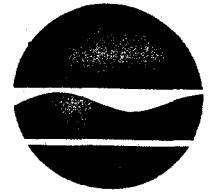


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New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010



Michael D. Zagata
Commissioner

JUN 20 1995

Mr. Douglas Tomchuk
U.S. Environmental Protection
Agency - Region II
290 Broadway
New York, NY 10007-1866

Dear Mr. Tomchuk:

RE: Hudson River Reassessment RI/FS
Site No.: 5-46-031

This letter is supplying information from the State of New York regarding Applicable or Relevant and Appropriate Requirements (ARARs) and other guidance values to be considered (TBCs) for the Hudson River Reassessment RI/FS Project being conducted by United States Environmental Protection Agency (USEPA).

Enclosed are tables which identify the ARARs and TBCs which are appropriate for the Hudson River Reassessment RI/FS at this point in the project.

Table 1 contains a listing of Chemical Specific ARARs and provides concentration values for a variety of environmental media for the site. Table 2 contains a listing of Location Specific ARARs.

Table 3 contains a listing of additional or alternate information regarding cleanup criteria and goals.

Table 4 is a general index or list of New York State ARARs. This information has been previously transmitted to the USEPA as the basic overall list of ARARs for the State of New York. Consistent with program policy this list is subject to future revision, in particular, the addition of other ARARs.

Attachment "A" contains proposed guidance values for PCBs in a variety of environmental media. These proposed guidance values are being developed and are subject to future revision. In general, they are based on long-term acceptable exposure levels to human or animal populations based on health risk assessments.

Attachment "B" contains a summary of Part 5 of the State Sanitary Code, which limits organic chemical contaminants in public drinking water supplies. The effective date of the MCLs in this code revision is January 6, 1993.

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Attachment "C" contains a brief summary of the methodology which was used by the Department in formulating sediment criteria for PCBs.

Attachment "D" contains a New York State Human Health Fact Sheet of the ambient water quality value for PCBs based on human consumption of fish and shellfish.

Attachment "E" contains a listing of Additional Guidance which should be viewed as TBCs for the project.

It is our understanding, based on the "Interim Guidance on Compliance with Applicable and Appropriate Requirements (ARARs)", that the appropriate cleanup levels for surface or groundwater, that can be used for drinking water, are the Maximum Contaminant Levels (MCLs) or Maximum Contaminant Level Goals (MCLGs). This guideline also indicates that the more stringent of the ARARs (whether State or Federal) will in general take precedence. ARARs generally fall within one or more of the following three categories: chemical, location, and action specific. It should also be noted that it is the intent of the Department to implement ARARs and other site cleanup criteria as consistently and uniformly as possible, throughout the State.

As of this date, the enclosed ARARs are required for this site based on the chemical and location being studied by USEPA. If additional contaminants are identified, new ARARs and TBCs must be considered. We propose to update and identify additional ARARs during the development of remedial alternatives in the Feasibility Study or if other changes in the project warrant us to do so. Please have your staff and consultants contact us during the feasibility study preparation to identify and discuss additional action specific ARARs.

As we have stated before, NYCRR Part 373 is an applicable requirement for the management of residuals which are a hazardous waste. In New York State, wastes containing greater than 50 parts per million PCBs are managed as hazardous wastes. NYCRR Part 360 is an applicable requirement for the management of residuals which may be managed as an industrial or solid waste. The expressed preference in SARA for permanent long-term solutions which reduce or eliminate toxicity and mobility to the maximum extent feasible is fully endorsed by the Department.

We appreciate this opportunity to work with USEPA on the Hudson River PCB contaminated sediments. Should you have any questions or require any additional information, please contact this office at (518) 457-5637.

Sincerely,



William T. Ports, P.E.
Project Manager
Division of Hazardous Waste Remediation

Enclosures
cc:w/o enc.

R. Montione D. Sommer J. Davis

Table 1
Hudson River PCB Reassessment RI/FS
New York State Chemical Specific Applicable
or Relevant and Appropriate Requirements

Media	PCB Value	Units	Basis
Surface Water	0.01	ug/l	(1)
Surface Water	0.001	ug/l	(2)
Ground Water	0.1	ug/l	(3)
SPDES Discharge	ND		(4)
Drinking Water	1.0	ug/l	(5)

1. Protection of human health, 6 NYCRR Parts 701 and 702.
2. Protection of aquatic life, 6 NYCRR Parts 701 and 702.
3. Protection of human health, 6 NYCRR Part 702.
4. 6 NYCRR Parts 750 through 757.
5. Current New York State Department of Health (NYSDOH) interim guideline value in accordance with Part 5 of the State Sanitary Code. See Attachment "B" enclosed.

