WEST VIRGINIA
SECRETARY OF STATE
JOE MANCHIN, III
ADMINISTRATIVE LAW DIVISION

Form #3

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OFFICE WEST VIRGINIA
SECRETARY OF STATE

NOTICE OF AGENCY APPROVAL OF A PROPOSED RULE
AND
FILING WITH THE LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

AGENCY: WV Environmental Quality Board TITLE NUMBER: 46

CITE AUTHORITY: 22B-3-4

AMENDMENT TO AN EXISTING RULE: YES X NO ___

IF YES, SERIES NUMBER OF RULE BEING AMENDED: One

TITLE OF RULE BEING AMENDED: Requirements GoverningWater Quality Standards

IF NO, SERIES NUMBER OF RULE BEING PROPOSED: ___

TITLE OF RULE BEING PROPOSED: ___

THE ABOVE PROPOSED LEGISLATIVE RULE HAVING GONE TO A PUBLIC HEARING OR A PUBLIC COMMENT PERIOD IS HEREBY APPROVED BY THE PROMULGATING AGENCY FOR FILING WITH THE SECRETARY OF STATE AND THE LEGISLATIVE RULE-MAKING REVIEW COMMITTEE FOR THEIR REVIEW.

Authorized Signature

$22.60

QUESTIONNAIRE

(Please include a copy of this form with each filing of your rule: Notice of Public Hearing or Comment Period; Proposed Rule, and if needed, Emergency and Modified Rule.)

DATE: December 20, 2001

TO: LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

FROM:(*Agency Name, Address & Phone No.*) West Virginia Environmental Quality Board
1615 Washington Street, East, Suite 301
Charleston, WV 25311

(304) 558-4002

LEGISLATIVE RULE TITLE: "Requirements Governing Water Quality Standards"

1. Authorizing statute(s) citation 22B-3-4

2. a. Date filed in State Register with Notice of Hearing or Public Comment Period:

October 19, 2001

b. What other notice, including advertising, did you give of the hearing?

Published in the Charleston Gazette on November 5, 2001. Published in the Charleston Daily Mail on November 8, 2001. Also distributed the Notice to our internal e-mail mailing list of approximately 125 people.

c. Date of Public Hearing(s) ***or*** Public Comment Period ended:

Public hearing - November 19, 2001. Written comments - November 26, 2001.

d. Attach list of persons who appeared at hearing, comments received, amendments, reasons for amendments.

Attached X No comments received _____

e. Date you filed in State Register the agency approved proposed Legislative Rule following public hearing: (be exact)

December 20, 2001

f. **Name, title, address and <u>phone/fax/e-mail numbers</u>** of agency person(s) to receive all *written correspondence* regarding this rule: (Please type)

Elizabeth Chatfield, Technical Advisor

1615 Washington Street, E., Suite 301

Charleston, WV 25311

Phone - (304) 558-4002, Fax - (304) 558-4116,
E-mail - lchatfield@aqbeqb.state.wv.us

g. **<u>IF DIFFERENT</u> FROM ITEM 'f'**, please give **Name, title, address and phone number(s)** of agency person(s) who wrote and/or has responsibility for the contents of this rule: (Please type)

Same

3. If the statute under which you promulgated the submitted rules requires certain findings and determinations to be made as a condition precedent to their promulgation:

a. Give the date upon which you filed in the State Register a notice of the time and place of a hearing for the taking of evidence and a general description of the issues to be decided.

N/A

b. Date of hearing or comment period:

N/A

c. On what date did you file in the State Register the findings and determinations required together with the reasons therefor?

N/A

d. Attach findings and determinations and reasons:

Attached N/A

46 CSR 1
Requirements Governing Water Quality Standards
December 20, 2001

Summary of Proposed Change

Revision to human health criterion for chloroform – Appendix E, Table 1, section 8.22 – Organics.

The change proposed herein amends the current numeric criterion for chloroform applicable to state waters designated as Public Water Supply (Category A). The current value for chloroform is 0.19 ug/liter; the proposed revised value is 5.7 ug/liter.

46 CSR 1
Requirements Governing Water Quality Standards
December 20, 2001

Statement of Circumstances Requiring Proposed Amendments

Revision to human health criterion for chloroform – Appendix E, Table 1, section 8.22 – Organics.

The change proposed herein amends the current numeric criterion for chloroform applicable to state waters designated as Public Water Supply (Category A). The current value for chloroform is 0.19 ug/liter; the proposed revised value is 5.7 ug/liter.

The proposed value of 5.7 ug/liter is the US Environmental Protection Agency's (US EPA) current recommended numeric criterion for chloroform for protection of human health from ingestion. West Virginia's 0.19 ug/l criterion is based on the value recommended in EPAs "Gold Book" of recommended criteria, titled Quality Criteria for Water, 1986 (EPA 440/5-86-0021). USEPA recalculated the criterion in 1989, based on new data, and published the revised criterion of 5.7 ug/l in a December 10, 1992 Federal Register notice.

A request for the revision of this criterion was made to the Board in a petition, dated September 10, 2001, received from the WV Chamber of Commerce, WV Manufacturers Association, WV Oil and Natural Gas Association, WV Rural Water Association, Independent Oil and Gas Association of WV and the WV Municipal Water Quality Association.

APPENDIX B

FISCAL NOTE FOR PROPOSED RULES

Rule Title: 46 CSR 1 Requirements Governing Water Quality Standards

Type of Rule: X Legislative ____ Interpretive ____ Procedural

Agency: WV Environmental Quality Board

Address: 1615 Washington St., E., Suite 301

Charleston, WV 25311-2126

1. Effect of Proposed rule:

	ANNUAL		FISCAL YEAR		
	INCREASE	DECREASE	CURRENT	NEXT	THEREAFTER
ESTIMATED TOTAL COST					
PERSONAL SERVICES					
CURRENT EXPENSE					
REPAIRS & ALTERATIONS					
EQUIPMENT					
OTHER					

2. Explanation of Above Estimates:

N/A

3. Objectives of These Rules:

To revise the numeric criterion for chloroform applicable to the public water supply designated use (Category A) from 0.19 ug/liter to 5.7 ug/liter.

Rule Title: 46 CSR 1 Requirements Governing Water Quality Standards

4. Explanation of Overall Economic Impact of Proposed Rule:

   A. Economic Impact on State Government:

      This change may improve instream compliance with the chloroform criterion in certain circumstances, thus avoiding the costs related to the listing of streams on the Clean Water Act 303(d) impaired waters list.*

   B. Economic Impact on Political Subdivisions; Specific Industries; Specific Groups of Citizens:

      This change is likely to reduce compliance costs for dischargers with effluent limits for chloroform.*

   C. Economic Impact on Citizens/Public at Large.

      None anticipated, aside from any related to those identified in A or B above.*
      *The Board is unable to quantify these impacts at this time.

Date: 12/20/01

Signature of Agency Head or Authorized Representative:

Elizabeth McClanahan

TITLE 46
LEGISLATIVE RULES
ENVIRONMENTAL QUALITY BOARD
SERIES 1
REQUIREMENTS GOVERNING WATER QUALITY STANDARDS

§46-1-1. General.

1.1. Scope. -- These rules establish requirements governing the discharge or deposit of sewage, industrial wastes and other wastes into the waters of the state and establish water quality standards for the waters of the State standing or flowing over the surface of the State. It is declared to be the public policy of the State of West Virginia to maintain reasonable standards of purity and quality of the water of the State consistent with (1) public health and public enjoyment thereof; (2) the propagation and protection of animal, bird, fish, and other aquatic and plant life; and (3) the expansion of employment opportunities, maintenance and expansion of agriculture and the provision of a permanent foundation for healthy industrial development. (See W. Va. Code §22-11-2.)

1.2. Authority. -- W. Va. Code §22B-3-4

1.3. Filing Date. --

1.4. Effective Date. -

§46-1-2. Definitions.

The following definitions in addition to those set forth in W. Va. Code §22-11-3, shall apply to these rules unless otherwise specified herein, or unless the context in which used clearly requires a different meaning:

2.1. "Ambient Concentration" is that measured value or level of water quality downstream of the proposed or existing activity (discharge point for point source, runoff area for nonpoint source) for any parameter of concern determined through EPA-approved, collection and analytical methods in 40 CFR 136 or other methods accepted by the Chief.

2.2. "Ambient Water Quality Conditions" (AWQC) are those physical, chemical, biological and radiological conditions of the receiving waters of the state existing at the time of review of a regulated activity.

2.3. "Baseline Water Quality" is that ambient concentration established at the time of an initial antidegradation review under rules effective May 17, 2001, for a stream or stream segment or any other water(s) of the state.

2.4. "Board" is the Environmental Quality Board.

2.5. "Chief" is the Chief of the Office of Water Resources of the West Virginia Division of Environmental Protection.

2.6. "Conventional treatment" is the treatment of water as approved by the West Virginia Bureau for Public Health to assure that the water is safe for human consumption.

2.7. "Cumulative" means a pollutant which increases in concentration in an organism by successive additions at different times or in different ways (bio-accumulation).

2.8. "Designated uses" are those uses specified in water quality standards for each water body or segment whether or not they are being attained. (See sections 6.2 - 6.6, herein)

2.9. "Director" is the Director of the West Virginia Division of Environmental Protection.

2.10. "Dissolved metal" is operationally defined as that portion of metal which passes through a 0.45 micron filter.

2.11. "Existing uses" are those uses actually attained in a water body on or after November 28, 1975, whether or not they are included in the water quality standards.

2.12. The "Federal Act" means the Clean Water Act (also known as the Federal Water Pollution Control Act) 33 U.S.C. § 1251 - 1387.

2.13. "High quality waters" are those waters whose quality is equal to or better than the minimum levels

necessary to achieve the national water quality goal uses.

2.14. "Intermittent streams" are streams which have no flow during sustained periods of no precipitation and which do not support aquatic life whose life history requires residence in flowing waters for a continuous period of at least six (6) months.

2.15. "Outstanding national resource waters" are those waters whose unique character, ecological or recreational value or pristine nature constitutes a valuable national or State resource.

2.16. "Natural" or "naturally occurring" values or "natural temperature" shall mean for all of the waters of the state:

2.16.a. Those water quality values which exist unaffected by -- or unaffected as a consequence of -- any water use by any person; and

2.16.b. Those water quality values which exist unaffected by the discharge, or direct or indirect deposit of, any solid, liquid or gaseous substance from any point source or non-point source.

2.17. "Non-point source" shall mean any source other than a point source from which pollutants may reach the waters of the state.

2.18. "Parameter of concern" means any parameter for which numeric water quality criteria have been adopted in 46 CSR 1 and any other parameter for which numeric criteria are not established but where the discharge of such parameter has a reasonable potential to either cause or contribute to a violation of the narrative criteria outlined under 46 CSR 1, section 3.

2.19. "Persistent" shall mean a pollutant and its transformation products which under natural conditions degrade slowly in an aquatic environment.

2.20. "Point source" shall mean any discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock or vessel or other floating

craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

2.21. "Reasonable less-degrading or non-degrading alternatives" shall be identified based on case specific information (as outlined in section 4C.4.a. of Appendix F, herein). Generally speaking, less-degrading or non-degrading pollution control alternatives shall be considered reasonable where the costs of such alternatives are less than 110% of the costs of the pollution control measures associated with the proposed activity.

2.22. "Regulated activity" includes 1) any activity that requires a permit or a water quality certification pursuant to state or federal law (e.g., Clean Water Act §402 NPDES permits, Clean Water Act §404 dredge and fill permits, or any activity requiring a Clean Water Act §401 certification), 2) any activity subject to nonpoint source control requirements or regulations, and 3) any activity which is otherwise subject to state requirements and regulations developed to protect water quality. The term "proposed activity" means a proposed activity that is also a regulated activity.

2.23. "Representative important species of aquatic life" shall mean those species of aquatic life whose protection and propagation will assure the sustained presence of a balanced aquatic community. Such species are representative in the sense that maintenance of water quality criteria will assure both the natural completion of the species' life cycles and the overall protection and sustained propagation of the balanced aquatic community.

2.24. The "State Act" or "State Law" shall mean the West Virginia Water Pollution Control Act, W. Va. Code §22-11-1.

2.25. "Total recoverable" refers to the digestion procedure for certain heavy metals as referenced in 40 CFR 136, as amended June 15, 1990, Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act.

2.26. "Trading" means establishing upstream controls for a parameter of concern to compensate for new or increased downstream sources for the same parameter resulting in

improved water quality for the parameter traded. More than one parameter of concern may be traded on a given stream. Trading may involve point sources, nonpoint sources or a combination of point and nonpoint sources. Unused permitted capacity cannot be traded.

2.27. "Trading Assessment Procedure" means methodologies to be used by the Director to document the basis for any trade allowed in sections 4B, 4C and 4D of Appendix F, herein, are EPA's Total Maximum Daily Load Procedures (40 CFR 130.2(i)), wasteload allocation procedures outlined in EPA's Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001 PB91-127415, March 1991), wasteload allocation methodologies outlined in EPA's Draft Framework for Watershed-Based Trading (EPA/800-R-96-001, May 1996) or other EPA approved wasteload allocation methodologies as long as these methodologies are consistent with the trading provisions of this rule.

2.28. "Trout waters" are streams or stream segments which sustain year-round trout populations. Excluded are those streams or stream segments which receive annual stockings of trout but which do not support year-round trout populations.

2.29. "Water of special concern" are those waters occurring in the categories outlined in section 4.1.c. of the antidegradation policy. This designation provides an intermediate level of antidegradation protection between high quality waters and outstanding national resource waters.

2.30 "Water quality criteria" shall mean levels of parameters or stream conditions that are required to be maintained by these regulations. Criteria may be expressed as a constituent concentration, levels, or narrative statement, representing a quality of water that supports a designated use or uses.

2.31. "Water quality standards" means the combination of water uses to be protected and the water quality criteria to be maintained by these rules.

2.32. "Wetlands" are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically

adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

2.33. "Wet weather streams" are streams that flow only in direct response to precipitation or whose channels are at all times above the water table.

§46-1-3. Conditions Not Allowable In State Waters.

3.1. Certain characteristics of sewage, industrial wastes and other wastes cause pollution and are objectionable in all waters of the state. Therefore, the Environmental Quality Board does hereby proclaim that the following general conditions are not to be allowed in any of the waters of the state.

3.2. No sewage, industrial wastes or other wastes present in any of the waters of the state shall cause therein or materially contribute to any of the following conditions thereof:

3.2.a. Distinctly visible floating or settleable solids, suspended solids, scum, foam or oily slicks;

3.2.b. Deposits or sludge banks on the bottom;

3.2.c. Odors in the vicinity of the waters;

3.2.d. Taste or odor that would adversely affect the designated uses of the affected waters;

3.2.e. Materials in concentrations which are harmful, hazardous or toxic to man, animal or aquatic life;

3.2.f. Distinctly visible color;

3.2.g. Concentrations of bacteria which may impair or interfere with the designated uses of the affected waters;

3.2.h. Requiring an unreasonable degree of treatment for the production of potable water by modern water treatment processes as commonly employed; and

3.2.i. Any other condition, including radiological exposure, which adversely alters the integrity of the waters of the State including wetlands; no significant adverse impact

to the chemical, physical, hydrologic, or biological components of aquatic ecosystems shall be allowed.

§46-1-4. Antidegradation Policy.

4.1. It is the policy of the State of West Virginia that the waters of the state shall be maintained and protected as follows:

4.1.a. Tier 1 Protection. Existing water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. Existing uses are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included as designated uses within these water quality standards.

4.1.b. Tier 2 Protection. The existing high quality waters of the state must be maintained at their existing high quality unless it is determined after satisfaction of the intergovernmental coordination of the state's continuing planning process and opportunity for public comment and hearing that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. If limited degradation is allowed, it shall not result in injury or interference with existing stream water uses or in violation of state or federal water quality criteria that describe the base levels necessary to sustain the national water quality goal uses of protection and propagation of fish, shellfish and wildlife and recreating in and on the water.

In addition, the Board and the Director shall assure that all new and existing point sources shall achieve the highest established statutory and regulatory requirements applicable to them and shall assure the achievement of cost-effective and reasonable best management practices (BMPs) for non-point source control. If BMPs are demonstrated to be inadequate to reduce or minimize water quality impacts, the Director may require that more appropriate BMPs be developed and applied.

4.1.b.1. High quality waters are those waters meeting the definition at section 2.13 herein and section 4E.1. of Appendix F, herein.

4.1.b.2. High quality waters may include but are not limited to the following:

4.1.b.2.A. Streams designated by the West Virginia Legislature under the West Virginia Natural Stream Preservation Act, pursuant to W. Va. Code §22-13-5; and

4.1.b.2.B. Streams listed in West Virginia High Quality Streams, Fifth Edition, prepared by the Wildlife Resources Division, Department of Natural Resources (1986).

4.1.b.2.C. Streams or stream segments which receive annual stockings of trout but which do not support year-round trout populations.

4.1.c. Tier 2.5 Protection. Waters of special concern include all of those waters listed in Appendix F-2 herein. Waters of special concern may include, but are not limited to naturally reproducing trout streams, federally designated rivers under the "Wild and Scenic Rivers Act," 16 U. S.C. §§ 1271 et seq., waters in state parks and forests, waters in National parks and forests, waters designated under the "National Parks and Recreation Act of 1978," and waters with unique or exceptional aesthetic, ecological, or recreational value. Waters may be nominated for inclusion in this category by any interested party or by the Board on its own initiative.

4.1.d. Tier 3 Protection. In all cases, waters which constitute an outstanding national resource shall be maintained and protected and improved where necessary. Outstanding national resource waters include, but are not limited to, all streams and rivers within the boundaries of Wilderness Areas designated by The Wilderness Act (16 U.S.C. §1131 et seq.) within the State.

Additional waters may be nominated for inclusion in that category by any interested party or by the Board on its own initiative. To designate a nominated water as an outstanding national resource water, the Board shall follow the public notice and hearing provisions as provided in 46 C.S.R. 6.

4.1.e. All applicable requirements of section 316(a) of the Federal Act shall apply to modifications of the temperature water quality criteria provided for in these rules.

§46-1-5. Mixing Zones.

5.1. In the permit review and planning process or upon the request of a permit applicant or permittee, the Chief may establish on a case-by-case basis an appropriate mixing zone.

5.2. The following guidelines and conditions are applicable to all mixing zones:

5.2.a. The Chief will assign, on a case-by-case basis, definable geometric limits for mixing zones for a discharge or a pollutant or pollutants within a discharge. Applicable limits shall include, but may not be limited to, the linear distances from the point of discharge, surface area involvement, volume of receiving water, and shall take into account other nearby mixing zones. Mixing zones shall take into account the mixing conditions in the receiving stream (i.e: whether complete or incomplete mixing conditions exist). Mixing zones will not be allowed until applicable limits are assigned by the Chief in accordance with this section.

5.2.b. Concentrations of pollutants which exceed the acute criteria for protection of aquatic life set forth in Appendix E, Table 1 shall not exist at any point within an assigned mixing zone or in the discharge itself unless a zone of initial dilution is assigned. A zone of initial dilution may be assigned on a case-by-case basis at the discretion of the Chief. The zone of initial dilution is the area within the mixing zone where initial dilution of the effluent with the receiving water occurs, and where the concentration of the effluent will be its greatest in the water column. Where a zone of initial dilution is assigned by the Chief, the size of the zone shall be determined using one of the four alternatives outlined in section 4.3.3 of US EPA's Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001 PB91-127415, March 1991). Concentrations of pollutants shall not exceed the acute criteria at the edge of the assigned zone of initial dilution. Chronic criteria for the protection of aquatic life may be exceeded within the mixing zone but shall be met at the edge of the assigned mixing zone.

5.2.c. Concentrations of pollutants which exceed the criteria for the protection of human health set forth in Appendix E, Table 1 shall not be allowed at any point unless a mixing zone has been assigned by the Chief after consultation with the Commissioner of the West Virginia Bureau for Public Health. Human health criteria may be exceeded within an

assigned mixing zone, but shall be met at the edge of the assigned mixing zone. Mixing zones for human health criteria shall be sized to prevent significant human health risks and shall be developed using reasonable assumptions about exposure pathways. In assessing the potential human health risks of establishing a mixing zone upstream from a drinking water intake, the Chief shall consider the cumulative effects of multiple discharges and mixing zones on the drinking water intake. No mixing zone for human health criteria shall be established on a stream which has a seven (7) day, ten (10) year return frequency of 5 cfs or less.

5.2.d. Mixing zones, including zones of initial dilution, shall not interfere with fish spawning or nursery areas or fish migration routes; shall not overlap public water supply intakes or bathing areas; cause lethality to or preclude the free passage of fish or other aquatic life; nor harm any threatened or endangered species, as listed in the Federal Endangered Species Act, 15 U.S.C. §1531 et seq.

5.2.e. The mixing zone shall not exceed one-third (1/3) of the width of the receiving stream, and in no case shall the mixing zone exceed one-half (1/2) of the cross-sectional area of the receiving stream.

5.2.f. In lakes and other surface impoundments, the volume of a mixing zone shall not affect in excess of ten (10) percent of the volume of that portion of the receiving waters available for mixing.

5.2.g. A mixing zone shall be limited to an area or volume which will not adversely alter the existing or designated uses of the receiving water, nor be so large as to adversely affect the integrity of the water body.

5.2.h. Mixing zones shall not:

5.2.h.1. Be used for, or considered as, a substitute for technology-based requirements of the Act and other applicable state and federal laws.

5.2.h.2. Extend downstream at any time a distance more than five times the width of the receiving watercourse at the point of discharge.

5.2.h.3. Cause or contribute to any of the

conditions prohibited in section 3, herein.

5.2.h.4. Be granted where instream waste concentration of a discharge is greater than 80%.

5.2.h.5. Overlap one another.

5.2.h.6. Overlap any 1/2 mile zone described in section 7.2.a.2 herein.

5.2.i. In the case of thermal discharges, a successful demonstration conducted under section 316(a) of the Act shall constitute compliance with all provisions of this section.

5.2.j. The Chief may waive the requirements of subsections 5.2.e and 5.2.h.2 above if a discharger provides an acceptable demonstration of:

5.2.j.1. Information defining the actual boundaries of the mixing zone in question; and

5.2.j.2. Information and data proving no violation of subsections 5.2.d and 5.2.g above by the mixing zone in question.

5.2.k. Upon implementation of a mixing zone in a permit, the permittee shall provide documentation that demonstrates to the satisfaction of the Chief that the mixing zone is in compliance with the provisions outlined in subsections 5.2.b, 5.2.c, 5.2.e, and 5.2.h.2, herein.

5.2.l. In order to facilitate a determination or assessment of a mixing zone pursuant to this section, the Chief may require a permit applicant or permittee to submit such information as deemed necessary.

§46-1-6. Water Use Categories.

6.1. These rules establish general Water Use Categories and Water Quality Standards for the waters of the State. Unless otherwise designated by these rules, at a minimum all waters of the State are designated for the Propagation and Maintenance of Fish and Other Aquatic Life (Category B) and for Water Contact Recreation (Category C) consistent with Federal Act goals. Incidental utilization for whatever

purpose may or may not constitute a justification for assignment of a water use category to a particular stream segment.

6.1.a. Waste assimilation and transport are not recognized as designated uses. The classification of the waters must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation.

Subcategories of a use may be adopted and appropriate criteria set to reflect varying needs of such subcategories of uses, for example to differentiate between trout water and other waters.

6.1.b. At a minimum, uses are deemed attainable if they can be achieved by the imposition of effluent limits required under section 301(b) and section 306 of the Federal Act and use of cost-effective and reasonable best management practices for non-point source control. Seasonal uses may be adopted as an alternative to reclassifying a water body or segment thereof to uses requiring less stringent water quality criteria. If seasonal uses are adopted, water quality criteria will be adjusted to reflect the seasonal uses; however, such criteria shall not preclude the attainment and maintenance of a more protective use in another season. A designated use which is not an existing use may be removed, or subcategories of a use may be established if it can be demonstrated that attaining the designated use is not feasible because:

6.1.b.1. Application of effluent limitations for existing sources more stringent than those required pursuant to section 301 (b) and section 306 of the Federal Act in order to attain the existing designated use would result in substantial and widespread adverse economic and social impact; or

6.1.b.2. Naturally-occurring pollutant concentrations prevent the attainment of the use; or

6.1.b.3. Natural, ephemeral, intermittent or low flow conditions of water levels prevent the attainment of the use, unless these conditions may be compensated for by the

discharge of sufficient volume of effluent discharges to enable uses to be met; or

6.1.b.4. Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

6.1.b.5. Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

6.1.b.6. Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses.

6.1.c. The State shall take into consideration the quality of downstream waters and shall assure that its water quality standards provide for the attainment of the water quality standards of downstream waters.

6.1.d. In establishing a less restrictive use or uses, or subcategory of use or uses, and the water quality criteria based upon such uses, the Board shall follow the requirements for revision of water quality standards as required by W. Va. Code §22B-3-4 and section 303 of the Federal Act and the regulations thereunder. Any revision of water quality standards shall be made with the concurrence of EPA. The Board's administrative procedural regulations for applying for less restrictive uses or criteria shall be followed.

6.2. Category A -- Water Supply, Public. -- This category is used to describe waters which, after conventional treatment, are used for human consumption. This category includes streams on which the following are located:

6.2.a. All community domestic water supply systems;

6.2.b. All non-community domestic water supply systems, (i.e. hospitals, schools, etc.);

6.2.c. All private domestic water systems;

6.2.d. All other surface water intakes where the water is used for human consumption. (See Appendix B for partial listing of Category A waters; see section 7.2.a.2, herein for additional requirements for Category A waters.) The manganese human health criteria shall not apply where the discharge point of the manganese is located more than five miles upstream from a known drinking water source.

