s specific to PA waters.

93.8c. Human health and aquatic life criteria for toxic substances.

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TABLE 5

WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES

PP NO	Chemical Name	CAS Number	Fish and Aquatic Life Criteria		Human	
			Criteria Continuous Concentrations (ug/L)	Criteria Maximum Concentration (ug/L)	Health Criteria (ug/L)	
			* * * * *			
9A	PENTACHLORO-PHENOL	00087865	Exp(1.005x[pH]-5.134) @pH= 6.5 7.8 9.0 Crit= 4.1 15 50	Exp(1.005x[pH]-4.869) @pH= 6.5 7.8 9.0 Crit= 5.3 19 65	0.27	CRL
10A	PHENOL	00108952	N/A	N/A	[21000] 10400	H
11A	2,4,6-TRICHLOROPHENOL	00088062	91	460	1.4	CRL
1V	ACROLEIN	00107028	[1] 3.0	[5] 3.0	[190] 6.0	H

TABLE 5 (continued)

PP NO	Chemical Name	CAS Number	Fish and Aquatic Life Criteria		Human	
			Criteria Continuous Concentrations (ug/L)	Criteria Maximum Concentration (ug/L)	Health Criteria (ug/L)	
2V	ACRYLONITRILE	00107131	130 * * * * *	650	0.051	CRL
26V	1,2-trans-DICHLORO-ETHYLENE	00156605	1400	6800	140	H
-	<u>1,2-cis-DICHLORO-ETHYLENE</u>	<u>00156592</u>	<u>N/A</u>	<u>N/A</u>	<u>12</u>	<u>H</u>
27V	1,1,1-TRICHLORO-ETHANE	00071556	610 * * * * *	3000	N/A	-
-	ACETONE	00067641	86000	450000	3500	H
-	<u>ACRYLAMIDE</u>	<u>00079061</u>	<u>N/A</u>	<u>N/A</u>	<u>0.07</u>	<u>CRL</u>
-	ALUMINUM	07429905	N/A	750	N/A	-
-	BARIUM	07440393	4100	21000	2400	H
-	<u>BENZENE METADISULFONIC ACID</u>	<u>00098486</u>	<u>1600000</u>	<u>2600000</u>	<u>N/A</u>	<u>-</u>
-	<u>BENZENE MONOSULFONIC ACID</u>	<u>00098113</u>	<u>1200000</u>	<u>2000000</u>	<u>N/A</u>	<u>-</u>
-	<u>BENZYL CHLORIDE</u>	<u>00100447</u>	<u>N/A</u>	<u>N/A</u>	<u>0.2</u>	<u>CRL</u>
-	BORON	07440428	1600	8100	3100	H
-	<u>2-BUTOXY ETHANOL</u>	<u>00111762</u>	<u>N/A</u>	<u>N/A</u>	<u>700</u>	<u>H</u>

TABLE 5 (continued)

PP NO	Chemical Name	CAS Number	Fish and Aquatic Life Criteria		Human	
			Criteria Continuous Concentrations (ug/L)	Criteria Maximum Concentration (ug/L)	Health Criteria (ug/L)	
—	COBALT	07440484	19	95	N/A	-
—	p-CRESOL	00106445	160	800	N/A	-
<u>—</u>	<u>CYCLOHEXYLAMINE</u>	<u>00108918</u>	<u>N/A</u>	<u>N/A</u>	<u>1000</u>	<u>H</u>
<u>—</u>	<u>1,4-DIOXANE</u>	<u>00123911</u>	<u>N/A</u>	<u>N/A</u>	<u>0.35</u>	<u>CRL</u>
—	DIAZINON	<u>00</u> 333415	0.17	0.17	N/A	-
—	FORMALDEHYDE	00050000	440	2200	700	H
—	2-HEXANONE	00591786	4300	21000	N/A	-
—	LITHIUM	07439932	N/A	N/A	N/A	-
—	METHYLETHYL KETONE	00078933	32000	230000	21000	H
—	METHYLISO-BUTYL KETONE	00108101	5000	26000	N/A	-
—	METOLACHLOR	51218452	NA	NA	69	H

TABLE 5 (continued)

PP NO	Chemical Name	CAS Number	Fish and Aquatic Life Criteria		Human	
			Criteria Continuous Concentrations (ug/L)	Criteria Maximum Concentration (ug/L)	Health Criteria (ug/L)	
—	MOLYBDENUM	07439987	1900	6000	210	H
—	NONYLPHENOL	00104405	6.6	28	N/A	-
—	P-PHENOL SULFONIC ACID	00098679	1400000	3500000	N/A	-
—	I-PROPANOL	00071238	46000	230000	N/A	-
—	2-PROPANOL	00067630	89000	440000	N/A	-
—	RESORCINOL	01084603	7200	28000	2700	H
—	STRONTIUM	07440246	N/A	N/A	4000	H
—	1,2,3-TRICHLORO-PROPANE	00096184	N/A	N/A	210	H
—	1,2,4-TRIMETHYLBENZENE	00095636	N/A	N/A	72	H
—	1,3,5-TRIMETHYLBENZENE	00108678	N/A	N/A	72	H
—	XYLENE	01330207	210	1100	70000	H
			* * * * *			

§ 93.8d. Development of site-specific water quality criteria.

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f) If the Department determines that site-specific criteria are appropriate in accordance with subsection (a), the Department will do the following:

(1) Publish the site-specific criterion in the *Pennsylvania Bulletin*, along with other special conditions under [[§ 92.61\(a\)\(5\)](#)] [§§ 92a.82 and 92a.83](#) (relating to public notice of permit application; and public hearing) and provide for public participation and public hearing in accordance with § [\[92.61 and §§ 92.63 and 92.65\]](#) [92a.81, 92a.82, 92a.83 and 92a.85](#) (relating to public access to information; and notice to other government agencies).

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DESIGNATED WATER USES AND WATER QUALITY CRITERIA

Drainage Lists at Sections 93.9a - 93.9z

The Department also routinely reviews and will make updates, revisions, and corrections to the water quality standards chapters for typographical and translation errors, insert missing or misplaced entries, and correct references associated with prior rulemaking and/or publication activities.

This includes corrections to use designations and stream entries found in Drainage Lists at Sections 93.9a-93.9z, which are not being addressed by separate stream redesignation rulemakings.

These corrections generally do not change the original regulatory intent of the code, but provide clarification or correct specific errors, as needed.

Next Steps / Actions

- WRAC recommendation on Forwarding TR13 Proposed Rulemaking to EQB – Jan. 11, 2012 WRAC meeting
- Projected EQB meeting – March 20, 2012
- Publish Notice of Proposed Rulemaking in PA Bulletin
 - Opens 45-day public comment period
 - Hold Public hearings/meetings as warranted

- Return to WRAC with Draft responses to public comments, and recommendations on Final Rulemaking – Summer/Fall 2012
- Present Final Rulemaking to EQB – Winter 2012/13
- Publish Final Rulemaking in Pa Bulletin – April 2013
- Submit Final Triennial to U.S. EPA Region 3
by May 15, 2013 !

Questions?