Table 2
Hudson River PCB Reassessment RI/FS
New York State Location Specific Applicable or
Relevant and Appropriate Requirements

Location	Requirement	Basis
Floodplain	Construction requirements for a Hazardous Waste Facility in a 100 year Floodplain.	6 NYCRR 372-2
Wetlands	Requirements to be followed for activities in wetlands and in areas adjacent to wetlands.	6 NYCRR 664
Canals	The State Constitution requires the maintenance of canals and promulgated Laws require a specified depth that must be maintained.	New York State Constitution Article XV, Section 1-4
Siting Board Part 361	Hazardous Waste Management Facilities must obtain a Certificate from the Hazardous Waste Facilities Siting Board before siting new facilities.	6 NYCRR 361
Use and Protection of Waters		6 NYCRR Part 608
Endangered & Threatened Species of F&W	Restricts activities in areas inhabited by endangered species	6 NYCRR Part 182

Table 3

Hudson River Reassessment RI/FS

MEDIA SPECIFIC

ENVIRONMENTAL QUALITY GUIDELINES

PARAMETER	MEDIA	LIMITING VALUE	UNITS	BASIS
PCB	Ambient Water	0.0000006	ug/l	(1)
PCB	Sediment	10.0	ug/kg	(2)
PCB	Soil (Surface)	1.0	mg/kg	(3)
PCB	Soil (Subsurface)	10.0	mg/kg	(3)
PCB	Fish	0.11	mg/kg	(4)
PCB	Air	0.01	ug/m3	(5)
PCB	Air	0.00045	ug/m3	(5)

NOTES:

1. "Quality Criteria for Water - 1993." Based on level which may result in an incremental increase of cancer risk over the lifetime which is estimated at 1.0×10^{-6} . The ambient water concentration of PCBs should ideally be zero, based on the nonthreshold assumption for this chemical. However, a level of zero may not be attainable at the present time.
2. Based on current USEPA and NYSDEC/DFW guideline values and methods for deriving sediment criteria ARARs for nonpolar organics. See Attachment "C" enclosed. This number is based on a fraction of organic carbon in the sediment equal to 1 percent (1% Foc) which is a proportion of 0.01. This guideline is dependent upon the organic content equal to 1 %. If the organic content was 3 % then the guideline value would be 42 ug/kg.
3. This current NYSDEC guidance value was proposed as a cleanup for surface soils subject to potential surface water erosion (or other potential forms of movement or transport).
4. From "Great Lakes Water Quality Agreement of 1978" between the United States of America and Canada signed at Ottawa, November 22, 1978; International Joint Commission between Canada and the United States of America concerning the Great Lakes St. Lawrence River Drainage Basin.
5. Draft New York State Air Guide-1, Guidelines for the Control of Toxic Ambient Air Contaminants; Division of Air Resources 1991.

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- Division of Solid Waste
 - *6 NYCRR Part 360 - Solid Waste Management Facilities (effective October 9, 1993)
- Division of Hazardous Substances Regulation
 - *6 NYCRR Part 370 - Hazardous Waste Management System: General (revised January 14, 1995)
 - Part 371 - Identification and Listing of Hazardous Wastes (revised January 14, 1995)
 - Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (revised January 14, 1995)
 - 6 NYCRR Subpart 373-1 - Hazardous Waste Treatment, Storage and Disposal Facility Permitting Requirements (revised January 14, 1995)
 - 373-2 - Final Status Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities (revised January 14, 1995)
 - 373-3 - Interim Status Standards for Owners and Operators of Hazardous Waste Facilities (revised January 14, 1995)
 - 373-4 - Facility Standards for the Collection of Household Hazardous Waste and Hazardous Waste from Conditionally Exempt Small Quantity Generators (January 14, 1995)
 - 6 NYCRR Subpart 374-1 - Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities (revised January 14, 1995)
 - 6 NYCRR Subpart 374-2 - Standards for the Management of Used Oil (January 14, 1995)
 - 6 NYCRR Part 376 - Land Disposal Restrictions (January 14, 1995)
 - **Technical and Administrative Guidance Memorandum (TAGM) 3028 - "Contained-In" Criteria for Environmental Media (November 1992)
- Division of Hazardous Waste Remediation
 - 6 NYCRR Part 375 - Inactive Hazardous Waste Disposal Site Remedial Program (May 1992)