6.3. Category B -- Propagation and maintenance of fish and other aquatic life. --

This category includes:

6.3.a. Category B1 -- Warm water fishery streams. -- Streams or stream segments which contain populations composed of all warm water aquatic life.

6.3.b. Category B2 -- Trout Waters. -- As defined in section 2.28, herein (See Appendix A for a representative list.)

6.3.c. Category B4 -- Wetlands. -- As defined in section 2.32, herein; certain numeric stream criteria may not be appropriate for application to wetlands (see Appendix E, Table 1).

6.4. Category C -- Water contact recreation. -- This category includes swimming, fishing, water skiing and certain types of pleasure boating such as sailing in very small craft and outboard motor boats. (See Appendix D for a representative list of category C waters.)

6.5. Category D. -- Agriculture and wildlife uses.

6.5.a. Category D1 -- Irrigation. -- This category includes all stream segments used for irrigation.

6.5.b. Category D2 -- Livestock watering. -- This category includes all stream segments used for livestock watering.

6.5.c. Category D3 -- Wildlife. -- This category includes all stream segments and wetlands used by wildlife.

6.6. Category E -- Water supply industrial, water transport, cooling and power. -- This category includes cooling water, industrial water supply, power production, commercial and pleasure vessel activity, except those small craft included in Category C.

6.6.a. Category E1 -- Water Transport. -- This category includes all stream segments modified for water transport and having permanently maintained navigation aides.

6.6.b. Category E2 -- Cooling Water. -- This category includes all stream segments having one (1) or more users for industrial cooling.

6.6.c. Category E3 -- Power production. -- This category includes all stream segments extending from a point 500 feet upstream from the intake to a point one half (1/2) mile below the wastewater discharge point. (See Appendix C for representative list.)

6.6.d. Category E4 -- Industrial. -- This category is used to describe all stream segments with one (1) or more industrial users. It does not include water for cooling.

§46-1-7. West Virginia Waters.

7.1. Major River Basins and their Alphanumeric System. All streams and their tributaries in West Virginia shall be individually identified using an alphanumeric system as identified in the "Key to West Virginia Stream Systems and Major Tributaries" (1956) as published by the Conservation Commission of West Virginia and revised by the West Virginia Department of Natural Resources, Division of Wildlife (1985).

7.1.a. J - James River Basin. All tributaries to the West Virginia - Virginia State line.

7.1.b. P - Potomac River Basin. All tributaries of the main stem of the Potomac River to the West Virginia - Maryland - Virginia State line to the confluence of the North Branch and the South Branch of the Potomac River and all tributaries arising in West Virginia excluding the major tributaries hereinafter designated:

7.1.b.1. S - Shenandoah River and all its

tributaries arising in West Virginia to the West Virginia - Virginia State line.

7.1.b.2. PC - Cacapon River and all its tributaries.

7.1.b.3. PSB - South Branch and all its tributaries.

7.1.b.4. PNB - North Branch and all tributaries to the North Branch arising in West Virginia.

7.1.c. M - Monongahela River Basin. The Monongahela River Basin main stem and all its tributaries excluding the following major tributaries which are designated as follows:

7.1.c.1. MC - Cheat River and all its tributaries except those listed below:

7.1.c.1.A. MCB - Blackwater River and all its tributaries.

7.1.c.2. MW - West Fork River and all its tributaries.

7.1.c.3. MT - Tygart River and all its tributaries except those listed below:

7.1.c.3.A. MTB - Buckhannon River and all its tributaries.

7.1.c.3.B. MTM - Middle Fork River and all its tributaries.

7.1.c.4. MY - Youghigheny River and all its tributaries to the West Virginia - Maryland State line.

7.1.d. O Zone 1 - Ohio River - Main Stem. The main stem of the Ohio River from the Ohio - Pennsylvania - West Virginia state line to the Ohio - Kentucky - West Virginia State line.

7.1.e. O Zone 2 - Ohio River - Tributaries. All tributaries of the Ohio River excluding the following major tributaries:

7.1.e.1. LK - Little Kanawha River. The Little Kanawha River and all its tributaries excluding the following major tributary which is designated as follows:

7.1.e.1.A. LKH - Hughes River and all its tributaries.

7.1.e.2. K - Kanawha River Zone 1. The main stem of the Kanawha River from mile point 0, at its confluence with the Ohio River, to mile point 72 near Diamond, West Virginia.

7.1.e.3. K - Kanawha River Zone 2. The main stem of the Kanawha River from mile point 72 near Diamond, West Virginia and all its tributaries from mile point 0 to the headwaters excluding the following major tributaries which are designated as follows:

7.1.e.3.A. KP - Pocatalico River and all its tributaries.

7.1.e.3.B. KC - Coal River and all its tributaries.

7.1.e.3.C. KE - Elk River and all its tributaries.

7.1.e.3.D. KG - Gauley River. The Gauley River and all its tributaries excluding the following major tributaries which are designated as follows:

7.1.e.3.D.1. KG-19 - Meadow River and all its tributaries.

7.1.e.3.D.2. KG-34 - Cherry River and all its tributaries.

7.1.e.3.D.3. KGC - Cranberry River and all its tributaries.

7.1.e.3.D.4. KGW - Williams River and all its tributaries.

7.1.e.3.E. KN - New River. The New River from its confluence with the Gauley River to the

Virginia - West Virginia State line and all tributaries excluding the following major tributaries which are designated as follows:

7.1.e.3.E.1. KNG - Greenbrier River and all its tributaries.

7.1.e.3.E.2. KNB - Bluestone River and all its tributaries.

7.1.e.3.E.3. KN-60 - East River and all its tributaries.

7.1.e.3.E.4. K(L)-81-(1) - Bluestone Lake.

7.1.e.4. OG - Guyandotte River. The Guyandotte River and all its tributaries excluding the following major tributary which is designated as follows:

7.1.e.4.1. OGM - Mud River and all its tributaries.

7.1.e.5. BS - Big Sandy River. The Big Sandy River to the Kentucky - Virginia - West Virginia State lines and all its tributaries arising in West Virginia excluding the following major tributary which is designated as follows:

7.1.e.5.1 BST - Tug Fork and all its tributaries.

7.2. Applicability of Water Quality Standards. The following shall apply at all times unless a specific exception is granted in this section:

7.2.a. Water Use Categories as described in section 6, herein.

7.2.a.1. Based on meeting those Section 6 definitions, tributaries or stream segments may be classified for one or more Water Use Categories. When more than one use exists, they shall be protected by criteria for the use category requiring the most stringent protection.

7.2.a.2. Each segment extending upstream from the intake of a water supply public (Water Use Category A),

for a distance of one half (1/2) mile or to the headwater, must be protected by prohibiting the discharge of any pollutants in excess of the concentrations designated for this Water Use Category in section 8, herein. In addition, within that one half (1/2) mile zone, the Chief may establish for any discharge, effluent limitations for the protection of human health that require additional removal of pollutants than would otherwise be provided by this rule. (If a watershed is not significantly larger than this zone above the intake, the water supply section may include the entire upstream watershed to its headwaters.) Until June 30, 2003, the one-half mile zone described in this section shall not apply to the Ohio River main channel (between Brown's Island and the left descending bank) between river mile points 61.0 and 63.5.

7.2.b. In the absence of any special application or contrary provision, water quality standards shall apply at all times when flows are equal to or greater than the minimum mean seven (7) consecutive day drought flow with a ten (10) year return frequency (7Q10). NOTE: With the exception of section 7.2.c.5 listed herein exceptions do not apply to trout waters nor to the requirements of section 3, herein.

7.2.c. Exceptions: Numeric water quality standards shall not apply: (See section 7.2.d, herein, for site-specific revisions)

7.2.c.1. When the flow is less than 7Q10;

7.2.c.2. In wet weather streams (or intermittent streams, when they are dry or have no measurable flow): Provided, That the existing and designated uses of downstream waters are not adversely affected;

7.2.c.3. In any assigned zone of initial dilution of any mixing zone where a zone of initial dilution is required by section 5.2.b herein, or in any assigned mixing zone for human health criteria or aquatic life criteria for which a zone of initial dilution is not assigned; In zones of initial dilution and certain mixing zones: Provided, That all requirements described in section 5 herein shall apply to all zones of initial dilution and all mixing zones;

7.2.c.4. Where, on the basis of natural conditions, the Board has established a site-specific aquatic life water quality criterion that modifies a water quality

criterion set out in Appendix E, Table 1 of this rule. Where a natural condition of a waterbody is demonstrated to be of lower quality than a water quality criterion for the use classes and subclasses in section 6 of this rule, the Board, in its discretion, may establish a site-specific water quality criterion for aquatic life. This alternate criterion may only serve as the chronic criterion established for that parameter. This alternate criterion must be met at end of pipe. Where the Board decides to establish a site-specific water quality criterion for aquatic life, the natural condition constitutes the applicable water quality criterion. A site-specific criterion for natural conditions may only be established through the legislative rulemaking process in accordance with W.Va. Code §29A-3-1 et seq. and must satisfy the public participation requirements set forth at 40 C.F.R. 131.20 and 40 C.F.R. Part 25. Site-specific criteria for natural conditions may be established only for aquatic life criteria. A public notice, hearing and comment period is required before site-specific criteria for natural conditions are established.

Upon application or on its own initiative, the Board will determine whether a natural condition of a waterbody should be approved as a site-specific water quality criterion. Before it approves a site-specific water quality criterion for a natural condition, the Board must find that the natural condition will fully protect existing and designated uses and ensure the protection of aquatic life. If a natural condition of a waterbody varies with time, the natural condition will be determined to be the actual natural condition of the waterbody measured prior to or concurrent with discharge or operation. The Board will, in its discretion, determine a natural condition for one or more seasonal or shorter periods to reflect variable ambient conditions; and require additional or continuing monitoring of natural conditions.

An application for a site-specific criterion to be established on the basis of natural conditions shall be filed with the Board and shall include the following information:

7.2.c.4.A. A U.S.G.S. 7.5 minute map showing the stream segment affected and showing all existing discharge points and proposed discharge point;

7.2.c.4.B. The alphanumeric code of the affected stream, if known;

7.2.c.4.C. Water quality data for the stream or stream segment. Where adequate data are unavailable, additional studies may be required by the Board;

7.2.c.4.D. General land uses (e.g. mining, agricultural, recreation, residential, commercial, industrial, etc.) as well as specific land uses adjacent to the waters for the affected segment or stream;

7.2.c.4.E. The existing and designated uses of the receiving waters into which the segment in question discharges and the location where those downstream uses begin to occur;

7.2.c.4.F. General physical characteristics of the stream segment, including, but not limited to width, depth, bottom composition and slope;

7.2.c.4.G. Conclusive information and data of the source of the natural condition that causes the stream to exceed the water quality standard for the criterion at issue.

7.2.c.4.H. The average flow rate in the segment and the amount of flow at a designated control point and a statement regarding whether the flow of the stream is ephemeral, intermittent or perennial;

7.2.c.4.I. An assessment of aquatic life in the stream or stream segment in question and in the adjacent upstream and downstream segments; and

7.2.c.4.J. Any additional information or data that the Board deems necessary to make a decision on the application.

7.2.c.5. For the upper Blackwater River from the mouth of Yellow Creek to a point 5.1 miles upstream, when flow is less than 7Q10. Naturally occurring values for Dissolved Oxygen as established by data collected by the dischargers within this reach and reviewed by the Board and Division of Environmental Protection shall be the applicable criteria.

7.2.d. Site-specific applicability of water use

categories and water quality criteria - State-wide water quality standards shall apply except where site-specific numeric criteria, variances or use removals have been approved following application and hearing, as provided in 46 C.S.R. 6. (See section 8.3 and section 8.4, herein) The following are approved site-specific criteria, variances and use reclassifications:

7.2.d.1. James River - (Reserved)

7.2.d.2. Potomac River

7.2.d.2.1. Except that a site-specific numeric criterion for aluminum, not to exceed 500 ug/l, shall apply to the section of Opequon Creek from Turkey Run to the Potomac River.

7.2.d.3. Shenandoah River - (Reserved)

7.2.d.4. Cacapon River - (Reserved)

7.2.d.5. South Branch - (Reserved)

7.2.d.6. North Branch

7.2.d.6.1 Except that the Stony River downstream from the limit of the thermal mixing zone (as established by Board Order of 11/20/75) for the Mount Storm Lake wastewater treatment facility to its confluence with the North Branch of the Potomac River is exempt from the 5°F above natural temperature rise; however, the maximum temperature outside the mixing zone shall not exceed 87°F at any time during the months of May through November and not exceed 73°F at any time during the months of December through April. This exception shall apply until the successful completion of a study conducted pursuant to section 316(a) of the Federal Act or December 31, 1998, whichever comes first.

7.2.d.7. Monongahela River

7.2.d.7.1. Except that flow in the main stem of the Monongahela River, as regulated by the Tygart Reservoir, operated by the U. S. Army Corps of Engineers, is based on a minimum flow of 345 cfs at Lock and Dam No. 8, river mile point 90.8. This exception does not apply to tributaries of the Monongahela River.

7.2.d.8. Cheat River

7.2.d.8.1. Except that in the unnamed tributary of Daugherty Run, approximately one mile upstream of Daugherty Run's confluence with the Cheat River, a site-specific numeric criterion for iron of 3.5 mg/l shall apply and the following frequency and duration requirements shall apply to the chronic numeric criterion for selenium (5ug/l): the four-day average concentration shall not be exceeded more than three times every three years (36 months), on average. Further, the following site-specific numeric criteria shall apply to Fly Ash Run of Daugherty Run: acute numeric criterion for aluminum: 888.5 ug/l and manganese: 5 mg/l.

7.2.d.9. Blackwater River - The Blackwater River below Davis, West Virginia shall be classified as a trout water, Category B2.

7.2.d.10. West Fork River - (Reserved)

7.2.d.11. Tygart River - (Reserved)

7.2.d.12. Buckhannon River - (Reserved)

7.2.d.13. Middle Fork River - (Reserved)

7.2.d.14. Youghiogheny River

7.2.d.14.1 Water Use Categories A and E are excluded from the tributaries of the Youghiogheny River in West Virginia which flow into Maryland.

7.2.d.15. Ohio River Main Stem - (Reserved)

7.2.d.16. Ohio River Tributaries.

7.2.d.16.1. Except that site-specific numeric criteria shall apply to the stretch of Conners Run (0-77-A), a tributary of Fish Creek, from its mouth to the discharge from Conner Run impoundment, which shall not have the Water Use Category A and may contain selenium not to exceed 62 ug/1; and iron not to exceed 3.5 mg/1 as a monthly average and 7 mg/1 as a daily maximum.

7.2.d.16.2. Except that a socio-

economic variance shall apply to that segment of Harmon Creek (0-97) from its confluence with the Ohio River to a point 2.2 miles upstream, which shall not have water use Category A designation, and which shall have the following instream criteria: Lead 14 ug/l, Daily Maximum, Zinc 181 ug/l, Daily Maximum, Temperature 100 degree F (monitored per Footnote 12 of the permit); Iron 4.0 mg/l, Monthly Average and 8.0 mg/l, Daily Maximum (monitored per Footnote 12 of the permit). Provided, however, that the criteria for Lead, Zinc, Temperature and Iron shall not apply, and instead the state-wide criteria for these parameters shall apply, unless: Weirton Steel Corporation (1) submits to the Office of Water Resources on or before January 31, 2001 a report setting forth the water quality of the discharge from Outlet 004 for these parameters during calendar year 2000; (2) offers further proposals for any appropriate reductions in the above excepted levels; (3) provides any appropriate additional engineering analysis of potential alternatives for reducing further the concentrations of said parameters in the discharge toward achieving statewide criteria; and (4) continues to submit to the Office of Water Resources on a semi-annual basis, summary reports on the water quality of the discharge from Outlet 004 and the efforts made by Weirton Steel Corporation during the prior six (6) months to improve the quality of said discharge. Additionally Weirton Steel must determine the water quality of Harmon Creek both immediately upstream of and below the discharge of outlet 004 at the Con Rail Bridge by sampling for Flow, pH, Total and Dissolved Lead, Total and Dissolved Zinc, Iron, Fluoride, Temperature, Turbidity, Oil and Grease and Hardness on at least a monthly basis and submit the results to the Office of Water Resources with the semi-annual report. These exceptions shall be in effect until action by the Environmental Quality Board to revise such exceptions or until June 29, 2004, whichever comes first.

7.2.d.17. Little Kanawha River - (Reserved)

7.2.d.18. Hughes River - (Reserved)

7.2.d.19. Kanawha River Zone 1 - Main Stem

7.2.d.19.1 For the Kanawha River main stem, Zone 1, Water Use Category A shall not apply; and

7.2.d.19.2. The minimum flow shall be 1,960 cfs at the Charleston gauge.

7.2.d.20. Kanawha River Zone 2 and Tributaries.

7.2.d.20.1. For the main stem of the Kanawha River only, the minimum flow shall be 1,896 cfs at mile point 72.

7.2.d.20.2. Except the stretch between the mouth of Little Scary Creek (K-31) and the Little Scary impoundment shall not have Water Use Category A. The following site-specific numeric criteria shall apply to that section: selenium not to exceed 62 ug/1 and copper not to exceed 105 ug/1 as a daily maximum nor 49 ug/1 as a 4-day average.

7.2.d.20.3. Except for Simmons Creek (K-54) from its mouth to a point 1200 feet upstream to which the following site-specific numeric criteria shall apply: a maximum daily temperature not to exceed 38°C (100°F) nor a monthly average temperature to exceed 34°C. This exception shall apply until the successful completion of a study conducted pursuant to section 316(a) of the Federal Act or May 30, 1998, whichever comes first.

7.2.d.21. Pocatalico River - (Reserved)

7.2.d.22. Coal River - (Reserved)

7.2.d.23. Elk River - (Reserved)

7.2.d.24. Gauley River - (Reserved)

7.2.d.25. Meadow River - (Reserved)

7.2.d.26. Cherry River - (Reserved)

7.2.d.27. Cranberry River - (Reserved)

7.2.d.28. Williams River - (Reserved)

7.2.d.29. New River - (Reserved)

7.2.d.30. Greenbrier River - (Reserved)

7.2.d.31. Bluestone River - (Reserved)

7.2.d.32. Bluestone Lake

7.2.d.33. East River - (Reserved)

7.2.d.34. Guyandotte River - (Reserved)

7.2.d.35. Mud River - (Reserved)

7.2.d.36. Big Sandy River - (Reserved)

7.2.d.37. Tug Fork River - (Reserved)

§46-1-8. Specific Water Quality Criteria.

8.1. Charts of specific water quality criteria are included in Appendix E, Table 1.

8.1.a. Specific state (i.e. total, total recoverable, dissolved, valence, etc.) of any parameter to be analyzed shall follow 40 CFR 136, Guidelines Establishing Test Procedures for Analysis of Pollutants Under the Clean Water Act, as amended, June 15, 1990. (See also 47 C.S.R. 10, section 7.3 - National Pollutant Discharge Elimination System (NPDES) Program.)

8.1.b. Compliance with aquatic life water quality criteria expressed as dissolved metal shall be determined based on dissolved metals concentrations.

8.1.b.1. The aquatic life criteria for all metals listed in Appendix E, Table 2 shall be converted to a dissolved concentration by multiplying each numerical value or criterion equation from Appendix E, Table 1 by the appropriate conversion factor (CF) from Appendix E, Table 2.

8.1.b.2. Permit limits based on dissolved metal water quality criteria shall be prepared in accordance with the U.S. EPA document "The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion, EPA 823-B-96-007 June 1996.

8.1.b.3. NPDES permit applicants may petition the Office of Water Resources of the Division of Environmental Protection (OWR) to develop a site-specific translator consistent with the provisions in this section. The OWR may, on a case-by-case basis require an applicant applying for a

translator to conduct appropriate sediment monitoring through SEM/AVS ratio, bioassay or other approved methods to evaluate effluent limits that prevent toxicity to aquatic life.

8.1.c. An "X" or numerical value in the use columns of Appendix E, Table 1 shall represent the applicable criteria.

8.1.d. Charts of water quality criteria in Appendix E, Table 1 shall be applied in accordance with major stream and use applications, sections 6 and 7, herein.

8.2. Criteria for Toxicants

8.2.a. Toxicants which are carcinogenic have human health criteria (Water Use Categories A and C) based upon an estimated risk level of one additional cancer case per one million persons (10^{-6}) and are indicated in Appendix E, Table 1 with an endnote (^{b}).

8.2.b. A final determination on the critical design flow for carcinogens is not made in this rule, in order to permit further review and study of that issue. Following the conclusion of such review and study, the Legislature may again take up the authorization of this rule for purposes of addressing the critical design flow for carcinogens: Provided, That until such time as the review and study of the issue is concluded or until such time as the Legislature may again take up the authorization of this rule, the regulatory requirements for determining effluent limits for carcinogens shall remain as they were on the date this rule was proposed.

8.3. Variances from Specific Water Quality Criteria. A variance from numeric criteria may be granted to a discharger if it can be demonstrated that the conditions outlined in subsections 6.1.b.A - F, herein, limit the attainment of one or more specific water quality criteria. Variances shall apply only to the discharger to whom they are granted and shall be reviewed by the Board at least every three years. In granting a variance, the requirements for revision of water quality standards in 46 CSR 6 shall be followed.

8.4. Site-specific numeric criteria. The Board may establish numeric criteria different from those set forth in Appendix E, Table 1 for a stream or stream segment upon a demonstration that existing numeric criteria are either over-

protective or under-protective of the aquatic life residing in the stream or stream segment. A site-specific numeric criterion will be established only where the numeric criterion will be fully protective of the aquatic life and the existing and designated uses in the stream or stream segment. The site-specific numeric criterion may be established by conducting a Water Effect Ratio study pursuant to the procedures outlined in US EPA's "Interim Guidance on the Determination and Use of Water-Effect Ratios for Metals" (February 1994); other methods may be used with prior approval by the Board. In adopting site-specific numeric criteria, the requirements for revision of water quality standards set forth in 46 CSR 6 shall be followed.

§46-1-9. Establishment Of Safe Concentration Values.

When a specific water quality standard has not been established by these rules and there is a discharge or proposed discharge into waters of the State, the use of which has been designated a Category B1, B2, B3 or B4, such discharge may be regulated by the Chief where necessary to protect State waters through establishment of a safe concentration value as follows:

9.1. Establishment of a safe concentration value shall be based upon data obtained from relevant aquatic field studies, standard bioassay test data which exists in substantial available scientific literature, or data obtained from specific tests utilizing one (1) or more representative important species of aquatic life designated on a case-by-case basis by the Chief and conducted in a water environment which is equal to or closely approximates that of the natural quality of the receiving waters.

9.2. In those cases where it has been determined that there is insufficient available data to establish a safe concentration value for a pollutant, the safe concentration value shall be determined by applying the appropriate application factor as set forth below to the 96-hour LC 50 value. Except where the Chief determines, based upon substantial available scientific data that an alternate application factor exists for a pollutant, the following appropriate application factors shall be used in the determination of safe concentration values:

9.2.a. Concentrations of pollutants or combinations

of pollutants that are not persistent and not cumulative shall not exceed 0.10 (1/10) of the 96-hour LC 50.

9.2.b. Concentrations of pollutants or combinations of pollutants that are persistent or cumulative shall not exceed 0.01 (1/100) of the 96-hour LC 50.

9.3. Persons seeking issuance of a permit pursuant to these rules authorizing the discharge of a pollutant for which a safe concentration value is to be established using special bioassay tests pursuant to subsection 9.1 of this section shall perform such testing as approved by the Chief and shall submit all of the following in writing to the Chief:

9.3.a. A plan proposing the bioassay testing to be performed.

9.3.b. Such periodic progress reports of the testing as may be required by the Chief.

9.3.c. A report of the completed results of such testing including, but not limited to, all data obtained during the course of testing, and all calculations made in the recording, collection, interpretation and evaluation of such data.

9.4. Bioassay testing shall be conducted in accordance with methodologies outlined in the following documents: U.S. EPA Office of Research and Development Series Publication, Methods for Measuring the Acute Toxicity (EPA/600/4-90/027F, August 1993, 4th Edition) or Short Term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/600/4-89/001), March 1989; Standard Methods for the Examination of Water and Wastewater (18th Edition); or ASTM Practice E 729-88 for Conducting Acute Toxicity Tests with Fishes, Macroinvertebrates and Amphibians as published in Volume 11.04 of the 1988 Annual Book of ASTM Standards. Test waters shall be reconstituted according to recommendations and methodologies specified in the previously cited references or methodologies approved in writing by the Chief.

APPENDIX A
CATEGORY B-2 - TROUT WATERS

This list contains known trout waters and is not intended to exclude any waters which meet the definition in Section 2.28.