**revised

** newly added

- Technical and Administrative Guidance Memorandum (TAGM)
 - HWR-92-4046 Determination of Soil Cleanup Objectives and Cleanup Levels. (November 1992)
 - HWR-92-4030 Selection of Remedial Actions at Inactive Hazardous Waste Sites. (May 1990)
- ** HWR-94-4027 Assistance for Contaminated Private and Public Water Supplies (April 1994)
- ** HWR-89-4031 Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites (October 1989)
- ** HWR-92-4042 Interim Remedial Measures (June 1992)
- ** HWR-92-4048 Interim Remedial Measures - Procedures (December 1992)

**revised ** newly added

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- 6 NYCRR Part 702.15(a),(b),(c),(d) and (e) Empowers DEC to Apply and Enforce Guidance where there is no Promulgated Standard
- Technical and Operations Guidance Series (TOGS)
 - ** November 1991 - Analytical Services Protocols (ASP)
 - 1.1.1; October 1993 - Ambient Water Quality Standards and Guidance Values
 - ** 1.1.2; August 1994 - Groundwater Effluent Limitations
 - 1.2.1; April 1990 - Industrial SPDES Permit Drafting Strategy for Surface Waters
 - 1.3.1; May 1990 - Waste Assimilative Capacity Analysis and Allocation for Setting Water Quality Based Effluent Limits
 - 1.3.1 C; August 1991 - Development of Water Quality Based Effluent Limits for Metals Amendment
 - 1.3.2; May 1990 - Toxicity Testing in the SPDES Permit Program
 - 1.3.4; April 1, 1987 - BPJ Methodologies
 - 1.3.4.a; November 3, 1988 - BPJ Methodologies/Amendments
 - 1.3.7; July 1990 - Analytical Detectability and Quantitation Guidelines for Selected Environmental Parameters
 - ** 1.3.8; October 1994 - New Discharges to Publicly Owned Treatment Works
 - 2.1.2; July 1990 - Underground Injection/Recirculation (UIR) at Groundwater Remediation Sites
 - 2.1.3; October 1990 - Primary and Principal Aquifer Determinations

• **Division of Air**

- 6 NYCRR Part 200 (200.6) - General Provisions (Revised January 29, 1993)
- 6 NYCRR Part 201 - Permits and Certificates (Revised March 31, 1993)
- 6 NYCRR Part 211 (211.1) - General Prohibitions
- 6 NYCRR Part 212 - General Process Emission Courses
- **6 NYCRR Part 227 - Stationary Combustion Installations
- **6 NYCRR Part 231 - New Source Review in Nonattainment Areas and Ozone Transport Regions
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- NYSDOH PWS 68 - Blending Policy for Use of Sources of Drinking Water
- NYSDOH PWS 69 - Organic Chemical Action Steps for Drinking Water
- NYSDOH PWS 152 - Procedure for Handling Community Water System Emergencies
- NYSDOH PWS 159 - Responding to Organic Chemical Concerns at Public Water Systems
- NYSDOH PWS 160 - Public Notification of Organic Chemical Incidents Regarding Public Water Supplies
- The 10 ppt criterion for 2,3,7,8 - TCDD in fish flesh
- The Binghamton State Office Building cleanup criteria for PCDDs, PCDFS and PCBs
- Part 5 of the State Sanitary Code, Drinking Water Supplies (effective March 11, 1992)
- Part 170 of title 10 of the NYCRR, Water Supply Sources
- Appendix 5-A of Part 5 of the State Sanitary code (Recommended Standards for Water Works)
- Appendix 5-B of Part 5 of the State Sanitary Code (Rural Water Supply)
- NYSDOH Interim Report on Point-of-Use Activated Carbon Treatment
- Part 16 draft limits on the disposal of radioactive materials into sewer systems
- Criteria for the development of health advisories for sport fish consumption
- Tolerance levels for EDB in food

* revised

** newly added

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- 663 - Freshwater Wetlands Permit Requirements
- 664 - Freshwater Wetlands Maps and Classifications
- 665 - Local Government Implementation of the Freshwater Wetlands Act and Statewide Minimum Land - Use Regulations for Freshwater Wetlands
- **666 - Administration and Management of the Wild, Scenic and Recreational Rivers System in New York State Excepting the Adirondack Park
- 6 NYCRR Part 182 - Endangered and Threatened Species of Fish and Wildlife
- ECL Article 24 and Article 71, Title 23 - Freshwater Wetlands Act

** Technical Guidance for Screening Contaminated Sediments. (July 1994, same document as dated November 1993)

** Fish & Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA). (October 1994)

** Freshwater Wetlands Regulations, Guidelines on Compensatory Mitigation. (October 1993)

** Niagara River Biota Contamination Project: Fish Flesh Criteria for Piscivorous Wildlife. (July 1987)

- Division of Regulatory Affairs

- 6 NYCRR Part 361 - Siting of Industrial Hazardous Waste Facilities
- 6 NYCRR Part 364 - Waste Transporter Permits (revised January 12, 1990)
- Article 27, Title II of the ECL - Industrial Siting Hazardous Waste Facilities
- 6 NYCRR Part 621 - Uniform Procedures
- 6 NYCRR Part 624 - Permit Hearing Procedures

- Division of Marine Resource, Bureau of Marine Habitat Protection

- Chapter 10 of 6 NYCRR Part 661 Tidal Wetlands - Land Use Regulations

- Division of Mineral Resources

- Article 23, Title 27 - NYS Mined Land Reclamation Law
- ** - Article 23, and Article 71, Title 13-oil, Gas and Solution Mining Law

* revised

** newly added

- 6 NYCRR Part 420 - General
- 421 - Permits
- 422 - Mined Land - Use Plan
- 423 - Reclamation Bond
- 424 - Enforcement
- 425 - Civil Penalties
- ** 550 - Promulgations and Enforcement of Rules and Regs.
- ** 551 - Reports and Financial Security
- ** 552 - Permits to Drill, Deepen, Plug Back or Convert Wells
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- ** 557 - Secondary Recovery and Pressure Maintenance
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- ** 559 - "Bass Island" Regulations

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- 12 NYCRR 50 - Lasers
- 12 NYCRR 38 - Ionizing Radiation Protection

NEW YORK STATE DEPARTMENT OF AGRICULTURE AND MARKETS

- 1 NYCRR Part 371 - Notice of Intent

COASTAL MANAGEMENT

- Part 600 - Department of State, Waterfront Revitalization and Coastal Resources Act
- State Coastal Policies
- State Consistency Process
- Federal Consistency Process
- NYS Coastal Policies
- NYS Coastal Management Program
- Federal Register, June 25, 1979 - Part V - Department of Commerce - Federal Consistency Regulation

**FEDERAL REQUIREMENTS

US ENVIRONMENTAL PROTECTION AGENCY

- Hydrologic Evaluation of Landfill Performance (HELP) Model.
- Hydrologic Simulation of Solid Waste Disposal Sites.
- Solidification/Stabilization and its Application to Waste Materials; June 1993.

* revised

** newly added

- 16 USC 661 - Fish and Wildlife Coordination Act
- Integrated Risk Information System (IRIS)
- Risk Assessment Guidance for Superfund - Volume 1 - Human Health Evaluation Manual; December 1989
- 40 CFR Part 60 Subpart WWW: Standards of Performance for Municipal Solid Waste Landfills; December 1994
- 40 CFR Part 280; Guidelines for Specifications of disposal Sites for Dredged or Fill Material

US ARMY CORPS OF ENGINEERS

- Executive Order 11990 - Protection of Wetlands; May 1977
- 33 USC 466 Section 404 - Clean Water Act
- 33 CFR Parts 320-330; Regulatory Programs of the Corps of Engineers

OSHA/PESH

- 29 CFR Part 1910.120; Hazardous Waste Operations and Emergency Response

US

- 16 USC 470 - National Historic Preservation Act

Attachment C

Hudson River Reassessment RI/FS

Sediment Criteria

Water quality standards or guidance values can be used to derive sediment criteria ARARs for non-polar organics with the following formula:

$$\text{Sediment Criterion, ug/Kg} = \text{AWQS/GV, ug/l} \times \text{Kow, l/kg} \times \frac{1 \text{ Kg}}{1,000 \text{gOC}}$$

Where: AWQS/GV is the ambient water quality standard or guidance value for a substance,

Kow is the octanol water partition coefficient for that substance, and

1 Kg/ 1,000 gOC is a unit conversion factor.

Sediments with contaminants in excess of the criterion would be predicted to contain interstitial water in excess of the AWQS/GV. The PCB AWQS is designed to protect wildlife which consume other biota. Therefore, exceedance of the sediment criterion would be predicted to cause accumulation of PCB in surface water biota to levels that would be harmful to wildlife consumers of the biota.