River Basin	County	Stream
James River		
J	Monroe	South Fork Potts Creek
Potomac River		
P	Jefferson	Town Run
P	"	Rocky Marsh Run
P	Berkeley	Opequon Creek
P	"	Tuscarora Creek (Above Martinsburg)
P	"	Middle Creek (Above Route 30 Bridge)
P	"	Mill Creek
P	"	Hartland Run
P	"	Mill Run
P	"	Tillance Creek
P	Morgan	Meadow Branch
PS	Jefferson	Flowing Springs Run (Above Halltown)
PS	"	Cattail Run
PS	"	Evitt's Run
PS	"	Big Bullskin Run
PS	"	Long Marsh Run
PC	Hampshire	Cold Stream
PC	"	Edwards Run and Impoundment
PC	"	Dillons Run
PC	Hardy	Lost River
PC	"	Camp Branch
PC	"	Lower Cove Run
PC	"	Moores Run
PC	"	North River (Above Rio)
PC	"	Waites Run
PC	"	Trout Run
PC	"	Trout Pond (Impoundment)
PC	"	Warden Lake (Impoundment)
PC	"	Rock Cliff Lake (Impoundment)
PSB	Hampshire	Mill Creek
PSB	"	Mill Run
PSB	Hardy	Dumpling Creek
PSB	Grant-Pendleton	North Fork South Branch
PSB	Grant	North Fork Lunice Creek
PSB	"	South Fork Lunice Creek
PSB	"	South Mill Creek (Above

Hiser)		
PSB	"	Spring Run
PSB	Pendleton	Hawes Run (Impoundment)
PSB	"	Little Fork
PSB	"	South Branch (Above North Fork)
PSB	"	Senena Creek
PSB	"	Laurel Fork
PSB	"	Big Run
PNB	Mineral	North Fork Patterson Creek
PNB	"	Fort Ashby (Impoundment)
PNB	"	New Creek
PNB (Impoundment)	"	New Creek Dam 14
PNB	"	Mill Creek (Above Markwood)
Monongahela River		
M Smithtown)	Monongalia-Marion	Whiteday Creek (Above
MC	Monongalia	Morgan Run
MC	"	Coopers Rock (Impoundment)
MC	"	Blaney Hollow
MC	Preston	Laurel Run
MC	"	Elsey Run
MC	"	Saltlick Creek
MC	"	Buffalo Creek
MC	"	Wolf Creek
MC	Tucker	Clover Run
MC	"	Elklick Run
MC	"	Horseshoe Run
MC	"	Maxwell Run
MC	"	Red Creek
MC	"	Slip Hill Mill Branch
MC	"	Thomas Park (Impoundment)
MC Davis)	"	Blackwater River (Above
MC	"	Blackwater River (Below Davis) (insert date adopted)
MC	Randolph	Camp Five Run
MC Creek)	"	Dry Fork (Above Otter
MC	"	Glady Fork
MC	"	Laurel Fork
MC	"	Gandy Creek (Above Whitmer)
MC C & P	"	East Fork Glady Fork (Above Compressor Station)
MC Black Fork)	Randolph	Shavers Fork (Above Little
MC	"	Three Spring Run
MC	"	Spruce Knob Lake

(Impoundment)

MW	Harrison	Dog Run (Pond)
MW	Lewis	Stonecoal
MT	Barbour	Brushy Fork (Above Valley Furnace)
MT	"	Teter Creek Lake (Impoundment)
MT	"	Mill Run
MT	Taylor-Barbour	Tygart Lake Tailwaters (Above Route 119 Bridge)
MT	Preston	Roaring Creek (Above Little Lick Branch)
MT	Randolph	Tygart River (Above Huttonsville)
MT	"	Elkwater Fork
MT	"	Big Run
MTB	Upshur-Randolph-Lewis	Right Fork Buckhannon River
MTB	Upshur	Buckhannon River (Above Beans Mill)
MTB	Upshur	French Creek
MTB	Upshur-Randolph	Left Fork Right Fork
MTN	Upshur	Right Fork Middle Fork River
MTM	Randolph	Middle Fork River (Above Cassity)
MY	Preston	Rhine Creek

Little Kanawha River

LK	Upshur	Left Fork-Right Fork Little Kanawha River)
LK	Upshur-Lewis	Little Kanawha River (Above Wildcat)

Kanawha River

KE	Braxton	Sutton Reservoir
KE	"	Sutton Lake Tailwaters (Above Route 38/5 Bridge)
KE	Webster	Back Fork
KE	"	Desert Fork
KE	"	Fall Run
KE	"	Laurel Fork
KE	"	Left Fork Holly River
KE	"	Sugar Creek
KE	"	Elk River (Above Webster Springs)
KC	Raleigh	Stephens Lake (Impoundment)

KC	"	Marsh Fork (Above Sundial)
KG	Nicholas	Summersville Reservoir (Impoundment)
KG	"	Summersville Tailwaters (Above Collison Creek)
KG	Nicholas	Deer Creek
KG	Randolph-Webster	Gauley River (Above Moust Coal Tipple)
KG	Fayette	Glade Creek
KG	Nicholas	Hominy Creek
KG	"	Anglins Creek
KG	Greenbrier	Big Clear Creek
KG	"	Little Clear Creek and Laurel Run
KG	"	Meadow Creek
KG	Fayette	Wolf Creek
KG	Nicholas	Cherry River
KG	Greenbrier-Nicholas	Laurel Creek
KG	" "	North Fork Cherry River
KG	Greenbrier	Summit Lake (Impoundment)
KG	Greenbrier-Nicholas	South Fork Cherry River
KGC	Pocahontas-Webster-Nicholas	Cranberry River
KGC	Pocahontas	South Fork Cranberry River
KGW	Pocahontas	Tea Creek
KGW	Pocahontas-Webster	Williams River (Above Dyer)
KN	Raleigh	Glade Creek
KN	Summers	Meadow Creek
KN	Fayette	Mill Creek
KN	"	Laurel Creek (Above Cotton Hill)
KN	Raleigh	Pinch Creek
KN	Monroe	Rich Creek
KN	"	Turkey Creek
KN	Fayette	Dunloup Creek (Downstream from Harvey Sewage Treatment Plant)
KN	Mercer	East River (Above Kelleysville)
KN	"	Pigeon Creek
KN	Monroe	Laurel Creek
KNG	Monroe	Kitchen Creek (Above Gap Mills)
KNG	Greenbrier	Culverson Creek
KNG	"	Milligan Creek
KNG	Greenbrier-Monroe	Second Creek (Rt. 219 Bridge to Nickell's Mill)
KNG	Greenbrier	North Fork Anthony Creek
KNG	"	Spring Creek
KNG	"	Anthony Creek (Above Big

Draft)		
KNG	Pocahontas	Watoga Lake
KNG	"	Beaver Creek
KNG	"	Knapp's Creek
KNG	"	Hills Creek
KNG	"	North Fork Deer Creek
(Above Route 28/5)		
KNG	"	Deer Creek
KNG	"	Sitlington Creek
KNG	"	Stoney Creek
KNG	"	Swago Creek
KNG	"	Buffalo Fork (Impoundment)
KNG	"	Seneca (Impoundment)
KNG	"	Greenbrier River (Above
Hosterman)		
KNG	"	West Fork-Greenbrier River
(Above the		
		impoundment at the tannery)
KNG	"	Little River-East Fork
KNG	"	Little River-West Fork
KNG	"	Five Mile Run
KNG	"	Mullenax Run
KNG	"	Abes Run
KNB	Mercer	Marsh Fork
KNB	"	Camp Creek
OG	Wyoming	Pinnacle creek
BST	McDowell	Dry Fork (Above Canebrake)

APPENDIX B

This list contains known waters used as public water supplies and is not intended to exclude any waters as described in section 6.2, herein.

River Basin	County	Operating Company	Source
Shenandoah River			
S	Jefferson	Charlestown Water	Shenandoah River
Potomac River			
P	Jefferson	3-M Company	Turkey Run
P	"	Shepherdstown Water	Potomac River
P	"	Harpers Ferry Water	Elk Run
P	Berkeley	DuPont Potomac River Works	Potomac River
P	"	Berkeley County PSD	Le Feure Spring
P	"	Opequon PSD	Quarry Spring
P	"	Hedgesville PSD	Speck Spring
P	Morgan	Paw Paw Water	Potomac River
PSB	Hampshire	Romney Water	South Branch Potomac River
PSB	"	Peterkin Conference Center	Mill Run
PSB	Hardy	Moorefield Municipal Water	South Fork River
PSB	Pendleton	U.S. Naval Radio Sta.	South Fork River
PSB	"	Circleville Water Inc.	North Fork of South Branch, Potomac River
PSB	Grant	Mountain Top PSD	Mill Creek, Impoundment
PSB	"	Petersburg Municipal Water	South Branch, Potomac River
PNB	Grant	Island Creek Coal	Impoundment
PNB	Mineral	Piedmont Municipal Water	Savage River, Maryland
PNB	"	Keyser Water	New Creek
PNB	"	Fort Ashby PSD	Lake
Monongahela River			
M	Monongalia	Morgantown Water Comm.	Colburn Creek & Monongahela River
M	"	Morgantown Ordinance Works	Monongahela River
M	Preston	Preston County PSD	Deckers Creek
M	Monongalia	Blacksville # 1 Mine	Impoundment

M	"	Loveridge Mine	Impoundment
M	"	Consolidation Coal Co.	Impoundment
M	Preston	Mason Town Water	Block Run
MC	Preston	Fibair Inc.	Impoundment
MC	Monongalia	Cheat Neck PSD	Cheat Lake
MC	"	Lakeview County Club	Cheat Lake-Lake Lynn
MC	"	Union District PSD	Cheat Lake-Lake Lynn
MC	"	Cooper's Rock State Park	Impoundment
MC	Preston	Kingwood Water	Cheat River
MC	"	Hopemount State Hosp.	Snowy Creek
MC	"	Rowlesburg Water	Keyser Run & Cheat River
MC	"	Albright	Cheat River
MC	Tucker	Parsons Water	Shavers & Elk Lick Fork
MC	"	Thomas Municipal	Thomas Reservoir
MC	"	Hamrick PSD	Dry Fork
MC	"	Douglas Water System	Long Run
MC	"	Davis Water	Blackwater River
MC	"	Hambleton Water System	Roaring Creek
MC	"	Canaan Valley State Park	Blackwater River
MC	Pocahontas	Cheat Mt. Sewer	Shavers Lake
MC	"	Snowshoe Co. Water	Shavers Fork
MC	Randolph	Womelsdorf Water	Yokum Run
MW	Harrison	Lumberport Water	Jones Run
MW	"	Clarksburg Water Bd.	West Fork River
MW	"	Bridgeport Mun. Water	Deecons & Hinkle Creek
MW	"	Salem Water Board	Dog Run
MW	"	West Milford Water	West Fork River
MW	Lewis	W.V. Water-Weston District	West Fork River
MW	"	Jackson's Mill Camp	Impoundment
MW	"	West Fork River PSD	West Fork River
MW	"	Kennedy Compresssor Station	West Fork River
MW	"	Jane Lew Water Comm.	Hackers Creek
MW	Harrison	Bel-Meadow Country Club	Lake
MW	"	Harrison Power Station	West Fork River
MW	"	Oakdale Portal	Impoundment
MW	"	Robinson Port	Impoundment
MT	Marion	Fairmont Water Comm.	Tygart River
MT	"	Mannington Water	Impoundment
MT	"	Monongah Water Works	Tygart River
MT	"	Eastern Assoc. Coal Corp	Impoundment
MT	"	Four States Water	Impoundment
MT	Harrison	Shinnston Water Dept.	Tygart River

	MT	Taylor	Grafton Water	Tygart River-Lake
	MT	Barbour	Phillippi Water	Tygart River
	MT	"	Bethlehem Mines Corp.	Impoundment
	MT	"	Belington Water Works	Tygart River & Mill Run Lake
	MT	Randolph	Elkins Municipal Water	Tygart River
	MT	"	Beverly Water	Tygart river
	MT	"	Valley Water	Tygart River
	MT	"	Huttonsville Medium Security Prison	Tygart River
	MT	"	Mill Creek Water	Mill Creek
	MTB	Upshur	Buckhannon Water Board	Buckhannon River
Ohio River				
O	Zone 1	Hancock	Chester Water & Sewer	Ohio River
O	"	Brooke	City of Weirton	Ohio River
O	"	"	Weirton Steel Division	Ohio River
O	"	Ohio	Wheeling Water	Ohio River
O	"	Tyler	Sistersville Mun. Water	Ohio River
O	"	Pleasants	Pleasants Power Station	Ohio River
O	"	Cabel	Huntington Water Corp.	Ohio River
O	"	Marshall	Mobay Chemical Co.	Ohio River
O	"	Wood	E. I. DuPont	Ohio River
O	Zone 2	Marshall	Cameron Water	Glass House Hollow
O	"	"	New Urindahana Water	Wheeling Creek System
O	"	Wetzel	Pine Grove Water	North Fork, Fishing Creek
O	"	Marshall	Consolidated Coal Co. Impoundment	
O	"	Tyler	Middlebourne Water	Middle Island Creek
O	"	Doddridge	West Union Mun. Water	Middle Island Creek
O	"	Mason	Hidden Valley Country Lake/Impoundment	
O	"	Jackson	Ripley Water	Mill Creek
O	"	Wayne	Wayne Municipal Water	Twelve Pole Creek
O	"	"	East Lynn Lake	East Lynn Lake
O	Zone 2	Wayne	Monterey Coal Co.	Impoundment
Little Kanawha				
	LK	Wood	Claywood Park PSD	Little Kanawha River
	LK	Calhoun	Grantsville Mun. Water	Little Kanawha River
	LK	Gilmer	Glenville Utility	Little Kanawha

			River
LK	"	Consolidated Gas Compressor	Steer Creek
LK	Braxton	Burnsville Water Works	Little Kanawha River
LK	Roane	Spencer Water	Spring Creek Mile Tree Reservoir
LK	Wirt	Elizabeth Water	Little Kanawha River
LKH	Ritchie	Cairo Water	North Fork Hughes River
LKH	"	Harrisville Water	North Fork Hughes River
LKH	"	Pennsboro Water	North Fork Hughes River

Kanawha River

K	Putnam	Buffalo Water	Cross Creek
K	"	Winfield Water	Poplar Fork & Crooked Creek
K	"	South Putnam PSD	Poplar Fork & Crooked Creek
K	Kanawha	Cedar Grove Water	Kanawha River
K	"	Pratt Water	Kanawha River
K	Fayette	Armstrong PSD PO-K1-CO-EL & Gum Hollow	Kanawha River
K	"	Kanawha Water Co.-	Unnamed Tributary Kanawha Beards Fork River
K	Kanawha	Midland Trail School	Impoundment
K	"	Cedar Coal Co.	Impoundment
K	Fayette	Elkem Metals Co.	Kanawha River
K	"	Deepwater PSD	Kanawha River
K	"	Kanawha Falls PSD	Kanawha River
K	"	W.V. Water-Montgomery	Kanawha River

Pocatalico River

KP	Kanawha	Sissonville PSD	Pocatalico River
KP	Roane	Walton PSD	Silcott Fork Dam

Coal River

KC	Kanawha	St. Albans Water	Coal River
KC	"	Washington PSD	Coal River
KC	Lincoln	Lincoln PSD	Coal River
KC	Boone	Coal River PSD	Coal River
KC	"	Whitesville PSD	Coal River
KC	Raleigh	Armco Mine 10	Marsh Fork
KC	"	Armco Steel-Montc.	Coal River

		Stickney	
KC	Raleigh	Peabody Coal	Coal River
KC	"	Stephens Lake Park	Lake Stephens
KC	Boone	W.V. Water-Madison Dist.	Little Coal River
KC	"	Van PSD	Pond Fork
KC	Raleigh	Consol. Coal Co.	Workmans Creek
KC	Boone	Water Ways Park	Coal River

Elk River

KE	Kanawha	Clendenin Water	Elk River
KE	"	W.V. Water-Kanawha Valley District	Elk River
KE	Kanawha	Pinch PSD	Elk River
KE	Clay	Clay Waterworks	Elk River
KE	"	Procious PSD	Elk River
KE	Braxton	Flatwoods-Canoe Run PSD	Elk River
KE	"	Sugar Creek PSD	Elk River
KE	"	W.V. Water-Gassaway Dist.	Elk River
KE	"	W.V. Water-Sutton Dist.	Elk River
KE	Webster	W.V. Water-Webster Springs	Elk River
KE		Holly River State Park	Holly River

Gauley River

KG	Nicholas	Craigsville PSD	Gauley River
KG	"	Summersville Water	Impoundment/Muddlety Creek
KG	"	Nettie-Leivasy PSD	Jim Branch
KG	Webster	Cowen PSD	Gauley River
KG	Nicholas	Wilderness PSD	Anglins Creek & Meadow River
KG	"	Richwood Water	North Fork Cherry River

New River

KN	Fayette	Ames Heights Water	Mill Creek
KN	"	Mt. Hope Water	Impounded Mine (Surface)
KN	"	Ansted Municipal Water	Mill Creek
KN	"	Fayette Co. Park	Impoundment
KN	"	New River Gorge Campground	Impoundment
KN	"	Fayetteville Water	Wolfe Creek
KN	Raleigh	Beckley Water	Glade Creek
KN	"	Westmoreland Coal Co.	Farley Branch

Bluestone River

KNB	Summers	Jumping Branch-Nimitz	Mt. Valley Lake
KNB	"	Bluestone Conf. Center	Bluestone Lake

KNB	"	Pipestem State Park	Impoundment
KNB	Mercer	Town of Athens	Impoundment
KNB	"	Bluewell PSD	Impoundment
KNB	"	Bramwell Water	Impoundment
KNB	"	Green Valley-Glenwood PSD	Bailey Reservoir
KNB	"	Kelly's Tank	Spring
KNB	"	W.V. Water Princeton	Impoundment/Brusch Creek
KNB	"	Lashmeet PSD	Impoundment
KNB	"	Pinnacle Water Assoc.	Mine
KNB	"	W.V. Water Bluefield	Impoundment

Greenbrier River

KNG	Summers	W.V. Water Hinton	Greenbrier River & New River
KNG	"	Big Bend PSD	Greenbrier River
KNG	Greenbrier	Alderson Water Dept.	Greenbrier River
KNG	"	Ronceverte Water	Greenbrier River
KNG	"	Lewisburg Water	Greenbrier river
KNG	Pocahontas	Denmar State Hospital Water	Greenbrier River
KNG	"	City of Marlinton Water	Knapp Creek
KNG	"	Cass Scenic Railroad	Leatherbark Creek
KNG	"	Upper Greenbrier PSD	Greenbrier River
KNG	"	The Hermitage	Greenbrier

Guyandotte River

OG	Cabell	Salt Rock PSD	Guyandotte River
OG	Lincoln	West Hamlin Water	Guyandotte Rriver
OG	Logan	Logan Water Board	Guyandotte River
OG	"	Man Water Works	Guyandotte River
OG	"	Buffalo Creek PSD	Buffalo Creek/ Mine/Wells
OG	Logan	Chapmanville	Guyandotte River
OG	"	Logan PSD	Whitman Creek/ Guyandotte River
OG	Mingo	Gilbert Water	Guyandotte

			River
OG	Wyoming	Oceana Water	Laurel Fork
OG	"	Glen Rogers PSD	Impoundment
OG	"	Pineville Water	Pinnacle Creek/ Guyandotte River
OG	Raleigh	Raleigh Co. PSD-Amigo	Tommy Creek
OMG	Cabell	Milton Water Works	Guyandotte River
OMG	"	Culloden PSD	Indian Fork Creek
OMG	Putnam	Hurricane Municipal Water	Impoundment
OMG	"	Lake Washington PSD	Lake Washington
Big Sandy River			
BS	Wayne	Kenova Municipal Water	Big Sandy River
BS	"	Fort Gay Water	Tug Fork
BST	Mingo	Kermit Water	Tug Fork
BST	"	Matewan Water	Tug Fork
BST	"	A & H Coal Co., Inc.	Impoundment
BST	"	Williamson Water	Impoundment
BST	McDowell	City of Welch	Impoundment/Wells
BST	"	City of Gary	Impoundment/Mine

APPENDIX C
CATEGORY E-3 - POWER PRODUCTION

This list contains known power production facilities and is not intended to exclude any waters as described in section 6.6.c, herein.

River Basin	County	Station Name	Operating Company
Monongahela River			
M	Monongalia	Fort Martin Power Station	Monongahela Power
M	Marion	Rivesville Station	Monongahela Power
MC	Preston	Albright Station	Monongahela Power
Potomac	Grant	Mt. Storm Power Station	Virginia Electric & Power Company
Ohio River			
O - Zone 1	Wetzel	Hannibal (Hydro)	Ohio Power
O " "	Marshall	Kammer	Ohio Power
O " "	"	Mitchell	Ohio Power
O " "	Pleasants	Pleasants Station	Monongahela Power
O " "	"	Willow Island Station	Monongahela Power
O " "	Mason	Phillip Sporn Plant	Central Operating (AEP)
O " "	"	Racine (Hydro)	Ohio Power
O " "	"	Mountaineer	Appalachian Power Co.
K	Putnam	Winfield (Hydro)	Appalachian Power Co.
K	Kanawha	Marmet (Hydro)	Appalachian Power Co.
K	"	London (Hydro)	Appalachian Power Co.
K	"	Kanawha River	Appalachian Power Co.
K	"	John E. Amos	Appalachian Power Co.

APPENDIX D
CATEGORY C - WATER CONTACT RECREATION

This list contains waters known to be used for water contact recreation and is not intended to exclude any waters as described in section 6.4, herein.

River Basin	Stream Code	Stream	County
Shenandoah	S	Shenandoah River	Jefferson
Potomac	P	Potomac River	Jefferson
	P	" "	Hampshire
	P	" "	Berkeley
	P	" "	Morgan
	P-9	Sleepy Creek & Meadow Branch	Berkeley
	P-9-G-1	North Fork of Indian Run	Morgan
South Branch	PSB	South Branch of Potomac River	Hampshire
	PSB	" "	Hardy
	PSB	" "	Grant
	PSB-21-X	Hawes Run	Pendleton
	PSB-25-C-2	Spring Run	Grant
	PSB-28	North Fork South Branch Potomac River	Grant
North Branch	PNB	North Branch of Potomac River	Mineral
	PNB-4-EE	North Fork Patterson Creek	Grant
	PNB-7-H	Linton Creek	Grant
	PNB-17	Stoney River-Mt. Storm Lake	Grant
	PC	Cacapon River	Hampshire
Monongalia			
Cheat	MC	Cheat Lake/Cheat river	Monongalia/Preston
	MC	Alpine Lake	Preston
	MC-6	Coopers Rock Lake/ Quarry Run	Monongalia
	MC-12	Big Sandy Creek	Preston
	MSC	Shavers Fork	Randolph

	MTN	Middle Fork River	Barbour/ Randolph/ Upshur
	MW	West Fork River	Harrison
	MW-18	Stonecoal Creek/ Stonecoal Lake	Lewis
Ohio	O	OhioRiver	Brooke/ Cabell/ Hancock/ Jackson/ Marshall/ Mason/Ohio/Pleasants/ Tyler/WayneWood/Wetzel
	O-2-H	Beech Fork of Twelvepole Creek/Beech Fork Lake	Wayne
	O-2-Q	East Fork of Twelvepole Creek/East Lynn Lake	Wayne
	O-3	Fourpole Creek	Cabell
	O-21	Old Town Creek/ McClintic Ponds	Mason
	OMI	Middle Island Creek/ Crystal Lake	Doddridge
	OG	Guyandotte River	Cabell
	OG	Guyandotte River/ R. D. Bailey Lake	Wyoming
	OGM	Mud River	Cabell
Little Kanawha	LK	Little Kanawha River/ Burnsville Lake	Braxton
Kanawha	K	Kanawha River	Fayette/ Kanawha/ Mason/ Putnam
	K-1	Unnamed Tributary Krodel Lake	Mason
	KC	Coal River	Kanawha
	KC-45-Q	Stephens Branch/ Lake Stephens	Raleigh
	KE	Elk River	Kanawha/ Clay/ Braxton/ Webster/ Randolph

KE	Sutton lake	Braxton
KN	New River	Fayette/ Raleigh/ Summers
KN-26-F	Little Beaver Creek	Raleigh
KNG	Greenbrier River	Greenbrier/Pocahontas/Summers
KNG-23-E-1	Little Devil Creek/ Moncove Lake	Monroe
KNG-28	Anthony Creek	Greenbrier
KNG-28-P	Meadow Creek/ Lake Sherwood	Greenbrier
KNB	Bluestone River/ Bluestone Lake	Summers
KG	Gauley River	Webster
KG	Gauley River/ Summersville Lake	Nicholas
KGW	Williams River	Webster

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.1 Dissolved Aluminum (ug/l) Not to exceed:	750xCF[5]	87xCF[5]	750xCF[5]	87xCF[5]			
8.2 Ammonia (ug/l): Un-ionized ammonia (UA) shall be determined from values of total ammonia-N, pH and temperature according to the following equation: $UA = \frac{1.2(\text{total ammonia-N})}{1+10^{(pka-pH)}}$ where pka = 0.0902 + 2730/(273.2 + T) and T = temperature (°C) The concentration of un-ionized ammonia (NH3) shall not exceed 50 ug/l.						50	

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.2.1 Acute and chronic aquatic life criteria for ammonia shall be determined using the National Criterion for Ammonia in Fresh Water[d] from USEPA's 1999 Update of Ambient Water Quality Criteria for Ammonia (EPA-822-R-99-014, December 1999)	X	X	X	X			
8.3 Antimony (ug/l) Not to exceed:					4300	14	
8.4 Arsenic[b] (ug/l) Not to exceed:					50	50	100
8.4.1 Dissolved Trivalent Arsenic Not to exceed:	360 x CF[5]	190 x CF[5]	360 x CF[5]	190 x CF[5]			
8.5 Barium (mg/l) Not to exceed:						1.0	
8.6 Beryllium (ug/l)	130		130			.0077	