The ARAR for contaminants in soil should be wildlife risk based to ensure no toxicity to wildlife from exposure to contaminated soil. The risk assessment being conducted should quantify the risk to wildlife from contaminants at the site from all expected routes of exposure; i.e. inhalation, dermal, soil ingestion, plant uptake and ingestion, and food chain magnification. The acceptable daily intake (ADI), for terrestrial wildlife is 0.02 mg/kg/day of PCB (Newell et. al. 1987).

Carbon Normalized Sediment Criterion for PCB is:

$$\begin{aligned} &= 0.001 \text{ ug/l} \times 10^{6.14} \times 1 \text{ Kg/1,000 gOC} \\ &= 1.4 \text{ ug/gOC} \end{aligned}$$

For example, to obtain a site specific criterion for a sediment with 3% total OC multiply the normalized criterion by the fraction of organic carbon:

$$\text{Site-Specific criterion} = 1.4 \text{ ug/gOC} \times 30 \text{ gOC/Kg} = 42 \text{ ug/Kg}$$

D

Fact Sheet Date: DRAFT

**NEW YORK STATE
- HUMAN HEALTH FACT SHEET -**

**Ambient Water Quality Value
Based on Human Consumption of Fish**

SUBSTANCE: Polychlorinated biphenyls **CAS REGISTRY NUMBER:** 1336-36-3

AMBIENT WATER QUALITY VALUE: 1×10^{-6} ug/L

BASIS: Bioaccumulation

INTRODUCTION

This value applies to the water column and is designed to protect humans from the effects of waterborne contaminants that may bioaccumulate in fish; it is referred to as a Health (Fish Consumption) or H(FC) value. The H(FC) value is based on three components, the toxicity of the substance to humans, the extent to which it bioaccumulates in fish, and the rate of fish consumption.

SUMMARY OF INFORMATION

A. Toxicity

The toxicity of polychlorinated biphenyls (PCBs) relevant to human health is described in a separate fact sheet (NYS, 1997). That fact sheet, which supports an ambient water quality value for protection of sources of potable water, derives a human dose of 2.5×10^{-3} ug PCBs/kg · day based on a slope of $0.4 \text{ [mg/(kg · day)]}^{-1}$. However, as described in U.S. EPA's (1996) reassessment of PCB carcinogenicity, a higher slope of $2 \text{ [mg/(kg · day)]}^{-1}$ is recommended for exposure through the food chain, which tends to concentrate the persistent, highly chlorinated PCB congeners. Thus, the latter slope is used as the basis for the toxicity component of this H(FC) value.

B. Bioaccumulation

A measurement of bioaccumulation is necessary to derive a value to protect human consumers of fish. Bioaccumulation is the process by which a substance becomes concentrated in an organism through the organism's exposure to the contaminant in food and water. Bioaccumulation is represented numerically by a bioaccumulation factor, or BAF, which is the ratio of the concentration of a substance in the organism to that in the water column.

The term bioconcentration also describes the concentration of a substance in an organism relative to the concentration in the water column. A bioconcentration factor (BCF), however, is measured with exposure to the contaminant by water only. A BCF may be equal to the BAF for many substances, but can substantially underestimate it for others.

U.S. EPA (1995a) has promulgated, as final Federal regulations, procedures for deriving bioaccumulation factors. U.S. EPA (1995b) presented BAFs for PCBs; these were subsequently revised (U.S. EPA, 1997).

A key aspect of U.S. EPA's procedure is that bioaccumulation is believed to be related to the concentration of freely dissolved substance. Hydrophobic organic substances are considered to exist in water in three phases: freely dissolved, sorbed to dissolved organic matter and sorbed to suspended solids (U.S. EPA, 1995b). Because BAF determinations are often based on measurements of total or dissolved substance, a measured BAF must be adjusted based on the estimated fraction of freely dissolved material (f_{fd}). In addition, because measured BAFs are determined based on the percent lipid in the species studied, they are adjusted, or normalized, to 100% lipid to allow comparison of BAFs derived from species with different tissue lipid fractions. A BAF adjusted for both fraction freely dissolved and normalized to 100% lipid is referred to as a "baseline BAF."