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.7 Cadmium (ug/l) Hardness (mg/l $CaCO_3$) Soluble Cd 0 - 35 1.0 36 - 75 2.0 76 - 150 5.0 > 150 10.0						X	
8.7.1 Not to exceed 10 ug/l in the Ohio River (O Zone 1) main stem (see section 7.1.d, herein)						X	
8.7.3 The four-day average concentration of dissolved cadmium shall not exceed the value determined by the following equation: $Cd = e^{(0.7852[\ln(hardness)]-3.490)} \times CF$[5]		X		X			
8.7.4 The one-hour average concentration of dissolved cadmium shall not exceed the value determined by the following equation: $Cd = e^{(1.128[\ln(hardness)]-3.828)} \times CF$[5]	X		X				

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.8 Chloride (mg/l) Not to exceed:	860	230	860	230	250	250	
8.9.1 Chromium, dissolved hexavalent (ug/l): Not to exceed:	16 x CF[5]	11 x CF[5]	16 x CF[5]	7.2 x CF[5]		50	
8.9.2 Chromium, trivalent (ug/l) The one-hour average concentration of dissolved trivalent chromium shall not exceed the value determined by the following equation: exp{0.8190[ln(hardness)]+3.7256} x (CF[5])	X		X				
8.9.3 The four-day average concentration of dissolved trivalent chromium shall not exceed the value determined by the following concentration: exp{0.8190[ln(hardness)]+0.6848}x (CF[5]).		X		X			
8.10 Copper (ug/l) Not to exceed:						1000	
8.10.1 The four-day average concentration of dissolved copper shall not exceed the value determined by the following equation[a]: $Cu = e^{(0.8545[\ln(hardness)]-1.465)} \times CF^5$		X		X			

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.10.2 The one-hour average concentration of dissolved copper shall not exceed the value determined by the following equation[a]: $Cu = e^{(0.9422[\ln(\text{hardness})]-1.464)} \times CF$[5]	X		X				
8.11 Cyanide (ug/l) (As free cyanide $HCN+CN^-$) Not to exceed:	22	5.0	22	5.0	5.0	5.0	
8.12 Dissolved Oxygen[c]: not less than 5 mg/l at any time.	X				X	X	X
8.12.1 Kanawha River main stem, Zone 1 - Not less than 4.0 mg/l at any time.	X						
8.12.2 Ohio River main stem - the average concentration shall not be less than 5.0 mg/l per calendar day and shall not be less than 4.0 mg/l at any time or place outside any established mixing zone - provided that a minimum of 5.0 mg/l at any time is maintained during the April 15-June 15 spawning season.	X						

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.12.3 Not less than 7.0 mg/l in spawning areas and in no case less than 6.0 mg/l at any time.			X				
8.13 Fecal Coliform: Maximum allowable level of fecal coliform content for Primary Contact Recreation (either MPN or MF) shall not exceed 200/100 ml as a monthly geometric mean based on not less than 5 samples per month; nor to exceed 400/100 ml in more than ten percent of all samples taken during the month.					X	X	
8.13.1 Ohio River main stem (zone 1) - During the non-recreational season (November through April only) the maximum allowable level of fecal coliform for the Ohio River (either MPN or MF) shall not exceed 2000/100 ml as a monthly geometric mean based on not less than 5 samples per month.					X		

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.14 Fluoride (mg/l) Not to exceed:						1.4	
8.14.1 Not to exceed 2.0 for category D uses.							X
8.15 Iron[c] (mg/l) Not to exceed:		1.5		0.5		1.5	
8.16 Lead (ug/l) Not to exceed:						50	
8.16.1 The four-day average concentration of dissolved lead shall not exceed the value determined by the following equation[a]: $Pb = e^{(1.273[\ln(\text{hardness})]-4.705)} \times CF^5$		X		X			
8.16.2 The one-hour average concentration of dissolved lead shall not exceed the value determined by the following equation[a]: $Pb = e^{(1.273[\ln(\text{hardness})]-1.46)} \times CF^5$	X		X				

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.17 Manganese (mg/l) (see §6.2.d) Not to exceed:						1.0	
8.18 Mercury The total organism body burden of any aquatic species shall not exceed 0.5 ug/g as methylmercury.					0.5	0.5	
8.18.1 Total mercury in any unfiltered water sample shall not exceed (ug/l):	2.4		2.4		0.15	0.14	
8.18.2 Methylmercury (water column) Not to exceed (ug/l):		.012		.012			
8.19 Nickel (ug/l) Not to exceed:					4600	510	
8.19.1 The four-day average concentration of dissolved nickel shall not exceed the value determined by the following equation[a]: $Ni = e^{(0.846[\ln(\text{hardness})]+1.1645)} \times CF^{5}$		X		X			

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.19.2 The one-hour average concentration of dissolved nickel shall not exceed the value determined by the following equation[a]: $Ni = e^{(0.846[\ln(\text{hardness})]+3.361)} \times CF$[5]	X		X				
8.20 Nitrate (as Nitrate-N) (mg/l)						10	
8.21 Nitrite (as Nitrite-N) (mg/l) Not to exceed:	1.0		.060				
8.22 Organics							
Chlordane[b] (ng/l)	2400	4.3	2400	4.3	0.46	0.46	0.46
DDT[b] (ng/l)	1100	1.0	1100	1.0	0.024	0.024	0.024
Aldrin[b] (ng/l)	3.0		3.0		0.071	0.071	0.071
Dieldrin[b] (ng/l)	2500	1.9	2500	1.9	0.071	0.071	0.071
Endrin (ng/l)	180	2.3	180	2.3	2.3	2.3	2.3
Toxaphene[b] (ng/l)	730	0.2	730	0.2	0.73	0.73	0.73

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
PCB[b] (ng/l)		14.0		14.0	0.045	0.044	0.045
Methoxychlor (ug/l)		0.03		0.03	0.03	0.03	0.03
Dioxin (2,3,7,8- TCDD)[b] (pg/l)					0.014	0.013	0.014
Acrylonitrile[b] (ug/l)					0.66	0.059	
Benzene[b] (ug/l)					71	0.66	
1,2-dichlorobenzene (mg/l)					17	2.7	
1,3-dichlorobenzene (mg/l)					2.6	0.4	
1,4-dichlorobenzene (mg/l)					2.6	0.4	
2,4-dinitrotoluene[b] (ug/l)					9.1	0.11	
Hexachlorobenzene[b] (ng/l)					0.77	0.72	
Carbon tetrachloride[b] (ug/l)					4.4	0.25	
Chloroform[b] (ug/l)					470	~~0.19~~ 5.7	
Halomethanes (ug/l)					15.7	0.19	
1,2-dichloroethane[b] (ug/l)					99	0.035	

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
1,1,1- trichloroethane[b] (mg/l)						12	
1,1,2,2-tetrachloroethane (ug/l)					11	0.17	
1,1-dichloroethylene[b] (ug/l)					3.2	0.03	
Trichloroethylene[b] (ug/l)					81	2.7	
Tetrachloroethylene[b] (ug/l)					8.85	0.8	
Toluene[b] (mg/l)					200	6.8	
Polynuclear Aromatic Hydrocarbons (PAH)[b] (ug/l)					0.031	.0028	
Phthalate esters (ug/l)		3.0		3.0			
Vinyl chloride[b] (chloroethene)(ug/l)					525	2.0	
alpa-BHC (alpha- Hexachloro-cyclohexane)[b] (ug/l)					0.013	.0039	
beta-BHC(beta- Hexachloro-cyclohexane)[b] (ug/l)					0.046	0.014	
gamma-BHC (gamma- Hexachloro-cyclohexane)[b] (ug/l)	2.0	0.08	2.0	0.08	0.063	0.019	

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
Chlorobenzene (mg/l)					21	0.68	
Ethylbenzene (mg/l)					29	3.1	
Heptachlor[b] (ng/l)	520	3.8	520	3.8	0.21	0.21	
2-methyl-4,6-Dinitrophenol (ug/l)					765	13.4	
Fluoranthene (ug/l)					370	300	
8.22.1 The organic chemicals listed in §8.22 shall not exceed the specified water quality criteria. When the specified criteria are less than the practical laboratory quantification level, instream values will be calculated from discharge concentrations and flow rates, where applicable.							
8.23 pH[c] No values below 6.0 nor above 9.0. Higher values due to photosynthetic activity may be tolerated.	X	X	X	X	X	X	X

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.24 Phenolic Materials							
8.24.1 Phenol (ug/l) Not to exceed:					4,600,000	21,000	
8.24.2 2-Chlorophenol (ug/l) Not to exceed:					400	120	
8.24.3 2,4-Dichlorophenol (ug/l) Not to exceed:					790	93	
8.24.4 2,4-Dimethylphenol (ug/l) Not to exceed:					2300	540	
8.24.5 2,4-Dinitrophenol (ug/l) Not to exceed:					14,000	70	
8.24.6 Pentachlorophenol[b] (ug/l)					8.2	0.28	
8.24.6.a The one-hour average concentration of pentachlorophenol shall not exceed the value determined by the following equation: exp(1.005(pH)-4.869)	X		X				
8.24.6.b The 4-day average concentration of pentachlorophenol shall not exceed the value determined by the following equation: exp(1.005(pH)-5.134).		X		X			

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.24.7 2,4,6-Trichlorophenol[b] (ug/l) Not to exceed:					6.5	2.1	
8.25 Radioactivity: Gross Beta activity not to exceed 1000 picocuries per liter (pCi/l), nor shall activity from dissolved strontium-90 exceed 10 pCi/l, nor shall activity from dissolved alpha emitters exceed 3 pCi/l.	X		X		X	X	X
8.25.1 Gross total alpha particle activity (including radium-226 but excluding radon and uranium shall not exceed 15 pCi/l and combined radium-226 and radium-228 shall not exceed 5pCi/l; provided that the specific determination of radium-226 and radium-228 are not required if dissolved particle activity does not exceed 5pCi/l; the concentration of tritium shall not exceed 20,000 pCi/l; the concentration of total strontium-90 shall not exceed 8 pCi/l in the Ohio River main stem.	X		X		X	X	X

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.26 Selenium (ug/l) Not to exceed:	20	5	20	5		10	
8.27 Silver (ug/l) Hardness Silver 0-50 1 51-100 4 101-200 12 >201 24				X		X	
8.27.1 0-50 1 51-100 4 101-200 12 201-400 24 401-500 30 501-600 43		X					
8.27.2 The one-hour average concentration of dissolved silver shall not exceed the value determined by the following equation: $Ag=e^{(1.72[\ln(hardness)]-6.52)} \times CF$[5]	X		X				

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.28 Temperature Temperature rise shall be limited to no more than 5°F above natural temperature, not to exceed 87°F at any time during months of May through November and not to exceed 73°F at any time during the months of December through April. During any month of the year, heat should not be added to a stream in excess of the amount that will raise the temperature of the water more than 5°F above natural temperature. In lakes and reservoirs, the temperature of the epilimnion should not be raised more than 3°F by the addition of heat of artificial origin. The normal daily and seasonable temperature fluctuations that existed before the addition of heat due to other natural causes should be maintained.	X						

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.28.1 For the Kanawha River Main Stem (K-1): Temperature rise shall be limited to no more than 5°F above natural temperature, not to exceed 90°F in any case.	X						
8.28.2 For the Bluestone R (KNB), Bluestone Lake (KN-60) East River (KNE), New River (KN), Gauley R. (KG) and Greenbrier River (KNG): Temperature rise shall be limited to no more than 5°F above natural temperature, not to exceed 81°F at any time during the months of May through November and not to exceed 73°F at any time during December through April.			X				

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.28.3 No heated effluents will be discharged in the vicinity of spawning areas. The maximum temperatures for cold waters are expressed in the following table: Daily Mean °F / Hourly Max °F Oct-Apr 50 / 55 Sep-May 58 / 62 Jun-Aug 66 / 70			X				

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.28.4 For Ohio River Main Stem (01) (see section 7.1.d, herein): Dates — Period Ave. — Inst. Max. Jan 1-31 45°F 50°F February 45 50 March 1-15 51 56 March 16-31 54 59 April 1-15 58 64 April 16-30 64 69 May 1-15 68 73 May 16-31 75 80 June 1-15 80 85 June 16-30 83 87 July 1-31 84 89 August 1-31 84 89 Sept 1-15 84 87 Sept 16-30 82 86 Oct 1-15 77 82 Oct 16-31 72 77 Nov 1-30 67 72 Dec 1-31 52 57	X						

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.29 Thallium (ug/l)					6.3	1.7	
8.30 Threshold odor[c] Not to exceed a threshold odor number of 8 at 104°F as a daily average.		X		X	X	X	
8.31 Total Residual Chlorine (ug/l - measured by amperometric or equivalent method) Not to exceed:	19	11					
8.31.1 No chlorinated discharge allowed			X				
8.32 Turbidity No point or non-point source to West Virginia's waters shall contribute a net load of suspended matter such that the turbidity exceeds 10 NTU's over background turbidity when the background is 50 NTU or less, or have more than a 10% increase in turbidity (plus 10 NTU minimum) when the background turbidity is more than 50 NTUs.							

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
This limitation shall apply to all earth disturbance activities and shall be determined by measuring stream quality directly above and below the area where drainage from such activity enters the affected stream. Any earth disturbing activity continuously or intermittently carried on by the same or associated persons on the same stream or tributary segment shall be allowed a single net loading increase.		X		X	X	X	
8.32.1 This rule shall not apply to those activities at which Best Management Practices in accordance with the State's adopted 208 Water Quality Management Plan are being utilized, maintained and completed on a site-specific basis as determined by the appropriate 208 cooperative or an approved Federal or State Surface Mining Permit is in effect. This exemption shall not apply to Trout Waters.		X			X	X	

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.33 Zinc (ug/l) The four-day average concentration of dissolved zinc shall not exceed the value determined by the following equation[a]: $Zn = e^{(0.8473[\ln(hardness)]+0.7614)} \times CF$[5]		X		X			
8.33.1 The one-hour average concentration of dissolved zinc shall not exceed the value determined by the following equation[a]: $Zn = e^{(0.8473[\ln(hardness)]+0.8604)} \times CF$[5]	X		X				

1 One hour average concentration not to be exceeded more than once every three years on the average, unless otherwise noted.

2 Four-day average concentration not to be exceeded more than once every three years on the average, unless otherwise noted.

3 These criteria have been calculated to protect human health from toxic effects through fish consumption, unless otherwise noted.

4 These criteria have been calculated to protect human health from toxic effects through drinking water and fish consumption, unless otherwise noted.

5 The appropriate Conversion Factor (CF) is a value used as a multiplier to derive the dissolved aquatic life criterion is found in Appendix E, Table 2.

a Hardness as calcium carbonate (mg/l). The minimum hardness allowed for use is this equation shall not be less than 25 mg/l, even if the actual ambient hardness is less than 25 mg/l. The maximum hardness value for use in this equation shall not exceed 400 mg.l even if the actual hardness is greater than 400 mg/l.

b Known or suspected carcinogen. Human health standards are for a risk level of 10^{-6}.

c May not be applicable to wetlands (B4) - site-specific criteria are desirable.

d The early life stage equation in the National Criterion shall be used to establish chronic criteria throughout the state unless the applicant demonstrates that no early life stages of fish occur in the affected water(s).

APPENDIX E
TABLE 2

Conversion Factors

Metal	Acute	Chronic
Aluminum	1.000	1.000
Arsenic (III)	1.000	1.000
Cadmium	1.136672-[(ln hardness)(0.041838)]	1.101672-[(ln hardness)(0.041838)]
Chromium (III)	0.316	0.860
Chromium(VI)	0.982	0.962
Copper	0.960	0.960
Lead	1.46203-[(ln hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]
Nickel	0.998	0.997
Silver	0.85	N/A
Zinc	0.978	0.986

APPENDIX F
ANTIDEGRADATION IMPLEMENTATION PROCEDURES

46-1-4A. Applicability.

4A.1. Except as noted, the antidegradation implementation procedures herein apply to regulated activities that have the potential to affect water quality. The level of review required will depend upon the existing uses of the water segment that would be affected, the level of protection ("tier") assigned to the applicable water segment, the nature of the activity, and the extent to which existing water quality would be degraded.

4A.2. Nonpoint source activities will be deemed to be in compliance with antidegradation requirements with the installation and maintenance of cost-effective and reasonable best management practices in accordance with 46 CSR 1-4.1.b. herein. These include, but are not limited to, best management practice programs for silviculture administered by the Division of Forestry, programs for oil and gas operations administered by the Office of Oil and Gas of the Division of Environmental Protection, nonpoint source construction activities, and reasonable land, soil and water conservation measures and practices applied to agricultural nonpoint sources.

4A.3. Where applicable and practical, the antidegradation procedure and review shall be integrated into and proceed concurrently with existing environmental processes and reviews pursuant to the National Environmental Policy Act.

4A.4. Information contained within existing environmental processes and reviews, such as environmental assessments, environmental impact statements, facilities plans, and findings of no significant impact, may be used to provide part or all of the requirements of the antidegradation procedure and review.

46-1-4B. Definitions.

4B.1. For purposes of this Subpart (Appendix F) the term "agency" or "agencies" refers to the Division of Environmental Protection or other federal, state, or local governmental entities with regulatory authority over activities that may affect water quality.

4B.2. For purposes of this Subpart (Appendix F) the term

"regulated entity" refers generally to any regulated entity that affects or is proposing an activity that will affect water quality. For example, an applicant for a WV/NPDES permit, a WV/NPDES permit holder, or an owner or operator of an activity that discharges pollutants into a water of the state would be a regulated entity.

4B.3. For purposes of this Subpart (Appendix F) the term "minimum uses" refers to recreation and wildlife and the propagation and maintenance of fish and other aquatic life.

46-1-4C. Antidegradation Review Process.

4C.1. As set forth in 46 CSR 1-4.1, the State's antidegradation policy requires that existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. This requirement applies to all waters of the state.

4C.2. Except where a water segment is specifically listed as a Tier 2.5 or Tier 3 water, the following section outlines how the agency conducting the antidegradation review will determine the level of protection ("tier") assigned to the receiving water body associated with the activity subject to this rule.

4C.3. Uses. The Director, in conducting an antidegradation review, must determine the existing uses of the receiving water body associated with the proposed activity. The Director shall determine the existing uses of the water body by identifying the uses set forth in 46 CSR 1 Section 6 that the water body currently supports, or has supported since November 28, 1975. The regulated entity may be required to provide data sufficient for the permitting agency to determine the existing uses of the water segment.

4C.4. Baseline water quality. Where baseline water quality has not been established for the water segment the regulated entity proposes to impact or has not been established for a parameter of concern that is reasonably expected to be discharged into the water segment as a result of the proposed regulated activity, the Director must determine the baseline water quality for the receiving water body. The Director may consider data for establishing the baseline water quality from a federal or state agency, the regulated entity, the public, or any other source, as long as

the data are recent and reliable. If adequate data are not available, the agency may, in conjunction with the regulated entity or on its own initiative, establish a plan for obtaining the necessary data. The regulated entity may be required to provide baseline water quality for those parameters of concern that are reasonably expected to be discharged as a result of the regulated activity into the affected water segment to help the permitting agency determine the baseline water quality, the existing uses, and the applicable tier. The regulated entity may contact the Director prior to initiating a baseline water quality evaluation to seek concurrence with its determination of the parameters of concern for its proposed activity and its proposed sampling protocol.

4C.5. Determination of tier. If the tier has not already been determined for the water segment the regulated entity proposes to impact, then after determining the baseline water quality for parameters of concern and the existing uses for a water body, the agency will determine which level of protection (i.e. "tier") applies to the receiving water body associated with the activity.

4C.5.a. Water segments listed in Appendix F-2 of this rule shall receive Tier 2.5 protection.

4C.5.b. Water segments within a federally designated Wilderness Area, as well as other water segments specifically listed in this rule as an outstanding national resource water shall receive Tier 3 protection.

4C.5.c. Water segments not within a federally designated Wilderness Area and not listed in Appendix F-2 of this rule shall receive Tier 1 protection, and shall receive Tier 2 protection if the water segment is determined, pursuant to 4E.1.a. through 4E.1.c. of this rule, to be a high quality water for purposes of antidegradation review.

4C.5.d. Water segments may be determined to receive only Tier 1 protection, pursuant to 4D.2. through 4D.6. of this rule, for purposes of antidegradation review.

4C.5.e. To the extent practicable, a list of water segments protected under Tier 2.5 or Tier 3 will be maintained on the West Virginia Division of Environmental Protection's website.

4C.6. Level of review. Once the correct level of protection ("tier") and water segment use(s) are identified for the receiving water body, the agency shall document its findings and proceed with the appropriate level of antidegradation review.

4C.7. On or after the effective date of these implementation procedures, new and reissued WV/NPDES general permits will be evaluated to consider the potential for significant degradation as a result of the permitted activity. Regulated activities that are granted coverage by a WV/NPDES general permit will not be required to undergo a Tier 2 antidegradation review as part of the permit registration process. Regulated activities that are granted coverage by a WV/NPDES permit that will degrade a Tier 2.5 or Tier 3 water segment must comply with the requirements of 4F and 4G herein.

4C.8. Regulated activities that qualify for coverage under a Corps of Engineers regional or nationwide permit pursuant to section 404 of the Federal Act that has been certified by the state pursuant to section 401 of the Federal Act will not be required to undergo a Tier 2 antidegradation review, provided, however, that where an individual 401 certification is required, the Director may require an appropriate antidegradation review. Where an activity covered by a regional or nationwide permit pursuant to section 404 of the Federal Act and certified pursuant to section 401 of the Federal Act allows for filling of a water, this exemption only applies to the site of the fill, and does not apply to activities downstream of the site of the fill. Regulated activities that are granted section 401 certification that will degrade a Tier 2.5 or Tier 3 water segment must comply with the requirements of 4F and 4G herein.

4C.9. The Director shall develop guidance which addresses these implementation procedures and provides additional information to persons conducting regulated activities that are affected by these procedures. Such guidance shall include, but shall not be limited to, information regarding the following: (a) the determination of baseline water quality; (b) social and economic importance pursuant to section 4E.4; and (c) the reasonable alternatives analysis required by section 4E.3. The Director shall provide an opportunity for public review and comment before finalizing any guidance. Within twelve months of the effective date of this rule, the Director shall report to the advisory committee

established pursuant to W.Va. Code §22-1-9 regarding the status of its implementation.

46-1-4D. Tier 1 Protection.

4D.1. Existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

4D.2. Tier 1 protection applies to all waters of the state. A water segment shall be afforded Tier 1 protection where the level of water quality is not sufficient to support recreation and wildlife and the propagation and maintenance of fish and other aquatic life, or where the water quality meets but does not exceed levels necessary to support recreation and wildlife and the propagation and maintenance of fish and other aquatic life.

4D.3. In determining whether a water segment is afforded only Tier 1 protection, the agency will focus on whether the water segment is meeting or failing to meet minimum uses, except that, notwithstanding any other provision of this rule, the main stems of the Monongahela River, and the Kanawha River from milepoint 72 to the confluence with the Ohio River shall be afforded Tier 1 protection only.

4D.4. The Director will consider whether a water segment is listed on the state's 303(d) impaired waters list, but where the parameter(s) for which the water segment is listed does not result in that water segment's failure to attain minimum uses and where all other parameters exceed the quality necessary to support recreation and wildlife and the propagation and maintenance of fish and other aquatic life, the water segment will be afforded Tier 2 protection. Where the parameter(s) for which the water segment is listed does result in failure to attain minimum uses, such as an acid mine drainage-impacted water segment, that water segment will be afforded only Tier 1 protection.

4D.5. All water segments listed on the state's 303(d) impaired waters list will be afforded only Tier 1 protection for the parameter(s) that resulted in the water segment being listed.

4D.6. There also may be waters in the state where one or both of the fishable/swimmable uses are attained, but existing

water quality is not "better than necessary" to support those uses (i.e., assimilative capacity does not exist for any of the parameters that would be affected by the proposed activity). Tier 1 protection is appropriate for such a water segment.

4D.7. Where existing uses of the water body are impaired, there shall be no lowering of the water quality with respect to the parameters of concern that are causing the impairment. The agency shall consider nomination of such water body for the 303(d) list of water quality-impaired streams.

4D.8. Where a proposed activity will result in a new or expanded discharge that would otherwise prevent attainment of an existing use in a water subject to Tier 1 protection, the applicant may be allowed to satisfy antidegradation review requirements by implementing or financing upstream controls of point or nonpoint sources sufficient to offset the water quality effects of the proposed activity from the same parameters and insure an improvement in water quality as a result of the trade. The basis of the trade will be documented and will be consistent with the trading assessment procedure that has been approved by the Director. A trade may be made between more than one stream segment where removing a discharge in one stream segment directly results in improved water quality in another stream segment. In addition, (1) the effluent trade must be for the same parameter; (2) where uncertainty exists regarding the effluent trade, an adequate margin of safety will be required; (3) dischargers cannot claim offsets for water quality improvements that are required or will occur irrespective of the proposed new or expanded discharge; and (4) the trade must be enforceable.

46-1-4E. Tier 2 Protection (High Quality Waters).

4E.1. Tier 2 protection.

4E.1.a. A water segment shall be considered a Tier 2 high quality water where the level of water quality exceeds levels necessary to support recreation and wildlife and the propagation and maintenance of fish and other aquatic life.

4E.1.b. Tier 2 waters need not exceed the level of quality needed to meet or exceed numeric criteria for every parameter. Water segments that support the minimum fishable/swimmable uses and have assimilative capacity

remaining for some parameters shall generally be afforded Tier 2 protection. For example, a water segment listed on the state's 303(d) impaired waters list can qualify for Tier 2 protection, but where the impairment that caused the water segment to be listed results in failure to attain minimum uses, that water segment will be afforded only Tier 1 protection.