Although bioaccumulation is related to the freely dissolved substance, water quality criteria are based on total substance. A baseline BAF, therefore, is readjusted to a final BAF by the expected fraction freely dissolved and fish lipid content for the waters for which criteria are established. The relationship of field-measured or final BAF to the baseline BAF is shown in equation 1:

$$(Eq. 1) \quad \text{Baseline BAF} = \left[\frac{\text{Field or Final BAF}}{f_{fd}} \right] \left[\frac{1}{f_l} \right]$$

where f_l = fraction of tissue that is lipid and f_{fd} = fraction of substance that is freely dissolved.

Derivation of Baseline BAFs

U.S. EPA (1997) derived revised baseline BAFs for PCBs; these are shown below in Table 1.

Table 1	
Baseline BAFs for PCBs (U.S. EPA, 1997)	
Trophic Level	Baseline BAF (L/kg)
3	26,550,000
4	52,720,000

These values have been reviewed and are believed appropriate for both the Great Lakes and the rest of the State.

DERIVATION OF WATER QUALITY VALUE

As required by 6 NYCRR 702.8(a) the water quality value must equal the acceptable daily intake from fish consumption divided by a bioaccumulation factor and by a fish consumption rate of 0.033 kg/day.

A. Acceptable Daily Intake From Fish Consumption

As required by 6 NYCRR 702.8(b), the most stringent acceptable daily intake from fish consumption is the human dose for oncogenic effects, as determined from 6 NYCRR 702.4. This value is calculated from the cancer slope factor of $2 \text{ [mg/(kg} \cdot \text{day)]}^{-1}$, above, for a one-in-one million risk level as follows:

$$\frac{1 \times 10^{-6} \times 10^3 \text{ ug/mg}}{2 \text{ [(mg/(kg} \cdot \text{day)]}^{-1}} = 5 \times 10^{-4} \text{ ug/(kg} \cdot \text{day)}$$

B. Final BAF

As described above, a baseline BAF is adjusted by the fish lipid fraction and the fraction freely dissolved to yield a final BAF for the substance. Equation 1 (above) is rearranged to solve for final BAF:

$$\text{Final BAF} = [(\text{baseline BAF})(f_l) + 1](f_d)$$

where values for f_1 and f_{10} are appropriate to criteria for New York State. Because, as described below, humans are exposed to fish from two trophic levels, this calculation is performed to generate final BAFs for trophic levels 3 and 4.

A fish lipid content of 3% had previously been used when calculating BAFs for deriving criteria for New York State. U.S. EPA (1995a) apportions daily fish consumption between fish of trophic levels 3 and 4. Specifically, 24% is assigned to trophic level 3 fish, with a standardized lipid fraction of 0.0182 (1.82%), and 76% to trophic level 4 fish, with a standardized lipid fraction of 0.0310 (3.1%). The weighted average lipid fraction of trophic level 3 and 4 fish is thus 0.028 (2.8%), which is very close to the value of 3% that had been used in New York State. U.S. EPA's apportionment approach is believed to be protective of human consumers of fish statewide, and will be used in the derivation of the water quality value in this fact sheet to achieve consistency with requirements for the Great Lakes Basin.

For deriving f_{10} values for the Great Lakes, U.S. EPA (1995a) procedures use DOC and POC values of 2 and 0.04 mg/L respectively. The POC level of 0.04 mg/L is on the low end for the Great Lakes but U.S. EPA selected it to ensure protection throughout the System.

Data on levels of DOC and POC were examined for fresh and marine waters in New York State. Levels of DOC vary somewhat through the State but are fairly close to 2 mg/L. The f_{10} is not very sensitive to changes in concentration of DOC. Levels of POC in New York State range from zero to several mg/L, but a sufficient number of near-zero values were found such that the level that EPA uses for the Great Lakes Basin seems appropriate for statewide standards and at the same time provides consistency with the Federal requirements for the Great Lakes System.

Using these values for DOC and POC, f_{10} is calculated using the equation:

$$f_{10} = \frac{1}{1 + (0.00000024 \text{ kg/L})(K_{ow})}$$

With a composite K_{ow} of 2,107,000 (U.S. EPA, 1997), the fraction freely dissolved is calculated to be 0.6642.