4E.1.c. Where a water segment does not meet or exceed applicable water quality criteria for every parameter, the Director will determine whether the water segment will be afforded Tier 2 protection as part of the antidegradation review process using best professional judgment. In addition to data available for review, the Director may consider factors such as (1) existing aquatic life uses, (2) existing recreational or aesthetic uses, (3) existing water quality data for upstream segments or comparable segments, (4) biological score for the water segment, and (5) the overall value of the segment from an ecological, health and public use perspective.

4E.1.d. Where insufficient information is available to determine which tier should apply, a regulated entity may seek a determination that a water segment should be afforded only Tier 1 protection by submitting water quality data consistent with guidance developed pursuant to subdivision 4C.9. of this rule showing that there is no remaining assimilative capacity for any parameter to be affected by its activity. In seeking such a determination, the impacts of all of the regulated entity's activities on the water segment must be considered.

4E.1.e. Where there is insufficient information to establish which tier should apply, it is the intent of these procedures to apply Tier 2 protection to such waters until such time as sufficient water quality data is obtained to determine the appropriate level of protection. No presumption shall be made with regard to the actual quality of any waters as a result of such initial application.

4E.2. Tier 2 antidegradation review.

4E.2.a. Any regulated activity in a Tier 2 water segment is required to go through the Tier 2 antidegradation review process where:

4E.2.a.1. The regulated activity is a new or expanded

activity that would significantly degrade water quality; or

4E.2.a.2. the Director determines, upon renewal of a permit or certification, that other individual circumstances warrant a full review such as cumulative degradation resulting from multiple discharges within a watershed, degradation resulting from a single discharge over time, or degradation caused by a regulated facility's historic noncompliance with its permit.

4E.2.b. In allowing any degradation, the agency shall assure water quality adequate to protect existing uses fully (i.e., Tier 1 protection).

4E.2.c. The Director may determine that certain types or classes of activities should be exempt from Tier 2 review after balancing the relative impact of the activities on water quality against the overall benefit of the activities to public health and welfare or the environment. The Director's discretion to exempt activities from review pursuant to this section shall be exercised and construed narrowly. Such types or classes of activities may include, for example, expansions or improvements to publicly owned wastewater treatment facilities or activities, public benefit activities by governmental entities, or discharges related to environmental remediation activities. Where the agency tentatively determines to grant an exemption under this provision, notice of this determination must be included in any required public notice, such as public notice required prior to issuance of an NPDES permit. The Director's final determination is a final decision and subject to appeal to the Environmental Quality Board.

4E.2.c.1. A proposed new or expanded discharge from a publicly owned or publicly owned and privately operated sanitary wastewater treatment plant constructed or operated to alleviate a public health concern associated with failing septic systems or untreated or inadequately treated sewage, is exempt from Tier 2 review. This exemption would include combined sewer overflow elimination or reduction projects affecting one or more water bodies and applies only where there will be a net decrease in the overall pollutant loading discharged to the combined receiving waters.

4E.2.d. Degradation for Tier 2 shall be deemed significant if the activity results in a reduction in the

water segment's available assimilative capacity (the difference between the baseline water quality and the water quality criteria) of ten percent or more at the appropriate critical flow condition(s) for parameters of concern. Critical flow conditions for non-precipitation induced discharges are the 7Q10 flow of the receiving stream, plus either of the following: maximum permitted flow or maximum flow specified in the application, for industrial activities, or the average design flow, for wastewater treatment activities. Degradation will also be deemed significant if the proposed activity, together with all other activities allowed after the baseline water quality is established, results in a reduction in the water segment's available assimilative capacity of 20% or more at the appropriate critical flow conditions for the parameters of concern.

4E.2.e. Significant degradation will be determined on a parameter-by-parameter basis for each parameter of concern that might be affected by the regulated activity.

4E.2.f. A proposed activity that will result in a new or expanded discharge in a water subject to Tier 2 protection may be allowed where the applicant agrees to implement or finance upstream controls of point or nonpoint sources sufficient to offset the water quality effects of the proposed activity from the same parameters and insure an improvement in water quality as a result of the trade. The basis of the trade will be documented and will be consistent with the trading assessment procedure that has been approved by the Director. A trade may be made between more than one stream segment where removing a discharge in one stream segment directly results in improved water quality in another stream segment. In addition, (1) the effluent trade must be for the same parameter; (2) where uncertainty exists regarding the effluent trade, an adequate margin of safety will be required; (3) dischargers cannot claim offsets for water quality improvements that are required or will occur irrespective of the proposed new or expanded discharge; and (4) the trades must be enforceable.

4E.2.g. New or expanded activities determined to be significant by the agency shall be subject to the Tier 2 review requirements described in sections 4E.2. through 4E.5. herein. If the agency determines that no further Tier 2 review requirements shall apply for an activity, the activity must still achieve the highest established statutory and regulatory requirements applicable to them, or conditions of

the permit, or water quality certification, and that determination must be made a part of the public notification, as provided in 4H.3.

4E.3. Review of alternatives.

4E.3.a. If a determination is made that significant degradation will occur, the agency shall determine whether reasonable and cost effective less-degrading or non-degrading alternatives to the proposed activity exist. The agency will evaluate any alternatives analysis submitted by the regulated activity for consistency with the requirements set forth in Subsection 4E.3.b. herein.

4E.3.b. A regulated entity proposing any new or expanded regulated activity that would significantly degrade water quality in a high quality water is required to prepare an evaluation of alternatives to the proposed activity. The evaluation must provide substantive information pertaining to the cost and environmental impacts associated with the following alternatives:

4E.3.b.1. Pollution prevention measures;

4E.3.b.2. Reduction in scale of project;

4E.3.b.3. Water recycle or reuse;

4E.3.b.4. Process changes;

4E.3.b.5. Innovative treatment technology or technologies;

4E.3.b.6. Advanced treatment technology or technologies;

4E.3.b.7. Seasonal or controlled discharge options to avoid critical water quality periods;

4E.3.b.8. Improved operation and maintenance of existing treatment systems; and

4E.3.b.9. Alternative discharge locations.

4E.3.c. After alternatives to allowing degradation have been adequately evaluated, a determination shall be made regarding whether cost-effective and reasonable non-degrading

or less-degrading alternatives to the proposed activity shall be required. This determination will be based primarily on the alternatives analysis developed by the regulated entity, but may be supplemented with other information and data. As a rule of thumb, cost effective and reasonable non-degrading or less-degrading pollution control alternatives with costs that are less than 110% of the costs of the pollution control measures associated with the proposed activity shall be considered reasonable.

4E.3.d. If it is determined that reasonable and cost effective less degrading or non-degrading alternatives to the proposed activity do exist, the project design may be revised accordingly. In general, if reasonable alternative(s) exist, the alternative or combination of alternatives that provide the least amount of degradation shall be implemented up to the determined reasonable and cost-effective threshold. If the regulated entity does not agree to adopt such reasonable and cost-effective alternatives, the alternatives analysis findings will be documented and the activity will not be allowed.

4E.4. Review of social and economic importance.

4E.4.a. If significant degradation would occur, even after application of reasonable less-degrading or non-degrading alternatives, a determination shall be made as to whether the proposed activity is necessary to accommodate important economic or social development in the area in which the waters are located.

4E.4.b. The regulated activity must document the social and economic importance of the proposed activity.

4E.4.c. The factors to be addressed in such documentation may include, but are not limited to, the following:

4E.4.c.1. Employment (e.g., increasing, maintaining or avoiding a reduction in employment);

4E.4.c.2. Increased production;

4E.4.c.3. Improved community tax base;

4E.4.c.4. Housing;

4E.4.c.5. Ancillary community economic benefit; and

4E.4.c.6. Correction of an environmental or public health problem.

4E.4.d. In addition to the above, a regulated entity may be required to submit the following:

4E.4.d.1. Information pertaining to current aquatic life, recreational, or other water uses;

4E.4.d.2. Information necessary to determine the environmental impacts that may result from the proposed activity;

4E.4.d.3. Facts pertaining to the current state of economic development in the area (e.g., population, area employment, area income, major employers, types of businesses);

4E.4.d.4. Government fiscal base; and

4E.4.d.5. Land use in the areas surrounding the proposed activity.

4E.4.e. Once the available information pertaining to the socio-economic importance of the proposed activity has been reviewed by the agency, a preliminary determination regarding importance shall be made. In evaluating the regulated activity's demonstration of socio-economic importance, the agency may use EPA's Interim Economic Guidance for Water Quality Standards Workbook (EPA 823-B-95-002, March, 1995). Where there is a request for a variance from groundwater standards pursuant to 47 CSR 57 for existing sites where activities on those sites have the potential to impact surface water from contaminated groundwater and the activity is otherwise subject to this rule, the socio-economic justification process required under 47 CSR 57 subdivision 6.2.i will satisfy the requirements of this section. If the proposed activity is determined to have social or economic importance in the area in which the affected waters are located, the substance and basis for that preliminary determination shall be documented and the Tier 2 review shall continue.

4E.5. Intergovernmental coordination for Tier 2 reviews.

4E.5.a. The intergovernmental coordination requirements in 46 CSR 1 Section 4.1.b. will be accomplished by providing notice to those agencies listed in Appendix F-1 that the Director believes may have regulatory oversight of the regulated activity of the preliminary determination of the socio-economic review and requesting comments from those agencies regarding that review.

4E.5.b. The public notice of the proposed activity will be provided as set forth in section 4H.3. herein.

4E.5.c. Once the intergovernmental coordination and public notice requirements are satisfied, the Director shall make a final determination concerning the social or economic importance of the proposed activity. All social and economic importance determinations, including determinations to prohibit the activity, shall be documented and made a part of the public record.

46-1-4F. Tier 2.5 Protection Review Procedures (Waters of Special Concern).

See section 46-1-4.1.c and 46-1-2.29 for a description of waters of special concern.

4F.1. Tier 2.5 waters.

4F.1.a. Any proposed activity that would degrade a water segment listed in Appendix F-2 of this rule as waters of special concern will go through the Tier 2.5 antidegradation review process. Discharges from publicly-owned or publicly-owned and privately operated sanitary wastewater treatment plants that expand to alleviate a public health concern associated with failing septic systems or untreated or inadequately treated sewage, shall be permissible in a Tier 2.5 water segment where there will be a net decrease in the overall pollutant loading discharged to the combined receiving waters: *Provided*, That less degrading alternative treatment technologies are considered and used where costs for such technologies are within budgets and rates approved for such expansion project. This provision may extend to combined sewer overflow elimination or reduction projects. Except as provided in 4F.1.b. of this rule, the listing procedure for Tier 2.5 waters is set forth in section 4H.1. herein. Currently listed Tier 2.5 waters are included in Appendix F-2 to this rule.

4F.1.b. Initial Presumptive Listing for Tier 2.5.

4F.1.b.1. The stream or stream segments that appear on Appendix F-3 shall be presumed to qualify as Tier 2.5 waters. Before any such stream or stream segment is protected as Tier 2.5 waters (and listed on Appendix F-2) the Director shall do the following:

(a) Assure compliance with all provisions of article one-a of chapter twenty-two; and

(b) No sooner than six months and no later than twelve months from the effective date of this rule, provide, where practicable, individual notice to property owners along such stream or stream segment. In addition, notice by publication shall be provided to all property owners and others with a legal interest in the property. The notice shall include at a minimum, the information set forth in paragraphs 4H.1.a.1.a. through 4H.1.a.1.d. of this rule. The notice shall indicate that a property owner or holder of legal interest in the property shall have thirty days to file an objection to the inclusion of the stream or stream segment as a Tier 2.5 water.

4F.1.b.2. Should an objection be received from an owner or holder of a legal interest in property adjoining any stream on Appendix F-3, the Director shall provide written justification for the inclusion of the stream as a Tier 2.5 stream with reference to the criteria set out in 4H.1.a.2. of this rule. The Director shall then provide a thirty-day comment period on the proposed action.

4F.1.b.3. Where no objection is made to the inclusion of a stream or stream segment as a Tier 2.5 water, the stream shall be included by the Director on Appendix F-2 without further justification.

4F.1.b.4. Any final decision by the Director with regard to the inclusion of a stream in Tier 2.5 made following the procedure set forth in this paragraph, may be appealed to the EQB.

4F.1.c. Following the initial listing for Tier 2.5 waters, as described in paragraph 4F.1.b. above, subsequent additions or deletions from Appendix F-2 shall be in accordance with section 4H.1., herein.

4F.2. Tier 2.5 antidegradation review.

4F.2.a. No significant degradation of Tier 2.5 waters will be allowed. For Tier 2.5 waters, degradation will be deemed significant if it exceeds the baseline water quality plus ten percent of available assimilative capacity (the difference between the baseline water quality and the water quality criteria), whether from a single activity or cumulatively, except that discharges affecting dissolved oxygen, pH, fecal coliform or temperature will be deemed insignificant provided that:

4F.2.a.1. For dissolved oxygen, the maximum DO sag will not be greater than 0.4 ppm based on an appropriate wasteload allocation model, unless that reduction is projected to cause a violation of sections 8.12 through 8.12.3 in Appendix E, Table 1 herein;

4F.2.a.2. pH is maintained within the 6.0 to 9.0 range;

4F.2.a.3. Thermal discharges will be consistent with 316(a) of the Federal Act or will not increase the temperature more than two degrees Fahrenheit at any time or cause other violations of applicable criteria in sections 8.28 through 8.28.4 in Appendix E, Table 1, herein.

4F.2.a.4. For fecal coliform, necessary and appropriate treatment (disinfection) or control is required and the fecal coliform concentrations are established as 200/100 ml monthly average and 400/100 ml daily maximum.

4F.2.b. Where a Tier 2.5 water has one or more parameters that fail to meet water quality criteria, the Director shall use best professional judgment in setting appropriate limitations for such parameters, with the goal of improving baseline water quality for such parameters over time.

4F.2.c. Where baseline water quality has not been established for the Tier 2.5 water segment for a parameter of concern that is reasonably expected to be discharged into the water segment as a result of a new or expanded regulated activity, a determination of the baseline water quality for the receiving water segment must be established for that parameter of concern prior to allowing any new or expanded discharge.

4F.2.d. The Director may consider data for establishing the baseline water quality from a federal or state agency, the regulated entity, the public, or any other source, as long as the data are recent and reliable. The regulated entity may be required to provide baseline water quality for those parameters of concern that are reasonably expected to be discharged as a result of the regulated activity into the affected water segment.

4F.2.e. After the baseline water quality has been established for the parameters of concern reasonably expected to be discharged by the proposed activity, the *de facto* criteria for those parameters of concern will equal the established baseline water quality plus ten percent of available assimilative capacity.

4F.2.f. Regulated entities with discharges existing on or before the effective date of this rule that discharge into a Tier 2.5 water may be required to submit an alternatives analysis upon renewal of its application or upon the written request of the Director to evaluate reasonable and cost-effective alternatives that would reduce the activity's impact to a Tier 2.5 water.

4F.2.g. Discharges from activities in waters upstream of a water of special concern shall not result in the ambient water quality within the Tier 2.5 water exceeding the *de facto* criteria.

4F.2.h. A proposed activity that will result in a new or expanded discharge in a water subject to Tier 2.5 protection may be allowed where the applicant agrees to implement or finance upstream controls of point or nonpoint sources sufficient to offset the water quality effects of the proposed activity from the same parameters and insure an improvement in water quality as a result of the trade. The basis of the trade will be documented and will be consistent with the trading assessment procedure that has been approved by the Director. A trade may be made between more than one stream segment where removing a discharge in one stream segment directly results in improved water quality in another stream segment. In addition, (1) the effluent trade must be for the same parameter; (2) where uncertainty exists regarding the effluent trade, an adequate margin of safety will be required; (3) dischargers cannot claim offsets for water quality improvements that are required or will occur irrespective of

the proposed new or expanded discharge; and (4) the trades must be enforceable.

4F.2.i. If a determination is made that the activity will result in significant degradation of a Tier 2.5 water, the activity shall not be allowed.

4F.2.j. If the activity is determined not to result in significant degradation of a Tier 2.5 water, the activity may be allowed. In such case the antidegradation review findings will be documented in writing and public notice activities will be initiated consistent with section 4H.3. herein.

4F.2.k. Short-term water quality impacts. The Director shall determine whether a proposed activity is short term in nature and the resulting changes in water quality will be temporary and have limited effects. Notwithstanding sections 4F.2.a. and 4F.2.e. herein, short-term activities which result in less than a 10% change in the available assimilative capacity may be deemed to have limited effects. Determinations will be made on a case-by-case basis and shall be made after consideration of the following factors:

4F.2.k.1. The length of time during which the water quality will be lowered;

4F.2.k.2. The percent change in ambient concentrations;

4F.2.k.3. The parameters affected;

4F.2.k.4. The likelihood for long-term water quality benefits to the segment (e.g., as may result from dredging of contaminated sediments);

4F.2.k.5. The degree to which achieving applicable water quality standards during the proposed activity may be at risk;

4F.2.k.6. The potential for any residual long-term influences on existing uses; and

4F.2.k.7. The cumulative impacts from all sources for the parameters affected.

46-1-4G. Tier 3 Protection Review Procedures (Outstanding National Resource Waters). See subdivisions 46-1-4.1.d and 46-1-2.15 for a description of Outstanding National Resource Waters (ONRW).

4G.1. Tier 3 waters. ONRWs are to be maintained, protected and improved where necessary. Any proposed new or expanded regulated activity that would degrade (result in a lowering of water quality) a water body that has been approved as an ONRW, other than temporary lowering of water quality, is prohibited.

4G.2. Tier 3 antidegradation review. The agency shall use the following antidegradation implementation procedures for evaluating new or expanded regulated activities that have the potential to affect Outstanding National Resource Waters (ONRWs), as described in subdivision 46-1-4.1.c. and as nominated and approved in accordance with the provisions of Appendix F.

4G.2.a. Determine whether the proposed activity is short term in nature and the resulting changes in water quality will be temporary. Such determination will be made on a case-by-case basis and shall be made after consideration of the following factors:

4G.2.a.1. The length of time during which the water quality will be lowered;

4G.2.a.2. The percent change in ambient concentrations;

4G.2.a.3. The parameters affected;

4G.2.a.4. The likelihood for long-term water quality benefits to the segment (e.g., as may result from dredging of contaminated sediments);

4G.2.a.5. The degree to which achieving applicable water quality standards during the proposed activity may be at risk; and

4G.2.a.6. The potential for any residual long-term influences on existing uses.

4G.2.b. If after review of the factors in 4G.2.a.1-6, the agency determines that the proposed activity will be short term in nature and the changes in water quality will be temporary and limited, the proposed activity may be authorized. In such case the antidegradation review findings shall be documented and public notice activities shall be initiated. If after review of the factors in 4G.2.a.1 through 4G.2.a.6. the agency determines that the proposed activity will not be short term in nature or that changes in water quality will not be temporary and limited, the proposed activity shall be denied.

4G.3. Sources upstream from an ONRW. Any proposed activity that would result in a permanent new or expanded discharge upstream of an ONRW segment is prohibited except where such source would improve or not degrade the existing water quality of the downstream ONRW segment.

4G.3.a. To determine whether the proposed activity will result in the lowering of water quality in the downstream ONRW segment, the following factors, when applicable, shall be considered:

4G.3.a.1. Change in ambient concentrations predicted at the appropriate critical condition(s);

4G.3.a.2. Change in loadings (i.e., the new or expanded loadings compared to total existing loadings to the segment);

4G.3.a.3. Reduction in available assimilative capacity;

4G.3.a.4. Nature, persistence and potential effects of the parameter;

4G.3.a.5. Potential for cumulative effects;

4G.3.a.6. Degree of confidence in the various components of any modeling technique utilized (e.g., degree of confidence associated with the predicted effluent variability); and

4G.3.a.7. Other factors determined by the Director, when appropriate.

4G.3.b. If a preliminary determination is made that the applicable criteria in 4G.3.a.1. through 4G.3.a.7. will be met, the antidegradation review findings shall be documented and the applicable public notice activities shall be initiated. If after review of the factors in 4G.3.a.1. through 4G.3.a.7., the Director determines that the proposed activity will result in the lowering of water quality in the downstream ONRW stream segment, the proposed activity shall be denied.

4G.4. For ONRWs in areas designated as federal Wilderness, nothing in this rule is intended to authorize activities not authorized by the Wilderness Act.

4G.5. A proposed activity that will result in a new or expanded discharge in a water subject to Tier 3 protection may be allowed where the applicant agrees to implement or finance upstream controls of point or nonpoint sources sufficient to

offset the water quality effects of the proposed activity from the same parameters and insure an improvement in water quality as a result of the trade. The basis of the trade will be documented and will be consistent with the trading assessment procedure that has been approved by the Director. A trade may be made between more than one stream segment where removing a discharge in one stream segment directly results in improved water quality in another stream segment. In addition, (1) the effluent trade must be for the same parameter; (2) where uncertainty exists regarding the effluent trade, an adequate margin of safety will be required; (3) dischargers cannot claim offsets for water quality improvements that are required or will occur irrespective of the proposed new or expanded discharge; and (4) the trade must be enforceable.

46-1-4H. Designation of Tier 2.5 and Tier 3 waters; public participation in antidegradation reviews; appeals.

4H.1. Listing process for Tier 2.5 waters.

4H.1.a. Tier 2.5 Nomination Procedures. Any interested party or the Board may nominate a water to be listed as a Water of Special Concern. After reviewing the nomination the Board shall consider the qualification criteria and may designate the nominated water as a Tier 2.5 water in accordance with the notice and comment provisions of 46 CSR 6, Procedural Rules Governing Site Specific Revisions to Water Quality Standards. The address for filing such petitions is West Virginia Environmental Quality Board, 1615 Washington Street, East, Room 301, Charleston, West Virginia 25311-2126. The nominating party has the burden of establishing a basis for listing of a water segment as a Tier 2.5 water. The Board shall return insufficient nominations to the nominating party. Generally, nominations that fail to address at least three of the qualification criteria shall be considered insufficient.

4H.1.a.1. Upon receiving a sufficient nomination of a water or segment of a water for designation as a Tier 2.5 water pursuant to the Board's antidegradation policy, the Board shall, within 180 days of receipt of the nomination, notify each locality in which the water or segment lies and shall provide individual notice to property owners on the nominated segment. Where individual notice to property owners is impracticable, constructive notice by publication shall be provided. The written notice shall include, at a minimum:

4H.1.a.1.a. A description of the location of the waters or segment;

4H.1.a.1.b. The procedures and criteria for designation as well as the impact of the designation;

4H.1.a.1.c. The name of the person(s) making the nomination; and

4H.1.a.1.d. The name of a contact person at the Environmental Quality Board who is knowledgeable about the nomination of the waters or segment. After receipt of the notice of the nomination, landowners, the public and localities shall be provided 60 days to comment.

4H.1.a.2. Qualification Criteria. Factors to be considered in determining whether to assign a Water of Special Concern designation to a water from another category shall include the following:

4H.1.a.2.a. Impact on private property owners;

4H.1.a.2.b. Whether the interests of all affected parties have been adequately represented during the nomination and designation process;

4H.1.a.2.c. The location of the water;

4H.1.a.2.d. Any previous special designations;

4H.1.a.2.e. Existing water quality;

4H.1.a.2.f. Factors that indicate unique or exceptional ecological, recreational or aesthetic resource value;

4H.1.a.2.g. Impact on economic development in the area, including development of demonstrated natural resources; and

4H.1.a.2.h. Other factors determined by the Board, when applicable.

4H.1.a.3. Reclassification of a Water of Special Concern. The Board may on its own, or at the request of an interested party, consider reclassifying a Water of Special Concern to another antidegradation tier. In considering a reclassification, the Board shall review the criteria outlined in subparagraphs 4H.1.a.2.a. through 4H.1.a.2.h. above. After such consideration, the Board may reclassify a Tier 2.5 water in accordance with the notice and comment provisions of 46 CSR 6, Procedural Rules Governing Site Specific Revisions to Water Quality Standards.

4H.2. Listing process for Tier 3 waters.

4H.2.a. Tier 3 Nomination Procedures. Any interested party or the Board may nominate a water as an ONRW. After reviewing the nomination the Board shall consider the qualification criteria and may classify the nominated water as a Tier 3 water in accordance with the notice and comment provisions of 46 CSR 6, Procedural Rules Governing Site Specific Revisions to Water Quality Standards. The address for filing such petitions is West Virginia Environmental Quality Board, 1615 Washington Street, East, Room 301, Charleston, West Virginia 25311-2126. The nominating party has the burden of establishing a basis for listing of a water segment as a Tier 3 water. The Board shall return insufficient nominations to the nominating party. Generally, nominations that fail to address at least three of the qualification criteria set out in paragraph 4H.2.a.2. of this rule shall be considered insufficient.

4H.2.a.1. Upon receiving a sufficient nomination of a water or segment of a water for designation as a Tier 3 water pursuant to the Board's antidegradation policy, the Board shall notify each locality in which the water or segment lies and shall provide individual notice to property owners on the nominated segment. Where individual notice to property owners is impracticable, constructive notice by publication shall be provided. The written notice shall include, at a minimum:

4H.2.a.1.a. A description of the location of the waters or segment;

4H.2.a.1.b. The procedures and criteria for designation as well as the impact of the designation;

4H.2.a.1.c. The name of the person(s) making the nomination; and

4H.2.a.1.d. The name of a contact person at the Environmental Quality Board who is knowledgeable about the nomination of the waters or segment. After receipt of the notice of the nomination, landowners, the public and localities shall be provided 60 days to comment.

4H.2.a.2. Qualification Criteria. Factors to be considered in determining whether to assign an ONRW designation to a water from another category shall include the following:

4H.2.a.2.a. Impact on private property owners;

4H.2.a.2.b. Whether the interests of all affected parties have been adequately represented during the nomination and designation process;

4H.2.a.2.c. The location of the water;

4H.2.a.2.d. Any previous special designations;

4H.2.a.2.e. Existing water quality;

4H.2.a.2.f. Outstanding ecological value;

4H.2.a.2.g. Outstanding recreational or aesthetic value; and

4H.2.a.2.h. Other factors determined by the Board, when applicable.

4H.3. Public participation in antidegradation reviews.

4H.3.a. All antidegradation review findings shall be documented by the Director and made part of the public record. The findings, including the baseline water quality, the existing uses, and the tier assigned to the water body are to be available to the public.

4H.3.b. Any required public notice will be provided through the appropriate Class I or Class II legal advertisement in a qualified newspaper with the largest circulation for the county where the activity will occur. The notice will identify the action being considered, list all existing uses identified of the water, and call for comments from the public regarding the proposed activity. The cost of such publication will be borne by the applicant.

4H.3.c. Public notice, opportunity for public comment, and opportunity for a public hearing, consistent with the requirements of 47 CSR 10 section 12, will be provided of all activities proposed to be allowed after a Tier 1, 2, 2.5, or 3 antidegradation review. Such public notice may be combined with other required notifications, such as notification to agencies as part of required intergovernmental coordination or notification of a proposed permit decision.

4H.3.d. Public notice is not required to be provided for proposed activities on Tier 1 or Tier 2 waters for which a review process has not been required, such as activities covered by a WV/NPDES general permit, except that any trading approved by the Director for antidegradation purposes will

require public notice consistent with the requirements of 47 CSR 10-12.

4H.3.e. Public notice of Tier 2 antidegradation reviews. After a full Tier 2 review has been completed for a proposed activity, the public notice shall include notice of the availability of the following:

4H.3.e.1. The decision as to whether the proposed activity has been determined to comply with the antidegradation implementation rule;

4H.3.e.2. Findings from the alternatives analysis;

4H.3.e.3. A determination of the impact of the activity to ambient concentrations and baseline water quality;

4H.3.e.4. The results of the socio-economic evaluation of the activity;

4H.3.e.5. The determination regarding existence of reasonable and cost effective non-degrading or less degrading alternatives; and

4H.3.e.6. A description of the water segment that is subject to the antidegradation review.

4H.3.f. Once the intergovernmental coordination and public notice requirements of Subpart 4H.3. are satisfied, the Director shall make a determination concerning the social or economic importance in the area in which the affected water bodies are located. All determinations, including determinations to prohibit the activity, shall be documented and made a part of the public record.

4H.4. Appeals.

4H.4.a. Final agency decisions, made after public comment, that identify applicable uses, designate tiers, or that find regulated activities to be allowed or prohibited, are final actions that are appealable as set forth in the Administrative Procedures Act. Final agency actions made by the Director are appealable to the Board.

APPENDIX F-1
ANTIDEGRADATION IMPLEMENTATION PROCEDURES
INTERGOVERNMENTAL COORDINATION AGENCIES

STATE AGENCIES

Bureau of Commerce
- Division of Natural Resources
- Division of Forestry
- Development Office

Department of Health and Human Resources
- Bureau for Public Health

Bureau of the Environment
- Division of Environmental Protection - all offices

Department of Agriculture
- Soil Conservation Agency

Department of Transportation
- Division of Highways

FEDERAL AGENCIES
- US Environmental Protection Agency, Region III
- US Fish and Wildlife Service
- US Army Corps of Engineers
- US Forest Service
- US Office of Surface Mining

APPENDIX F-2
WV DNR and WV DEP - Waters of Special Concern

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APPENDIX F-3

Initial Presumptive Listing for Tier 2.5

DNR CODE	STREAM NAME	LENGTH (miles)	LENGTH (miles)
Tug Fork Watershed			
BST-60-D	CUB BRANCH	0.72	0.72
BST-60-E	GEORGE BRANCH	3.79	3.79
BST-60-F	CRANE CREEK	1.22	1.22
BST-60-G	HURRICANE BRANCH	2.99	2.99
BST-60-H-2	WHITE OAK BRANCH	1.78	1.78
BST-70-N	LITTLE SLATE CREEK	3.42	3.42
BST-70-U-1	BIG BRANCH	1.86	1.86
BST-70-W	JACOBS FORK	10.50	10.50
BST-70-Z	VALL CREEK	2.31	2.31
BST-76-E	DAYCAMP BRANCH	1.67	1.67
BST-99	ELKHORN CREEK	8.41	8.41
		38.68	
James River Watershed			
J-1-A	EWIN RUN	2.64	2.64
J-1-C	NORTH FORK	5.88	5.88
J-2	SWEET SPRINGS CREEK	6.10	6.10
J-3	COVE CREEK	6.66	6.66
		21.27	
Kanawha River Watershed (Upper & Lower)			
K-13	LITTLE SIXTEENMILE CREEK	4.45	4.45
K-14-B-1	UNT OF FIVEFORK BRANCH	1.87	1.87
K-39-E-3	BAYS BRANCH	1.89	1.89
K-39-M-1	HOFFMAN HOLLOW	2.32	2.32
K-39-O	SHREWSBURY HOLLOW	1.54	1.54
K-76	LOOP CREEK	19.98	19.98
		32.06	
Coal River Watershed			
KC-10-22	WHITE OAK BRANCH	2.08	2.08
KC-31-B	HOPKINS FORK	8.95	8.95
		11.03	
Elk River Watershed			
KE	ELK RIVER	5.00	5.00
KE-102-A	CAMP CREEK	14.19	14.19
KE-111-K	SUGAR CREEK	10.51	10.51
KE-111-K-2	LITTLE SUGAR CREEK	7.61	7.61
KE-117-B	RIGHT FORK	13.60	13.60
KE-118	BERGOO CREEK	8.19	8.19
KE-127	BIG RUN	2.53	2.53
KE-129	VALLEY FORK	2.68	2.68
KE-133	DRY FORK	3.80	3.80
KE-135	BIG RUN	1.94	1.94
KE-136	PROPS RUN	1.38	1.38

KE-137 LAUREL RUN	2.63	2.63
KE-138 BIG SPRING FORK	9.67	9.67
KE-138-B CUP RUN	2.02	2.02
KE-139-5A SLATY FORK	4.79	4.79
KE-139-B CROOKED FORK	2.51	2.51
KE-14-P PANTHER HOLLOW	1.55	1.55
KE-50-B-10 IKE FORK	1.88	1.88
KE-50-I ROCKCAMP RUN	6.66	6.66
KE-76-L-5 TUG FORK	3.83	3.83
KE-76-O POPLAR CREEK	6.29	6.29
KE-76-U JOHNSON BRANCH	2.44	2.44
KE-98-B-16 DESERT FORK	4.97	4.97
KE-98-C LEFT FORK	5.73	5.73
KE-98-C-1 LAURELPATCH RUN	1.51	1.51
KE-98-C-11 LAUREL FORK	5.59	5.59
KE-98-C-14 FALL RUN	6.06	6.06
KE-98-C-15 BIG RUN	3.79	3.79
KE-98-C-1-A LONG FORK	2.56	2.56
	145.90	
Gauley River Watershed		
KG GAULEY RIVER	26.56	26.56
KG-19-A DOGWOOD CREEK	5.08	5.08
KG-19-G ANGLINS CREEK	12.77	12.77
KG-19-J BRACKENS CREEK	6.55	6.55
KG-19-U-1 BROWN CREEK	3.19	3.19
KG-19-U-2-C OLD FIELD BRANCH	2.88	2.88
KG-19-U-2-D JOB KNOB BRANCH	3.85	3.85
KG-19-V-5 LAUREL CREEK	3.61	3.61
KG-19-V-7 KUHN BRANCH	1.91	1.91
KG-20 COLLISON CREEK	4.98	4.98
KG-24 HOMINY CREEK	23.40	23.40
KG-24-E GRASSY CREEK	5.68	5.68
KG-24-E-2 BRUSHY MEADOW CREEK	5.23	5.23
KG-24-J PRICE FORK	2.83	2.83
KG-26-K BRUSHY FORK	5.53	5.53
KG-32-J CRANES NEST RUN	2.26	2.26
KG-34-B COAL SIDING RUN	1.50	1.50
KG-34-E LAUREL CREEK	9.18	9.18
KG-34-E-11 MIDDLE BRANCH	3.34	3.34
KG-34-E-13 COLD SPRING BRANCH	1.71	1.71
KG-34-E-3 SPRING RUN	1.52	1.52
KG-34-E-8 BEECH RUN	3.08	3.08
KG-34-E-9 HOGCAMP RUN	2.55	2.55
KG-34-F LITTLE LAUREL CREEK	9.87	9.87
KG-34-F-2 IMPROVEMENT BRANCH	1.86	1.86
KG-34-G SOUTH FORK	7.21	7.21
KG-34-G-10 COLD KNOB FORK	5.60	5.60
KG-34-G-13 BIG RUN	1.44	1.44
KG-34-G-5 ELKLICK RUN	2.10	2.10

KG-34-G-6 ROCKY RUN	3.54	3.54
KG-34-G-8 BECKY RUN	2.56	2.56
KG-34-H NORTH FORK	16.37	16.37
KG-34-H-14 BEAR RUN	2.21	2.21
KG-34-H-4 HUNTERS RUN	3.09	3.09
KG-34-H-5 COATS RUN	1.08	1.08
KG-34-H-9 ARMSTRONG RUN	1.24	1.24
KG-45 BIG LAUREL CREEK	6.56	6.56
KG-57 MILLER MILL RUN	4.37	4.37
KG-58 LAUREL CREEK	2.07	2.07
KG-59 BIG RUN	1.32	1.32
KG-5-F-3 BEARPEN FORK	1.27	1.27
KG-5-H ASH FORK	3.09	3.09
KG-5-J NEIL BRANCH	2.65	2.65
KG-6 RICH CREEK	6.74	6.74
KG-60 TURKEY CREEK	4.86	4.86
KG-61 HUGHES RUN	2.79	2.79
KG-65 WILLIAMS CAMP RUN	1.66	1.66
KG-67 STRAIGHT CREEK	1.83	1.83
KG-70 BIG RUN	3.22	3.22
KG-72 MIDDLE FORK	1.96	1.96
KG-73 NORTH FORK	3.29	3.29
KGC CRANBERRY RIVER	38.39	38.39
KGC-14 LICK BRANCH	1.22	1.22
KGC-15 HANGING ROCK BRANCH	1.24	1.24
KGC-19 DOGWAY FORK	8.75	8.75
KGC-21 BIRCHLONG RUN	2.18	2.18
KGC-23-E CHARLES CREEK	2.59	2.59
KGC-24-C LEFT FORK	1.52	1.52
KGC-3 JAKEMAN RUN	2.06	2.06
KGC-4 BARRENSHE RUN	4.59	4.59
KGC-7 BEE RUN	1.57	1.57
KGC-8 FOXTREE RUN	1.56	1.56
KGC-9 ALDRICH BRANCH	1.25	1.25
KGW WILLIAMS RIVER	34.70	34.70
KGW-1 CRAIG RUN	2.00	2.00
KGW-19 UPPER BANNOCK SHOALS RUN	1.83	1.83
KGW-2 JONATHAN RUN	1.38	1.38
KGW-20 TEA CREEK	5.96	5.96
KGW-20-A LICK CREEK	1.82	1.82
KGW-21 SUGAR CREEK	3.63	3.63
KGW-22 LITTLE LAUREL CREEK	2.47	2.47
KGW-25 DAY RUN	3.08	3.08
KGW-26 BLACK MOUNTAIN RUN	1.65	1.65
KGW-27 MOUNTAIN LICK RUN	2.11	2.11
KGW-3 SAWYER RUN	1.33	1.33
KGW-4 SPICE RUN	1.81	1.81
KGW-8 WHITE OAK FORK	2.14	2.14
KGW-9 LICK BRANCH	1.43	1.43

		379.30	
New River Watershed (Upper & Lower)			
KN-17	MANNS CREEK	3.37	3.37
KN-18	EPHRAIM CREEK	4.22	4.22
KN-23	BUFFALO CREEK	2.41	2.41
KN-24	SLATER CREEK	5.08	5.08
KN-26	PINEY CREEK	16.91	16.91
KN-26-B	FAT CREEK	6.56	6.56
KN-27	LAUREL CREEK	12.37	12.37
KN-27-C	CHESTNUT KNOB FORK	3.54	3.54
KN-29	GLADE CREEK	5.76	5.76
KN-29-E	PINCH CREEK	5.71	5.71
KN-32	MEADOW CREEK	2.59	2.59
KN-37	FALL BRANCH	1.93	1.93
KN-51-O	TURKEY CREEK	9.19	9.19
KN-61	RICH CREEK	2.85	2.85
KNB-12-B	LAUREL CREEK	4.86	4.86
KNB-13	CAMP CREEK	9.29	9.29
KNB-13-D	MASH FORK	2.91	2.91
KNB-13-G	SENG BRANCH	1.48	1.48
KNB-3	LITTLE BLUESTONE RIVER	4.73	4.73
KNB-30	CRANE CREEK	5.40	5.40
		111.16	
Greenbrier River Watershed			
KNG	GREENBRIER RIVER	25.30	25.30
KNG(S)-1	MILLIGAN CREEK	5.71	5.71
KNG(S)-2-B	FLYNN CREEK	4.27	4.27
KNG(S)-3-A	BURNS RUN	4.08	4.08
KNG-23	SECOND CREEK	6.06	6.06
KNG-28	ANTHONY CREEK	15.70	15.70
KNG-28-D	LITTLE CREEK	8.08	8.08
KNG-28-P-1	LAUREL RUN	4.20	4.20
KNG-28-Q-2	TWOMILE RUN	1.55	1.55
KNG-47	BEAVER CREEK	8.18	8.18
KNG-49	SWAGO CREEK	3.77	3.77
KNG-53-G	BARCLAY RUN	1.71	1.71
KNG-53-H	DOUTHAT CREEK	9.02	9.02
KNG-60	LAUREL RUN	3.00	3.00
KNG-66-D	SHOCK RUN	4.46	4.46
KNG-66-H-2	LEFT PRONG	3.29	3.29
KNG-68	DEER CREEK	8.75	8.75
KNG-68-A	NORTH FORK	10.73	10.73
KNG-68-A-3	SUTTON RUN	1.60	1.60
KNG-68-A-4	TACKER FORK	2.46	2.46
KNG-68-A-5	BLACK RUN	2.43	2.43
KNG-68-A-6	ELLEBER RUN	3.08	3.08
KNG-68-A-6-A	GRIFFIN RUN	1.69	1.69
KNG-70	LEATHERBARK RUN	4.69	4.69
KNG-74	TROUT RUN	1.14	1.14

KNG-75	ALLEGHENY RUN	5.33	5.33
KNG-77	ELK CREEK	2.56	2.56
KNG-78	EAST FORK	19.87	19.87
KNG-78-A	JOHNS RUN	2.21	2.21
KNG-78-C	LITTLE RIVER	6.28	6.28
KNG-78-G	FIVEMILE HOLLOW	2.29	2.29
KNG-78-H	POCA RUN	2.73	2.73
KNG-78-H-1	LONG RUN	2.85	2.85
KNG-78-K	MULLENAX RUN	2.92	2.92
KNG-78-L	ABES RUN	2.65	2.65
KNG-79	WEST FORK	17.68	17.68
KNG-79-B	FILL RUN	1.91	1.91
KNG-79-C	LITTLE RIVER	7.59	7.59
KNG-79-C-1	SPAN OAK RUN	2.32	2.32
KNG-79-C-2	CLUBHOUSE RUN	11.02	11.02
KNG-79-C-3	HINKLE RUN	10.41	10.41
		245.59	
Little Kanawha River Watershed			
LK-111	LAUREL RUN	6.04	6.04
LK-131	GETOUT RUN	3.01	3.01
LK-86-E-4	PINE RUN	1.57	1.57
LK-95-L	CARPENTER FORK	5.04	5.04
		15.66	
Cheat River Watershed			
MC-12-A	LAUREL RUN	6.13	6.13
MC-12-B-3	HOG RUN	4.42	4.42
MC-12-B-6	MILL RUN	3.95	3.95
MC-18	ROARING CREEK	8.03	8.03
MC-1-A	RYAN HOLLOW	2.33	2.33
MC-20	ELSEY RUN	3.40	3.40
MC-2-A	DARNELL RUN	2.08	2.08
MC-33-A	FLAG RUN	5.51	5.51
MC-36	WOLF CREEK	6.90	6.90
MC-41	LONG RUN	1.22	1.22
MC-45	TOBES RUN	1.16	1.16
MC-46-B	RIGHT FORK	3.80	3.80
MC-47	JOHNATHAN RUN	1.86	1.86
MC-50	UPPER JOHNATHAN RUN	2.53	2.53
MC-51	CLOVER RUN	1.34	1.34
MC-51-	LEFT FORK	9.16	9.16
MC-51-A	RIGHT FORK	5.45	5.45
MC-51-B	INDIAN FORK	4.16	4.16
MC-52	MINEAR RUN	6.63	6.63
MC-52-0.7	BRIDGE RUN	1.12	1.12
MC-52-A	ROARING RUN	2.12	2.12
MC-53	DRY RUN	2.73	2.73
MC-54	HORSESHOE RUN	15.55	15.55
MC-54-A	MIKE RUN	3.86	3.86
MC-54-C	MAXWELL RUN	2.92	2.92

MC-54-D	HYLE RUN	3.92	3.92
MC-54-E	LICK DRAIN	1.79	1.79
MC-54-F	LAUREL RUN	2.87	2.87
MC-54-G	LYNN RUN	1.33	1.33
MC-54-H	THUNDERSTRUCK RUN	3.89	3.89
MC-54-I	LEADMINE RUN	4.81	4.81
MC-54-I-1	LIME HOLLOW RUN	1.14	1.14
MC-54-J	WOLF RUN	1.80	1.80
MC-54-K	TWELVEMILE RUN	2.25	2.25
MC-55	DRY RUN	3.19	3.19
MC-56	MILL RUN	4.77	4.77
MC-57	WOLF RUN	1.90	1.90
MC-60	DRY FORK	3.76	3.76
MC-60-A	ROARING RUN	0.77	0.77
MC-60-C	ELKLICK RUN	4.52	4.52
MC-60-C-3	JOHN B. HOLLOW	1.12	1.12
MC-60-D-10	SAND RUN	3.19	3.19
MC-60-D-11	YOAKUM RUN	2.48	2.48
MC-60-D-LOWER	BLACKWATER RIVER	2.62	2.62
MC-60-G	RED RUN	5.56	5.56
MC-60-I	MILL RUN	2.92	2.92
MC-60-J	ELKLICK RUN	2.59	2.59
MC-60-K	GLADY FORK	31.31	31.31
MC-60-K-1	THREE SPRING RUN	1.25	1.25
MC-60-K-11	MCCRAY CREEK	2.41	2.41
MC-60-K-15	DANIELS CREEK	3.18	3.18
MC-60-K-16	WEST FORK GLADY FORK	6.13	6.13
MC-60-K-16	WEST FORK GLADY FORK	4.27	4.27
MC-60-K-17	EAST FORK GLADY FORK	7.28	7.28
MC-60-K-17-A	LOUK RUN	1.19	1.19
MC-60-K-2	PANTHER CAMP RUN	1.73	1.73
MC-60-K-2-A	HOG RUN	1.17	1.17
MC-60-K-4	FIVE LICK CREEK	1.71	1.71
MC-60-K-5	WOODFORD RUN	1.14	1.14
MC-60-K-6	BAKER CAMP RUN	1.19	1.19
MC-60-L	BIG RUN	3.69	3.69
MC-60-N	LAUREL FORK	21.52	21.52
MC-60-N-4	BEAVERDAM RUN	2.12	2.12
MC-60-N-8	FIVE LICK RUN	2.45	2.45
MC-60-O	RED CREEK	6.77	6.77
MC-60-O-1	BIG RUN	3.47	3.47
MC-60-O-2	FLATROCK RUN	2.89	2.89
MC-60-O-3	GANDY RUN	2.26	2.26
MC-60-P	SPRUCE RUN	3.25	3.25
MC-60-Q	HORSECAMP RUN	4.59	4.59
MC-60-R	TORY CAMP RUN	2.43	2.43
MC-60-T	GANDY CREEK	15.68	15.68
MC-60-T-1	LOWER TWO SPRING RUN	2.29	2.29
MC-60-T-10	NARROW RIDGE RUN	2.16	2.16

MC-60-T-11	WARNER RUN	2.21	2.21
MC-60-T-2	UPPER TWO SPRING RUN	2.53	2.53
MC-60-T-3	SWALLOW ROCK RUN	1.82	1.82
MC-60-T-6	TAYLOR RUN	0.87	0.87
MC-60-T-8	BIG RUN	3.75	3.75
MC-60-T-9	GRANTS BRANCH	2.80	2.80
MCS	SHAVERS FORK	7.26	7.26
MCS-12	LITTLE LAUREL RUN	1.31	1.31
MCS-13	LITTLE BLACK RUN	4.74	4.74
MCS-14	CLIFTON RUN	2.11	2.11
MCS-15	RATTLESNAKE RUN	5.03	5.03
MCS-16	JOHNS RUN	2.70	2.70
MCS-2	HAWK RUN	1.09	1.09
MCS-22	TAYLOR RUN	2.97	2.97
MCS-22-A	STALNAKER RUN	1.61	1.61
MCS-28	UPPER POND LICK	6.29	6.29
MCS-3	HADDIT RUN	2.68	2.68
MCS-33	FISHING HAWK CREEK	3.60	3.60
MCS-3-A	SOUTH BRANCH	3.56	3.56
MCS-4	JOBS RUN	1.72	1.72
MCS-40	YOKUM RUN	2.56	2.56
MCS-43	GLADE RUN	2.67	2.67
MCS-46	RED RUN	2.75	2.75
MCS-47	BLISTER RUN	1.95	1.95
MCS-48	FISH HATCHERY RUN	2.66	2.66
MCS-49	LAMBERT RUN	3.23	3.23
MCS-5	LAUREL RUN	3.48	3.48
MCS-50	FIRST FORK	5.42	5.42
MCS-54	BEAVER CREEK	1.74	1.74
MCS-55	SECOND FORK	4.15	4.15
MCS-57	BLACK RUN	2.28	2.28
MCS-6	PLEASANT RUN	3.52	3.52
MCS-6-B	AARONS RUN	2.35	2.35
MCS-7	STONELICK RUN	1.68	1.68
MCS-8	LAUREL RUN	1.18	1.18
MCS-9	NAIL RUN	1.74	1.74
		415.11	
Tygart River Watershed			
MT-18-E-5-B	FROG RUN	2.36	2.36
MT-23-F	MILL RUN	4.03	4.03
MT-23-H	MILL RUN	3.72	3.72
MT-38	ZEBS CREEK	4.04	4.04
MT-44	MATHEUS RUN	1.66	1.66
MT-45-C	RIGHT FORK	3.24	3.24
MT-47	BEAVER CREEK	6.20	6.20
MT-50-A	RIGHT FORK OF FILES CREEK	8.33	8.33
MT-50-A-1	LIMEKILN RUN	2.12	2.12
MT-50-B	LEFT FORK FILES CREEK	2.84	2.84
MT-61	SHAVERS RUN	6.95	6.95

MT-64	MILL CREEK	10.69	10.69
MT-64-C	GLADE RUN	1.59	1.59
MT-64-E	MEATBOX RUN	1.19	1.19
MT-64-F	POTATOHOLE FORK	1.84	1.84
MT-66	RIFFLE CREEK	1.91	1.91
MT-66-B	MCGEE RUN	3.40	3.40
MT-66-C	BACK FORK	2.01	2.01
MT-67	RAFE RUN	1.54	1.54
MT-68	BECKY CREEK	9.41	9.41
MT-68-A	BIG BRANCH	2.25	2.25
MT-72	HAMILTON RUN	2.49	2.49
MT-73	CLAY RUN	2.61	2.61
MT-74	ELKWATER FORK	5.20	5.20
MT-74-A	MOWRY RUN	2.34	2.34
MT-74-B	LIMEKILN RUN	1.93	1.93
MT-75	STEWART RUN	8.08	8.08
MT-77	CONLEY RUN	7.10	7.10
MT-78	RALSTON RUN	6.99	6.99
MT-79	WINDY RUN	4.60	4.60
MT-80	LOGAN RUN	2.49	2.49
MT-81	BIG RUN	5.14	5.14
MTB-25-A	RIGHT FORK	3.88	3.88
MTB-27	PANTHER FORK	4.08	4.08
MTB-28	BIG RUN	3.03	3.03
MTB-31	RIGHT FORK	2.24	2.24
MTB-31-B	REGER RUN	1.13	1.13
MTB-31-C	ALEC RUN	1.93	1.93
MTB-31-D	MILLSITE RUN	3.76	3.76
MTB-32	LEFT FORK	6.85	6.85
MTB-32-D	BEARCAMP RUN	5.00	5.00
MTB-32-H	BEECH RUN	4.62	4.62
MTM	MIDDLE FORK RIVER	7.32	7.32
MTM-1	HANGING RUN	4.68	4.68
MTM-11	RIGHT FORK MIDDLE FORK RIVER	7.42	7.42
MTM-11-D	JACKSON FORK	3.88	3.88
MTM-11-E	JENKS FORK	3.70	3.70
MTM-13	LONG RUN	7.66	7.66
MTM-16	CASSITY FORK	4.25	4.25
MTM-16-A	PANTHER RUN	4.43	4.43
MTM-21	PLEASANT RUN	1.82	1.82
MTM-22	LAUREL RUN	2.57	2.57
MTM-23	LAUREL BRANCH	4.00	4.00
MTM-24	SUGAR RUN	2.30	2.30
MTM-25	SCHOOLCRAFT RUN	3.08	3.08
MTM-25-A	BIRCH FORK	1.48	1.48
MTM-26	BIRCH FORK	3.56	3.56
MTM-27	MITCHELL LICK FORK	2.52	2.52
		231.49	