As described above, the baseline BAFs for PCBs for trophic levels 3 and 4 are 26,550,000 and 52,720,000 L/kg respectively.

The final BAF for trophic level 3 is calculated as:

$$\text{Final BAF}_{\text{TL3}} = [(\text{baseline BAF}_{\text{TL3}})(f_{\text{TL3}}) + 1](f_{\text{fd}}) =$$

$$\text{Final BAF}_{\text{TL3}} = [(26,550,000)(0.0182) + 1](0.6642) = 321,000 \text{ L/kg}$$

The final BAF for trophic level 4 is calculated as:

$$\text{Final BAF}_{\text{TL4}} = [(\text{baseline BAF}_{\text{TL4}})(f_{\text{TL4}}) + 1](f_{\text{fd}}) =$$

$$\text{Final BAF}_{\text{TL4}} = [(52,720,000)(0.0310) + 1](0.6642) = 1,090,000 \text{ L/kg}$$

C. Human Exposure (Fish Consumption)

6 NYCRR 702.8 requires that H(FC) values be based on a fish consumption rate of 0.033 kg/day.

D. Calculation of Water Quality Value

The water quality value (WQV) is derived using a human body weight of 70 kg and a daily fish consumption rate of 0.033 kg as shown below. The fish consumption is apportioned as 24% trophic level 3 and 76% trophic level 4.

$$\text{WQV} = \frac{\text{Acceptable Daily Intake from Fish Consumption} \times 70 \text{ kg}}{[(\text{BAF}_{\text{TL3}})(0.24) + (\text{BAF}_{\text{TL4}})(0.76)] \times 0.033 \text{ kg/day}}$$

$$\begin{aligned} \text{WQV} &= \frac{5 \times 10^{-4} \text{ ug PCBs}/(\text{kg} \cdot \text{day}) \times 70 \text{ kg}}{[(321,000 \text{ L/kg})(0.24) + (1,090,000 \text{ L/kg})(0.76)] \times 0.033 \text{ kg/day}} \\ &= 1.17 \times 10^{-6} \text{ ug/L, rounded to } 1 \times 10^{-6} \text{ ug/L} \end{aligned}$$

REFERENCES

6 NYCRR (New York State Codes, Rules and Regulations). Water Quality Regulations, Surface Water and Groundwater Classifications and Standards: Title 6 NYCRR, Chapter X, Parts 700-705. Albany, NY: Department of Environmental Conservation.

NYS (New York State). 1997. Human Health Fact Sheet. Ambient Water Quality Value for Protection of Sources of Potable Water. Polychlorinated biphenyls. Albany, NY: Department of Environmental Conservation.

U.S. EPA (Environmental Protection Agency). 1995a. Final Water Quality Guidance for the Great Lakes System. 60 Federal Register: 15366-15425. March 23, 1995.

U.S. EPA (Environmental Protection Agency). 1995b. Great Lakes Water Quality Initiative Technical Support Document for the Procedure to Determine Bioaccumulation Factors. Office of Water. EPA-820-B95-005.

U.S. EPA (Environmental Protection Agency). 1996. On line. Integrated Risk Information System. (IRIS). Polychlorinated biphenyls. Office of Research and Development, Environmental Criteria and Assessment Office.

U.S. EPA (Environmental Protection Agency). 1997. 62 Federal Register: 11724. March 12, 1997.

New York State Department of Environmental Conservation
Division of Water
SJS
March 17, 1997

Attachment E

Hudson River PCB Reassessment RI/FS

Additional Guidance

1. **Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA), October 1994, New York State Department of Environmental Conservation, Division of Fish and Wildlife**
2. **Technical Guidance for Screening Contaminated Sediments, July 1994, New York State Department of Environmental Conservation, Division of Fish and Wildlife and Division of Marine Resources**
3. **Niagara River Biota Contamination Project: Fish Flesh Criteria for Piscivorous Wildlife, July 1987, Technical Report 87-3, Division of Fish and Wildlife**
4. **Interim Guidance Freshwater Navigational Dredging, October 1994, Division of Water**
5. **"Contained-In" Criteria for Environmental Media, New York State Department of Environmental Conservation, Division of Hazardous Substances Regulation, Technical Administrative Guidance Memorandum 3028**