Upper Ohio North

O-102-A	WHITEOAK RUN	0.48	0.48
Twelvepole Creek Watershed			
O-2-H-2-A	STOWERS BRANCH	0.46	0.46
O-2-P-23	ARKANSAS BRANCH	0.75	0.75
O-2-P-25	SWEETWATER BRANCH	2.00	2.00
O-2-P-26	LONG BRANCH	2.59	2.59
O-2-P-27	SPRUCE FORK	1.84	1.84
O-2-Q-14	RICH CREEK	1.32	1.32
O-2-Q-16	BLUELICK BRANCH	2.28	2.28
O-2-Q-18-A	LITTLE LAUREL CREEK	2.09	2.09
		13.33	
Upper Ohio South			
O-77-B	LONG RUN	4.51	4.51
Guyandotte River Watershed			
OG-102	BRICKLE BRANCH	1.64	1.64
OG-29-C	HORSESHOE BRANCH	1.98	1.98
OG-32-F	PLUM BRANCH	2.35	2.35
OG-34-E	STEER FORK	1.64	1.64
OG-37	LITTLE UGLY CREEK	1.42	1.42
OG-38	BIG UGLY CREEK	8.49	8.49
OG-38-A	PIGEONROOST CREEK	3.62	3.62
OG-38-D	LAUREL CREEK	2.60	2.60
OG-61	BUFFALO CREEK	3.01	3.01
OG-96-A	STURGEON BRANCH	1.57	1.57
OGM-8-B	LEFT FORK	2.75	2.75
		31.06	
Potomac Direct Drains Watershed			
P-16	ROCKWELL RUN	10.39	10.39
P-9-G-1	NORTH FORK INDIAN RUN	1.49	1.49
P-9-G-2	SOUTH FORK INDIAN RUN	3.76	3.76
		15.63	
Cacapon River Watershed			
PC-0.9	CONOR HOLLOW	7.73	7.73
PC-1	CONSTANT RUN	5.23	5.23
PC-10	EDWARDS RUN	7.00	7.00
PC-17	HAWK RUN	4.62	4.62
PC-23	TROUT RUN	16.62	16.62
PC-24-H	LOWER COVE RUN	4.63	4.63
		45.83	
North Branch / Potomac River Watershed			
PNB-14	HOWELL RUN	3.83	3.83
PNB-15	DEEP RUN	4.75	4.75
PNB-15-A	CRANBERRY RUN	2.66	2.66
PNB-16-B	WYCKOFF RUN	2.43	2.43

PNB-18 DIFFICULT CREEK	5.17	5.17
PNB-18-B-1 JOHNNYCAKE RUN	3.28	3.28
	22.11	
South Branch / Potomac River Watershed		
PSB-13 MILL RUN	8.95	8.95
PSB-21-F DUMPLING RUN	2.60	2.60
PSB-21-K ROUGH RUN	6.92	6.92
PSB-25-C-2 SPRING RUN	2.98	2.98
PSB-28-A-1 BIG RUN	2.61	2.61
PSB-28-A-2 LAUREL RUN	3.17	3.17
PSB-28-B SAMUEL RUN	2.85	2.85
PSB-28-C BROAD RUN	2.39	2.39
PSB-28-D MOYER FORK	7.92	7.92
PSB-28-E HIGH RIDGE RUN	2.28	2.28
PSB-28-EE BIG RUN	12.84	12.84
PSB-28-EE-2 SAWMILL BRANCH	3.22	3.22
PSB-28-EE-2-A BACK RUN	3.39	3.39
PSB-28-EE-3 TEETER CAMP RUN	3.71	3.71
PSB-28-EE-3-A HEMLOCK RUN	1.91	1.91
PSB-28-EE-3-B LEONARD SPRING HOLLOW	4.64	4.64
PSB-28-EE-3-C MIDDLE RIDGE HOLLOW	4.81	4.81
PSB-28-EE-3-D BUD HOLLOW	3.54	3.54
PSB-28-EE-4 ELK RUN	3.93	3.93
PSB-28-G ZEKE RUN	3.70	3.70
PSB-28-GG-1 VANCE RUN	3.27	3.27
PSB-28-GG-2 SAMS RUN	1.10	1.10
PSB-28-GG-2-A LITTLE LOW PLACE HOLLOW	1.10	1.10
PSB-28-I POWDERMILL RUN	2.84	2.84
PSB-28-K SENECA CREEK	20.26	20.26
PSB-28-K-1 BRUSHY RUN	7.79	7.79
PSB-28-K-2 ROARING CREEK	6.13	6.13
PSB-28-K-2-B LONG RUN	2.23	2.23
PSB-28-K-3 HORSECAMP RUN	4.06	4.06
PSB-28-K-3-B WAMSLEY RUN	1.52	1.52
PSB-28-K-4 STRADER RUN	2.56	2.56
PSB-28-K-5 GULF RUN	1.46	1.46
PSB-28-K-6 WHITES RUN	3.86	3.86
PSB-28-K-6-A LOWER GULF RUN	4.67	4.67
PSB-28-K-6-B UPPER GULF RUN	2.67	2.67
PSB-28-R BLIZZARD RUN	3.60	3.60
PSB-28-S BRIERY GAP RUN	2.65	2.65
PSB-28-T LAUREL RUN	2.74	2.74
PSB-29 REDMAN RUN	3.41	3.41
PSB-30 LONG RUN	2.88	2.88
PSB-32 BRIGGS RUN	4.57	4.57
PSB-33 REEDS CREEK	11.16	11.16
PSB-40 PETERS RUN	5.08	5.08
PSB-47 THORN CREEK	9.08	9.08
PSB-9 MILL CREEK	25.38	25.38

	224.40	
Shenandoah River Watershed (Hardy County)		
S-9-A CAPON RUN	2.19	2.19

Total number of streams	**444**
Total Miles	**2006.80**

WV Environmental Quality Board
NOVEMBER 19, 2001
7:00 P.M.
Sign-In Sheet

NAME:

1) David Flannery
2) Maria Witmer-Rich
3) Michael Bush
4) Dave Yaussy
5)
6)
7)
8)
9)
10)
11)
12)

BEFORE WEST VIRGINIA ENVIRONMENTAL
QUALITY BOARD

PUBLIC HEARING

RE: CHLOROFORM

ORIGINAL

TRANSCRIPT OF PROCEEDINGS had or testimony adduced at a hearing held in the above-styled case, taken pursuant to notice, on the 19th day of November, 2001, commencing at 7:00 p.m. and concluding at 7:20 p.m., at the West Virginia Environmental Quality Board, Washington Street, Charleston, Kanawha County, West Virginia, before Karen A. Reed, Certified Court Reporter and Notary Public.

KAREN A. REED
CERTIFIED COURT REPORTER
P.O. BOX 129
TORNADO, WEST VIRGINIA 25202
(304) 727-4943

APPEARANCES

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DR. CHARLES JENKINS
DR. EDWARD SNYDER
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BECKY CHARLES, Legal Counsel
DAVE FLANNERY
MARIA WITMER-RICH
MICHAEL BUSH
MR. YAUSSY

INDEX

November 19, 2001

MR. SNYDER: Good evening. I don't think I need to introduce the group. I think everyone knows what we're going to be dealing with this evening, which will be revision to Human Health Criteria for Chloroform, Appendix E, Table 1, Section 8.22, and try to come in line with the EPA from our value to what they have. And, Libby, I'll just let you take it from here.

MS. CHATFIELD: That's the essence of it. We are proposing a revision to the Chloroform criterion from 0.19 micrograms per liter to 5.7 micrograms per liter and as Dr. Snyder said that's consistent with -- the new value of 5.7 is consistent with EPA's current value. They have updated their number since the time that we proposed the 0.19 and we're in response to petition received from a number of entities in the regulating community. We are making the revision at this time. We went out to notice with this change on October 19th, 2001, and have had the public comment period open since that time. We will be accepting comments through November 26th at 5:00 p.m. So, any written comments submitted during that time will be considered by the Board as well.

MR. SNYDER: Very good. I think if there's

no discussion by the Board, we'll just open it up for people who want to present it and please be seated and comfortable. Mr. Flannery, would you like to be first?

MR. FLANNERY: I would, thank you. Here is an original of a comment letter. I'll leave that for whoever, but there should be comments and copies for everyone there if you would like to circulate those around. Thank you, I will be seated. I'm Dave Flannery, I'm with Jackson and Kelly, and I'm here this evening representing the State Chamber of Commerce. As Libby Chatfield pointed out, the principal motivation behind changing this is to conform the state criteria, human health criteria for Chloroform to that of the EPA criteria. And we're very much in support of that change being made.

We have taken the liberty of contacting US EPA in advance of the filing of the petition. And we are told by US EPA Region III that if the Board were to make this change, that it would indeed approve that, that that does reflect current EPA policy. We also note and have indicated in the comment letter that we have provided you this evening that this criteria and indeed the standard has been adopted in a number of surrounding states, so we know there is ample precedent for that.

The issue is more than a matter of academic interest for us. You'll hear later from GE Specialty Chemicals who has a very real issue of what their permit for their facility in Morgantown. I am also reminded that the issue comes up in the context of a permit, a general permit, which DEP has issued for the discharge of hydrostatic test water where the current criteria of 0.19 actually appears in there. So that we're seeing DEP do what the law requires us to do and that is to take your water quality standards and put it in permit so that it is that, it's the implementation of that that is sort of a harsh reality of causing these issues to come to our attention and for us to bring to your attention.

We have pursued the issue one additional step and that is that we recognize from the middle of the comment period on this that new data about Chloroform had arisen since EPA had revised its criteria. We at the Chamber of Commerce approached Dr. Brian Harden who is retired from the U.S. Surgeon General's Office to review that data. And attached to the comment that I have provided you is an opinion letter which Dr. Harden has provided. I'll not address that specifically. Your next speaker will address that very issue. And with that, let me stop my comments and thank the Board

for proposing the rule and urge you to finalize this production.

MR. SNYDER: And the next speaker -- and thank you very much and we appreciate the Chamber of Commerce bringing this to our attention -- Ms. Witmer-Rich.

MS. WITMER-RICH: Thank you. I'm Maria Witmer-Rich from Jackson and Kelly, also here on behalf of the West Virginia Chamber of Commerce. As Dave mentioned, we do have a letter that has been attached to the Chamber's comments, which Dr. Brian Harden prepared. His CV is also attached if you're interested in his credentials. The letter does a very good job. It's just simply sort of reviewing the state of science of Chloroform over basically the past 20 years. He describes, first of all, the rationale behind the 1980 Gold Book Value for Chloroform. Secondly, the 1989 National Toxins Rule and describes why that update was made. And then, furthermore, what we were really interested in for completeness was looking at what has transpired in the area of research since 1989.

And very interestingly just this fall, EPA issued a very comprehensive document on water quality for Chloroform, and it's available on the web if you're interested at EPA's website. And they came up with

some interesting conclusions. In fact, quite a bit has happened in the state of science for Chloroform over the past ten or so years. For a while, we have understood that Chloroform is in fact a carcinogen at certain levels. But the mechanism for its carcinogenicity was not actually understood. So, the research over the past ten years has enlightened that.

From what the document -- and it sort of walks you through this -- and it explains that carcinogenic effects are based often on two different things. One would be cytotoxicity or sort of toxicity to a cell, which would result in cellular proliferation or tumor growth, just kind of uncontrolled cellular proliferation. A second would be genotoxic effects or actually toxicity to the genetic material. Not the distinction there is very important because if you have a genotoxic effect, the implication there is that any amount of a substance that you would intake would result in raising your risk for cancer. Even the minutest amount would be a cancer houser for you. It's a genotoxic effect. If in fact it's cytotoxic effect, it's believed that there's a threshold. So, in other words, you can actually have a certain amount. You can have that over days, even, and your risk of cancer is not increased.

So, previous to -- and in fact what the water quality criteria values of 1980 and 1989 are based upon, is in fact they made the default mechanism that it would be the genotoxic effect, if you will. But, in fact, now that they actually realized it was a cytotoxic effect, so in other words now we can make a reference dosage standard. It's, in fact, now appropriate. The former standard was based on the Cumlin Star (phonetic) or cancer potency factor.

Now, having said that, first of all, the obvious question is well what's this going to mean for the ambient water quality criteria that the EPA will establish. Since this report just came out this fall, an update has not yet occurred. However -- and, in fact, it's going to take some time. The reason is because the algorithms for calculating that ambient water quality criteria in the last year have also been updated, they've been made much more complex. And, in fact, they involve some research for the parameters of fish consumption, bio-concentration have been made much more complicated, and, in fact, will involve some research to arrive at those for Chloroform.

So, it's a little hard to arrive at a precise number. However, you'll notice that Dr. Harden walks through this in his memoranda and he gives some

estimates. Now, that we're moving toward a reference dosage for Chloroform as a basis for the ambient water quality criterion, we will actually use a different algorithm, this is all in the future, of course. And he runs through some estimates. And in Appendix A, I believe it's equations 7 and 8, he gives sort of a range there for what we can expect. And the bottom line is the value is going to go up, it's going to become less stringent is what we would anticipate now that the criterion is based on a reference dosage.

He estimates -- and a very conservative estimate would be at about 70 parts per billion and that could go upwards at 280 parts per billion. This is of course -- you know, this is an estimate, but there's really no doubt that, you know, the 5.7 parts per billion standard that we're discussing this evening should fall, in fact, far lower than where we would anticipate this to move in the future. In fact, even on an order of magnitude at least. Thank you for listening to my comments this evening.

MR. SNYDER: Thank you very much for your input. Mr. Bush?

MR. BUSH: Yes, thank you, Mr. Chairman and members of the Board. I am Michael Bush. I am the Health and Safety Manager for our manufacturing

facility in Morgantown, GE Specialty Chemicals. We feel that we have been adversely impacted as a result of the 0.19 standard. Our factory and factories before us have been there for a long time and have traditionally used -- built a riverwalk. When we switched over to municipal water in 1998, we started having a problem meeting our Chloroform affluent limit. We've been under a consumer or administrative order with the Office of Water Quality ever since. We're in the process of permitting the rules and it really came down to the point of our issue has to do with the water quality standard. And therefore we support the petition that's been filed and seek for your support in pushing it on through.

But, you know, speaking also, you know, we see that the science does point to the fact that 5.7 is appropriate. And we also see that unnecessarily restrictive standard, especially on Chloroform, could have an adverse impact in foreseeing facilities like ours and others to move away from controlled potable dependable water sources to less control and less dependable from the sake of human consumption, the sake of fire protection, the sake of a lot of other things, that this unnecessarily restrictive standard could have an adverse impact on other ways we use water in our

businesses and industries.

So, we also, along with the Chamber, have been closely looking at the science to make sure that we feel comfortable in supporting raising a standard. In this case, we feel it is a appropriate. We do not use Chloroform in any other form or fashion. It's not a raw material, it's not a buy product, it's not a laboratory chemical. One hundred percent of the Chloroform coming into our facility is from municipal drinking water and it is adversely affecting our business, and we feel it's unnecessarily restrictive. So, thank you.

MR. SNYDER: Thank you for your input. And I will say so far as attention, always use the -- Chamber of Commerce has here the latest and best available scientists as things work out we're protecting people who still can allow things to continue to function in the state, which is very important to us. Mr. Yaussy?

MR. YAUSSY: Mr. Chairman, I have nothing to add to what's been said here tonight.

MS. CHATFIELD: I will add that we received some comments from the West Virginia River Coalition today, some comments that I think we'll make sure get copies if that's not already been done. And those are all the comments?

MR. BUSH: I do have just one letter.

MS. CHATFIELD: Okay.

MR. SNYDER: Again, you have until the 26th at 5:00 p.m.

(WHEREUPON, the hearing was concluded at 7:20 p.m.)

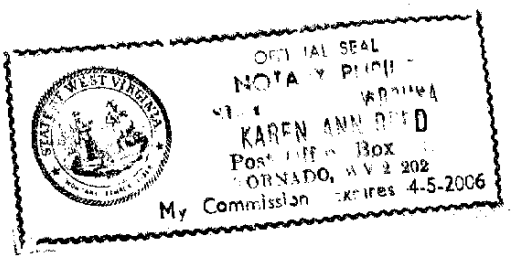
REPORTER'S CERTIFICATE

STATE OF WEST VIRGINIA,

WEST VIRGINIA ENVIRONMENTAL QUALITY BOARD, to-wit:

I, the undersigned, Karen A. Reed, Certified Court Reporter, hereby certify that the foregoing is, to the best of my skill and ability, a true and accurate transcript of proceedings had and evidence adduced at a hearing held in the above-styled case, on the 19th day of November, 2001.

Court Reporter
Notary Public



WEST VIRGINIA CHAMBER OF COMMERCE
The Voice of Business in West Virginia

November 19, 2001

West Virginia Environmental Quality Board
1615 Washington Street East
Charleston, West Virginia 25312

Re: Chloroform Water Quality Standard – Human Health Criterion

Dear Members of the Board:

The West Virginia Chamber of Commerce is pleased to provide the following comments in support of the proposed change to the West Virginia chloroform Category A water quality standard from the current 0.19 *u*g/l to 5.7 *u*g/l.

This proposed change will bring our state water quality standard into conformance with the federal guidelines, ***the latest and best available science***, and West Virginia's nominal human health protection criteria.

For the following reasons, we strongly urge the Board's adoption of the revised standard:

- Changing the Category A waters chloroform standard to 5.7 *u*g/l would make West Virginia's standard consistent with EPA's current chloroform water quality criterion.

- Changing the Category A waters chloroform standard has been encouraged and is supported by USEPA.

- Changing the Category A waters chloroform standard will place West Virginia at a regulatory level comparable to other Region III states. Virginia, Delaware and Pennsylvania, at least, all have adopted EPA's 5.7 *u*g/l human health criterion.

- Changing the Category A waters chloroform standard will help eliminate substantial adverse regulatory impact on sources subject to NPDES permitting as the result of the imposition of water quality based effluent limitations. This is particularly the case for those facilities that use significant quantities of treated water in their manufacturing processes.

P.O. Box 2789, Charleston, West Virginia 25330-2789 • VOICE: 304/342-1115 • FACSIMILE: 304/342-1130 • ForJobs@wvchamber.com

- Changing the Category A waters chloroform standard will greatly reduce the disincentive for West Virginia sources from using and discharging treated waters.

- The change which has been proposed by the Board is supported by the attached opinion letter of nationally recognized toxicologist Bryan D. Hardin Ph.D. At the request of the West Virginia Chamber of Commerce, Dr. Hardin reviewed the state of the science of chloroform since USEPA last published its chloroform human health criteria. Dr. Hardin finds that today's science on chloroform supports an increase in the human health based water quality standard for chloroform to at least the level of 5.7 *ug/l*.

Respectfully submitted this 19th day of November, 2001.

Stephen G. Roberts, President
West Virginia Chamber of Commerce

cc: Charles R. Jenkins, Ph.D.
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GLOBAL TOX

November 14, 2001

Our ref: 5293

Mr. Stephen G. Roberts
President
West Virginia Chamber of Commerce
P.O. Box 2789
Charleston, WV 25330-2789

Dear Mr. Roberts:

In response to your request, I have reviewed the proposal of the West Virginia Environmental Quality Board to revise the water quality standard for chloroform, focusing on the appropriateness of that proposal in light of the current state of the science related to chloroform.

I reviewed EPA's 1980 Ambient Water Quality Criteria for Chloroform (1) and its 1989 Water Quality Criteria Document Addendum for Chloroform (2) and the rationale therein for revising the 1980 chloroform water quality criterion. In my judgment, EPA acted in accordance with the then-current scientific understanding in 1989 by increasing the water quality criterion for a 1 in one million (10^{-6}) human cancer lifetime risk estimate from 0.19 µg/L to 5.7 µg/L.

I also reviewed significant scientific papers that were published after 1989 on chloroform and other disinfection byproducts. Coincidentally, on October 19, 2001, EPA published a full Toxicological Review of Chloroform (3) and revised IRIS file for chloroform (4). In this new evaluation of chloroform EPA has determined that cancer effects seen in animals were secondary to cellular proliferative effects of chloroform; EPA concluded that chloroform would not be expected to be carcinogenic at levels of exposure low enough to avoid a proliferative response. On that basis, the October 2001 document established an oral cancer reference dose (RfD) of 10 µg/L/day. In my judgment EPA has again acted in accordance with current scientific understanding of the mode and mechanism of action involved in chloroform carcinogenicity.

1980 Ambient Water Quality Criteria for Chloroform (1): The critical study was a 1976 National Cancer Institute carcinogen bioassay in rats and mice exposed to chloroform by gavage in corn oil (5). In that NCI study male and female Osborne-Mendel rats and male and female B6C3F1 mice were gavaged with chloroform in corn oil once daily, 5 days/week for 78 weeks. Male rats showed a dose-related, statistically significant increase in kidney epithelial tumors. Both sexes of mice showed a dose-related, statistically significant increase in hepatocellular carcinomas. In accordance with

scientific and risk management conventions of the time EPA treated carcinogenic response as a non-threshold, irreversible process with some finite residual risk remaining at any dose, no matter how low. EPA applied a linearized multistage (LMS) model to the NCI data (hepatocellular carcinomas in female mice) and calculated a unit risk (q_1*) of 0.18272 (mg/kg/day)$^{-1}$. Application of that q_1* to an assumed daily consumption of 2 liters of drinking water and 6.5 g of fish and shellfish produced the 1 in one million risk level of 0.19 µg/L (see equations [1] and [2] in Attachment A) .

1989 Addendum for Chloroform (2): By the time EPA published this revision, the evidence for carcinogenicity in animals had become less clear and was not entirely consistent. Whereas the positive NCI study had used a corn oil vehicle to dose Osborne-Mendel rats and B6C3F1 mice, EPA reviewed studies in which no carcinogenic response was seen in Sprague-Dawley (6) and Wistar (7, 8) rats administered chloroform in an aqueous vehicle (toothpaste or drinking water, respectively), in three strains of mice (C57Bl, DBA, and CF/1) dosed with chloroform in toothpaste (9), or in beagle dogs dosed with chloroform in toothpaste (10). Chloroform in toothpaste did produce kidney tumors in male but not female ICI mice, but a more pronounced kidney tumor response was produced in that strain by the same dose of chloroform administered in arachis oil (9). Subchronic studies (11) in B6C3F1 mice had demonstrated that chloroform administered by gavage was more toxic in corn oil vehicle than when administered in water. EPA also reviewed initiation-promotion studies in which B6C3F1 mice (12) and Sprague-Dawley rats (13) initiated with the liver carcinogen DENA (diethylnitrosamaine) had a reduced tumor yield when chloroform in drinking water followed DENA treatment.

In view of the evidence that an oil vehicle enhanced hepatotoxicity and hepatic carcinogenic effects of chloroform, and because a drinking water study is more directly relevant for derivation of a drinking water standard, EPA in 1989 (2) used as the critical study a carcinogenic bioassay in rats and mice exposed to chloroform in drinking water (14). Like the NCI study (5) relied upon previously, this study employed Osborne-Mendel rats (males only) and B6C3F1 mice (females only). These animals were exposed for 104 weeks to chloroform in drinking water at four concentrations ranging from 200 to 1800 mg/L. Group sizes were 50 animals of each species at the two higher exposure levels (900 and 1800 mg/L) and in a distilled water control with water consumption restricted to match that of the rats and mice in the 1800 mg/L exposure groups. The *ad libitum* water control and the 200 mg/L groups consisted of 330 rats and 430 mice, while the 400 mg/L groups consisted of 150 animals of each species. This design enhanced the ability to detect low-dose responses. There was no treatment-related increase in tumor incidence among female mice. In rats the only treatment-related neoplastic response was a statistically significant dose-related increase in kidney tumors (tubular cell adenomas and adenocarcinomas). In contrast to the earlier NCI study, there was no evidence of hepatic tumors in either species despite the longer duration (104 vs. 78 weeks), more frequent dosing (7 vs. 5 days/week), and overlapping time-weighted average doses (34, 65, 130, and 263 mg/kg/day in drinking water vs. 238 and 477 mg/kg/day by corn oil gavage). Continuing to treat the carcinogenic response as a non-threshold, irreversible process, EPA applied the LMS model to these data (kidney

tumors in male rats) and calculated a q_1^* of 6.1×10^{-3} $(mg/kg/day)^{-1}$. Applying that revised q_1^* to the same assumptions for daily consumption of drinking water and fish or shellfish, the revised EPA 1 in one million risk level was 5.7 µg/L (see equation [3] in Attachment A) .

2001 Toxicologic Review of Chloroform (3) and RfD determination (4): An extensive body of literature has developed since EPA published its 1989 Addendum for Chloroform (2). Epidemiologic studies of human populations exposed to chlorinated drinking water have tended to suggest weak associations with various adverse reproductive outcomes (15-32) and cancers (33-50). Exposure characterization is not attempted in some of these studies and is problematc at best when it is attempted, including in those studies that attempted to estimate past exposures to total trihalomethanes, chloroform, or other individual disinfection by-products; specific adverse events or target organs are not consistent across the entire body of literature. Consequently, these findings are suggestive of the need for further research but cannot be interpreted as establishing a causal association between reproductive effects or cancer in humans and exposure to chlorinated drinking water. They have even less probative value relative to implicating chloroform *per se* as causing human cancer or adverse reproductive outcomes. A similar conclusion was reached in the 2001 EPA toxicological review (3) as well as in other detailed reviews of disinfection by-products or chloroform health effects (51-57).

Included in the literature evaluated by EPA in 2001 was an extensive body of research on the mechanism and mode of action of chloroform carcinogenicity in animals. A number of investigators confirmed and extended earlier observations (11) that chloroform toxicity is enhanced in oil relative to drinking water administration (58, 59). These same investigators (60-62) demonstrated in a series of studies that chloroform did not induce DNA repair in the livers of B6C3F1 mice (hepatocellular tumors in B6C3F1 mice in the NCI study (5) having been the basis for the EPA 1980 q_1^*). However, these investigators did observe that chloroform in corn oil at the dose that was tumorigenic in the NCI study produced hepatic necrosis with sustained regenerative cellular proliferation. Taken together, these observations are consistent with an hypothesis that the observed tumorigenic response occurred by a nongenotoxic mechanism.

Of particular significance was a detailed reevaluation (63) of renal histopathology in male rats from the Jorgenson et al. study (14) used by EPA to establish the 1989 q_1^*. Kidney slides from that study revealed subtle evidence of chronic tubule cell injury appearing in the kidneys of rats from the higher two dose groups, 1800 and 900 mg/L. These changes were more frequent, more severe, and were seen after shorter duration of exposure in the 1800 mg/L group than in the 900 mg/L group. This correlated with the incidence of kidney tumors in the Jorgenson et al. study in that kidney tumors were statistically significantly increased at 1800 mg/L and increased but not significantly so at 900 mg/L. Furthermore, kidney tumors appeared to originate in association with these areas of chronic tubule cell injury. No such evidence of chronic tubule cell injury was seen in control kidneys or kidneys from either of the two lower doses employed, 200 and 400 mg/L, in which there also was not a tumorigenic response. A limited evaluation of

kidney slides from control and high-dose animals in the earlier NCI study revealed similar but more severe lesions accompanied by a higher tumor incidence than was seen in the Jorgenson et al. drinking water study. These observations lend strong support to the hypothesis that cytotoxicity and cellular proliferation precedes the tumorigenic response. Along with EPA (3), other comprehensive reviews have arrived at that same conclusion (53, 55, 64-66).

Having concluded that chloroform is carcinogenic in rodents by way of a nongenotoxic, nonlinear mechanism, EPA further determined that prevention of the cellular proliferative response will avoid a carcinogenic response (3). On that basis and in accordance with new draft guidelines for cancer risk assessment (67), EPA adopted as the oral cancer RfD the chronic oral RfD of 10 µg/kg/day, which was first published in EPA's Integrated Risk Information System (IRIS) in 1992 based on a study by Heywood et al. (10) using hepatic "fatty cysts" as the critical effect. In that study, gelatin capsules were used to orally dose male and female beagle dogs (8 of each sex per group) 6 days/week for 7 ½ years with a toothpaste base containing chloroform (15 or 30 mg/kg/day). Although a few tumors were seen in both treated and control animals, there was no evidence of a treatment-related induction of tumors and no tumors were seen in the liver or kidney of any dog. Serum levels of the liver enzyme ALT (designated SGPT at the time) were increased in a treatment-related fashion, but gradually returned to control levels during a 20-24 week recovery period. Nodules of altered hepatocytes and "Aggregations of vacuolated histiocytes forming so-called 'fatty cysts'" were seen in the livers of dogs from all groups, including controls, but tended to be larger or more numerous in treated dogs, particularly at the 30 mg/kg/day dose.

For the 2001 oral cancer RfD EPA noted it might use the NOEL-LOEL / UF approach previously used to establish the non-cancer oral RfD, or the benchmark dose approach (which was preferred by EPA). Coincidentally, when applied to the Heywood et al. study in beagle dogs (10) with hepatic "fatty cysts" as the critical effect both approaches yielded the same oral cancer RfD: 10 µg/kg/day.

Previously, in 1994, the World Health Organization's International Programme on Chemical Safety (IPCS) (55) had treated the carcinogenic response as a threshold phenomenon and had recommended a "tolerable daily intake" (TDI) of 10 µg/kg/day based on a NOEL-LOEL / UF approach to the cytotoxic and cell proliferation responses in B6C3F1 mice as reported by Larsen et al. (62). In 1998 the WHO developed (65, 66) a chloroform TDI of 13 µg/kg/day based on the same beagle dog study (10) and the same NOEL - LOEL / UF approach used by EPA in 1992 and 2001 (4) to derive the non-cancer oral RfD.

Implications for a Revised WQC: Substituting the 10 µg/kg/day RfD in the standard equation EPA has used in the past for WQC calculations based on an oral RfD suggests an increase from the current 5.7 µg/L to 345 µg/L (see equations [4] and [5] in Attachment A).

A lower WQC is likely, however, in view of a recently published revised approach to deriving ambient water quality criteria (see equation [6] in Attachment A) (68). Although it is not clear exactly how that new approach will be implemented, it suggests that the final ambient water quality criterion (AWQC) for chloroform is likely to fall between 65 and 275 µg/L (see equations [7] and [8] in Attachment A).

In 1998 the WHO used its 13 µg/kg/day TDI to develop a limit for chloroform in drinking water. WHO assumed a human body weight of 60 kg (vs the EPA default of 70 kg) and also assumed that only 50% of total daily chloroform intake is derived from drinking water (corresponding to RSC = 0.5 in equation [6] of Attachment A). Like EPA, the WHO also assumed drinking water consumption to be 2 L/day and on that basis recommended a chloroform guideline of 200 µg/L (65, 66).

Conclusion: EPA's progressive upward revision of allowable chloroform exposures (or, phrased differently, the progressive downward revision of the degree of cancer risk) is consistent with and justified by the progression of scientific understanding. It is generally accepted that chloroform has little or no potential to produce genetic damage and that its carcinogenicity in animal studies has been secondary to cytotoxicity leading to a proliferative response. Available epidemiologic studies are not suitable to establish whether exposure to chlorinated drinking water (or chloroform in drinking water) poses a risk of cancer in humans. Present scientific understanding and risk management practice recognize that some carcinogens, of which chloroform is one, act by non-genotoxic threshold mechanisms. EPA has correctly evaluated the body of science relating to chloroform. EPA's action in basing this new oral cancer RfD on prevention of cytotoxicity is consistent with current scientific understanding and is the appropriate risk management approach. Similarly, the proposal by the West Virginia Environmental Quality Board to increase the human health criteria for chloroform to at least 5.7 ug/L is consistent with and supported by current scientific data.

Sincerely,

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Attachment A

Calculations of Water Quality Criteria (WQC)

Calculations of Water Quality Criteria (WQC) based on a q_1*: The following represents the equation used by EPA in 1980 and 1989 for derivation of the ambient water quality criteria based on the q_1*:

$$WQC = \frac{10^{-6} \times BW \times 1000 \text{ ug/mg}}{q_1^* \times [DI + (FC \times BCF)]} \quad [1]$$

Where:

WQC = Water Quality Criterion (ug/L)
BW = Human body weight (default = 70 kg for adults)
q_1* = Unit risk factor (kg-day/mg)
DI = Drinking water intake (default = 2 L/day for adults)
FC = Fish Consumption (default = 0.0065 kg/day for adults)
BCF = Bioconcentration factor (3.75 L/kg for chloroform)

Derivation of 1980 WQC: The q_1* used in 1980 was 0.18272 kg-day/mg based on the 1976 NCI carcinogen bioassay (5). Substituting that q_1* into equation [1] yields:

$$WQC = \frac{10^{-6} \times 70 \text{ kg} \times 1000 \text{ µg/mg}}{0.18272 \text{ kg-day/mg} \times [2 \text{ L/d} + (0.0065 \text{ kg/d} \times 3.75 \text{ L/kg})]} \quad [2]$$

$$= \frac{70 \times 10^{-3} \text{ kg-µg/mg}}{0.18272 \text{ kg-day/mg} \times 2.024 \text{ L/d}} = \frac{0.07 \text{ kg-µg/mg}}{0.3699 \text{ kg-L/mg}} = \underline{0.19 \text{ µg/L}}$$

Derivation of the 1989 WQC: The q_1* used in 1989 was 6.1×10^{-3} (0.0061) kg-day/mg based on the 1985 Jorgenson et al report (14). Substituting that q_1* into equation [1] yields:

$$WQC = \frac{10^{-6} \times 70 \text{ kg} \times 1000 \text{ µg/mg}}{0.0061 \text{ kg-day/mg} \times [2 \text{ L/d} + (0.0065 \text{ kg/d} \times \times 3.75 \text{ L/kg})]} \quad [3]$$

$$= \frac{70 \times 10^{-3} \text{ kg-µg/mg}}{0.0061 \text{ kg-day/mg} \times 2.024 \text{ L/d}} = \frac{0.07 \text{ kg-µg/mg}}{0.0123 \text{ kg-L/mg}} = \underline{5.67 \text{ µg/L}}$$

Calculations of Water Quality Criteria (WQC) based on an RfD: The equation that has been used in the past by EPA to derive a Water Quality Criterion based on RfD values is:

$$WQC = \frac{RfD \times BW \times 1000 \text{ ug/mg}}{DI + (FC \times BCF)} \quad [4]$$

Where:

WQC = Water Quality Criterion (µg/L)
RfD = Reference Dosage (mg/kg-day)
BW = Human body weight (default = 70 kg for adults)
DI = Drinking water intake (default = 2 L/day for adults)
FC = Fish Consumption (default = 0.0065 kg/day for adults)
BCF = Bioconcentration factor (3.75 L/kg for chloroform)

Derivation of a new WQC based on the October 2001 RfD: In its October 2001 Toxicology Profile and revised IRIS file (3, 4), EPA derived an oral cancer RfD of 0.01 mg/kg-day based on liver effects seen in Heywood et al. (10) Substituting that RfD value into equation [4]

$$WQC = \frac{0.01 \text{ mg/kg-day} \times 70 \text{ kg} \times 1000 \text{ µg/mg}}{2 \text{ L/day} + (0.0065 \text{ kg/day} \times 3.75 \text{ L/kg})} \quad [5]$$

$$= \frac{700 \text{ µg/day}}{2.024 \text{ L/day}} = \underline{345.8 \text{ µg/L}}$$

However, in October 2000 EPA published new guidance on deriving ambient water quality criteria (68). In this document, updated equations were published from which ambient water quality criteria are to be derived. The following is the updated equation for derivation of the ambient water quality criteria based on an RfD:

$$AWQC = RfD \times RSC \times \frac{BW \times 1000 \text{ ug/mg}}{DI + \sum_{i=2}^{4} (FI_i \times BAF_i)} \quad [6]$$

Where:

AWQC = Ambient Water Quality Criterion (µg/L)
RfD = Oral Reference Dose (mg/kg-day)
RSC = Relative source contribution factor to account for non-water sources of exposure.
BW = Human body weight (default = 70 kg for adults)
DI = Drinking water intake (default = 2 L/day for adults)
FI_i = Fish Intake at trophic level i (i = 2, 3, and 4). Trophic level breakouts for the general adult population and sport anglers are TL_2 = 0.0038 kg/day, TL_3 = 0.0080 kg/day, TL_4 = 0.0057 kg/day.
BAF_i = Bioaccumulation factor at trophic level i (i = 2, 3, and 4) lipid normalized (L/kg)

In equation [6] the denominator term:

$$\sum_{i=2}^{4} (FI_i \times BAF_i)$$

replaces (FC x BCF) in the denominator of equations [1] and [4]. However, EPA staff have indicated (personal communication, Cindy Roberts) that fish intake (FI_i) and

bioaccumulation (BAF_i) factors for the various trophic levels have not been established. Whatever ultimately is established for those factors and that term, the denominator will continue to be determined largely by the drinking water (DI) component, 2 L/day. The best available approximation for the new denominator term in equation [6] is (FC x BCF) as in equations [1] and [4]:

$$FC \times BCF = 0.0065 \text{ kg/day} \times 3.75 \text{ L/kg} = 0.024 \text{ L/day}$$

Although the RSC (Relative Source Contribution) factor in equation [6] is new, it is implicitly present and equal to 1 in equations [1] and [4], i.e., those equations assume by the omission of any adjustment factor that 100% of chloroform intake is accounted for by those equations. EPA staff have indicated (personal communication, Cindy Roberts) that no decision has been made as to what the RSC factor should be for chloroform, but factors ranging from 0.2 to 0.8 have been proposed. (see 40 CFR Vol. 63 No. 241).

If the RSC factor remains at unity until some other decision is made and if (FC x BCF) = 0.024 L/day is used until FI_i and BAF_i factors are established, then equation [6] reduces to equation [4], which provides an AWQC of 345.8 µg/L (equation [5]).

However, the wide range of proposed RSC values suggest a similarly wide range of potential AWQCs:

$$0.2 \times 345.8 \text{ µg/L} = \underline{69.16 \text{ µg/L}} \quad \textbf{(7)}$$

$$0.8 \times 348.8 \text{ µg/L} = \underline{276.6 \text{ µg/L}} \quad \textbf{(8)}$$

Thus it seems probable that the final AWQC for chloroform will be more than 10 times higher than the present 5.7 µg/L criterion, and may range upwards as high as 275 µg/L.

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GLOBAL TOX

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Witness for NIOSH in United States District Court for the Western District of Louisiana, Lafayette-Opelousas Division, in Methane Awareness Resource Group et al. v. United States of America et al. (lawsuit challenging NIOSH and NCI scientific peer review of an epidemiologic study of lung cancer in diesel-exposed underground miners), April 16 and 17, 1997

Lead witness (Logging, Walking & Working Surfaces, Hazardous Waste, Vehicle Safety, Glycol Ethers, Respiratory Protection, Tuberculosis) or member of CDC/NIOSH testimony team (Bloodborne Disease) at public hearings for proposed OSHA regulations

Lead witness for DHHS at hearing conducted by the Ad Hoc Subcommittee on Consumer and Environmental Affairs of the Senate Committee on Government Affairs, presenting testimony on potential health risks of police radar guns, August 10, 1992.

Witness for the DHHS Office of General Council at an arbitration hearing, presenting testimony pertaining to the NIOSH CIB #54 on Environmental Tobacco Smoke, San Francisco, CA, November 15, 1991

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Criteria for a Recommended Standard: Occupational Exposure to Inorganic Arsenic - New Criteria 1975. US Department of Health Education and Welfare, 1975.

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SELECTED INTERAGENCY ACTIVITIES

Member, Expert Panel to Assess the Validation Status of FETAX (Frog Embryo Teratogenesis Assay) for the NIEHS/NTP Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM) and the Interagency Center for the Evaluation of Alternative Toxicological Methods (NICEATM). February - June 2000

Member, Endocrine Disruptor Screening and Testing Advisory Committee, US EPA, November 1996 to June 1998

Member, Integrated Risk Information System (IRIS) Peer Review Panel for Vinyl Chloride, US EPA, June 3 & 4, 1997

Co-Chair of Surgeon General's Task Force on Clarification of the Mission and Use of the Commissioned Corps of the US Public Health Service, September - November, 1996

Committee on the Environment and Natural Resources, January 1994 - December 1996
Subcommittee on Risk Assessment
Subcommittee on Toxic Substances, Hazardous & Toxic Waste

Interagency Working Group on Environmental Justice, July 1994 - July 1995
Task Force on Interagency Projects

Committee to Coordinate Environmental Health Related Programs (Chaired by the Assistant Secretary for Health, DHHS). Chairman of Task Groups charged with:

"Evaluation of the Implementation and Relevance in 1990 of 'Risk Assessment and Risk Management of Toxic Substances -- 1985'" February to April 1990.

Review of EPA Draft Health Assessment Document for 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds Chapter 7 -- Epidemiology/Human Data, 1993

Review of EPA Draft Health Assessment Document for 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds Chapter 9 -- Risk Characterization, May to August 1994

TSCA Interagency Testing Committee, April 1987 to July 1989 (Vice-Chairman, 1988; Chairman, 1989).

TSCA Comprehensive Assessment Information Rule Interagency Workgroup

National Toxicology Program: Reproductive and Developmental Toxicology Work Group, responsible for coordinating NTP-sponsored reproductive research, September 1980-September 1986.

NIOSH Working Group to develop A Proposed National Strategy for the Prevention of Work-Related Disorders of Reproduction, May 1985 to April 1987 (Chairman).

Office of Toxic Substances, EPA: Toxicology Testing Work Group to develop testing guidelines for implementation of the Toxic Substances Control Act, September-December 1978.

SELECTED INTERNATIONAL ACTIVITIES

International Consultation on the International Labor Organization WorkSafe Program, Geneva, Switzerland, December 13-14, 1999.

VI Latin American Congress on Occupational Health – ALSO '99 / XIX Colombian Congress on Occupational Medicine and Health, Cartagena, Colombia, September 14 - 17, 1999 (Scientific presentation on Experimental Studies of the Reproductive Effects of the Ethylene Glycol Ethers)

Joint EU/US Conference on Health and Safety At Work, organized as a part of the Joint EU/US Action Plan under the New Transatlantic Agenda of 1995, Luxembourg, October 13 - 16, 1998. (Head of NIOSH delegation, session co-chair, and presenter of closing remarks for the US)

International Seminar of Governmental Entities in the Area of Labor Safety and Health, sponsored by FUNDACENTRO, Ministerio do Trabalho, and International Labor Office, Brasilia (March 17 - 19, 1997) and Sao Paulo (March 20 - 21, 1997), Brazil.

International Labor Office / International Occupational Safety and Health Information Centre: Member of Steering Committee for International Hazard Datasheets on Occupations, March 1995 to 1998.

Planning and Scientific Committees for International Symposium on Health Hazards of Glycol Ethers, Co-sponsored by French INRS, Swedish NIOH, and NIOSH in Nancy, France, April 19-21, 1994. (Conference President and presenter of opening and closing remarks)

International Agency for Research on Cancer: Member of Working Group on the Evaluation of the Carcinogenic Risk of Chemicals to Humans (drafted "Reproductive and Developmental Effects" sections of monographs) :

> Occupational Exposures of Hairdressers and Barbers and Personal Use of Hair Colourants; Some Hair Dyes, Cosmetic Colourants, Industrial Dyestuffs and Aromatic Amines, Lyon, October 6-13, 1992 (IARC Monographs, Volume 57)
>
> Some Chemicals Used in Plastics and Elastomers, Lyon, June 11-18, 1985 (IARC Monographs, Volume 39).

Tri-Lateral meeting of United States, Canadian, and European Economic Community representatives regarding international harmonization of hazardous chemical labeling standards, Brussels, Belgium, April 29-30, 1991

U.S. - Mexican Joint Technical Seminar on the Iron and Steel Industry, Occupational Safety and Health Prevention Systems, Mexico City, Mexico, February 10-12, 1992.

WHO Collaborating Centers in Occupational Health - Informal consultation of the planning group, Geneva, Switzerland, October 7-9, 1991.

World Health Organization - International Programme on Chemical Safety:

Chairman of Expert Consultation on Harmonization in Chemical Hazard Communication, Geneva, Switzerland, April 24-26, 1991.

Working Group to draft "Principles and Methods for the Assessment of Risk from Exposure to Chemicals," Carshalton, Surrey, England, February 26 to March 2, 1990.

Task Groups for Environmental Health Criteria Documents on Glycol Ethers, 1-Propanol, and 2-Propanol, Carshalton, Surrey, England, April 4-14, 1989 (Chairman of 1- and 2-Propanol Task Groups).

Coke Oven Emissions as an Occupational Health Hazard, presented at the Symposium on the Quality of the Environment and the Iron and Steel Industry, Results and Prospects, sponsored by the Commission of the European Community, 24-26 September 1974, Luxembourg, (Grand Duchy).

MEMBERSHIPS

American Association for the Advancement of Science
American Industrial Hygiene Association
American Public Health Association
Sigma Xi, The Scientific Research Society
Teratology Society

OTHER PROFESSIONAL ACTIVITIES

Member, AIHA Emergency Response Planning Guidelines (ERPG) Committee, 2001- Present

Menber, Advisory Board for the Risk Education Project, American Chemical Society, 1997 - 2000

Member, American Industrial Hygiene Association Journal Editorial Advisory Group, 1995 - 2000

Member, Steering Committee, ILSI/Risk Science Institute - EPA Project on Human Variability, 1995-1997

Teratology Society: Public Affairs Committee 1985-1988
Constitution and Bylaws Committee 1993-1996 (Chair 1995-1996)

Ph.D. Qualifying and Dissertation Committees, Kettering Laboratory, University of Cincinnati College of Medicine

Guest lecturer in graduate-level courses in environmental and occupational health risk assessment and policy at the University of Cincinnati, Uniformed Services University of Health Sciences, and George Washington University.

GE Specialty Chemicals, Inc.

GE Specialty Chemicals, Inc.
General Electric Company
1000 Morgantown Industrial Park
Morgantown, WV 26501
304 296-2554

November 14, 2001

West Virginia Environmental Quality Board
1615 Washington Street East
Charleston, West Virginia 25312

Re: Chloroform Water Quality Standard

Dear Members of the Board:

GE Specialty Chemicals, Inc. (GESC) supports a change to the West Virginia chloroform Category A water quality standard from the current 0.19 *ug*/l to 5.7 *ug*/l.

The GESC facility in Morgantown, WV uses municipal water (city drinking water) in its manufacturing processes, for human consumption and for other reasons. The Morgantown Utility Board supplies GESC's municipal water. The municipal water supplied to GESC meets the federal criteria for public water supplies for chloroform. However, the incoming municipal water contains chloroform at levels 195 times higher than the current water quality standard. After use of the water in GESC's facility, our treatment processes significantly reduces the amount of chloroform but cannot meet the extremely low current standards. The unnecessarily restrictive State chloroform standard of 0.19 ug/l makes it practically impossible for facilities to use or treat municipal water and meet this standard.

The current unnecessarily restrictive State chloroform standard can have other undesirable side effects by forcing facilities to switch away from municipal water to other water sources. This could result in water supplies that are untreated or uncontrolled to supply WV business and industry just to meet this unnecessarily restrictive standard.

As you know, the USEPA revised its chloroform standard to 5.7 ug/l based on the latest and best available science and on a incremental cancer risk level of one-in-one million (10^{-6}) for priority pollutants in surface waters that are regulated as carcinogens. GESC requests that WV adopt the revised standard.

Should you have any questions, please contact Michael Bush at the above address.

Sincerely yours,

Mike Burton
Site Manager

WEST VIRGINIA RIVERS COALITION

801 N. Randolph Avenue • Elkins, West Virginia 26241 • (304) 637-7201 • www.wvrivers.org

November 19, 2001

Dr. David Samuel, Chair
West Virginia Environmental Quality Board
1615 Washington St., East, Suite 301
Charleston, WV 25311-2126

Dear Dr. Samuel:

On behalf of the West Virginia Rivers Coalition (WVRC), I am submitting these comments pertaining to the Board's proposed revision to the numeric criterion for chloroform applicable to the public water supply designated use (Category A) from 0.19 ug/liter to 5.7 ug/liter. Given that chloroform is carcinogenic and moderately toxic – and also can cause respiratory depression, coma, kidney damage, liver damage, nausea and vomiting, dizziness, fatigue, headache – we are wary when the allowable limit for such a pollutant is relaxed by 30 times.

WVRC opposes the wholesale weakening of the state's chloroform standard, since to our knowledge only a single discharger, GE Specialty Chemicals, Inc. of Morgantown, has had an issue with this standard. (NPDES Permit No. WV0004740). If the 0.19 ug/liter standard is problematic for one or even a few dischargers, perhaps there are other avenues to address these individual problems besides a statewide weakening of an otherwise protective standard.

While the State of West Virginia is obligated to comply with federal water quality laws, to its citizens' benefit, the State is fortunate to have the ability to enact water quality standards that are more protective than federal standards. Section 510 of the Clean Water Act says that states ". . .may not adopt or enforce any effluent limitation, or other limitation, effluent standard, prohibition, pretreatment standard, or standard of performance which is <u>less stringent</u> than the effluent limitation, or other limitation, effluent standard, prohibition, pretreatment standard, or standard of performance under this Act. . ." (emphasis added). Nothing in this section prohibits states from enacting water quality standards that are more protective than federal standards. Moreover, Section 1.4 of the U.S. Environmental Protection Agency Water Quality Standards Handbook (Second Edition) clearly states that "States may develop water quality standards more stringent than required by the Water Quality Standards Regulation."

We continue to be disappointed that the State of West Virginia – and in many instances the W.Va. Environmental Quality Board – in developing and enforcing environmental protections, often errs on the side of lowest common denominator safeguards. We continue to hope that the Board will treat the state's outstanding rivers and streams as deserving of more than minimal protections, and will see strong environmental regulations as imperative for a high quality of life, a friendly climate for clean and profitable business, and a healthy economy.

Thank you for the opportunity to comment.

Sincerely,

Nathan Fetty
Issues Coordinator

RESPONSES TO COMMENTS and EXPLANATION OF PROPOSED AMENDMENTS
46 CSR 1
Requirements Governing Water Quality Standards
December 20, 2001

This document describes a change proposed to the Water Quality Standards legislative rule. To explain the change, the following are provided: a description of the existing rule; the amendment proposed by the Board in its October 19, 2001 Notice of Public Hearing; a summary of the comments received on the proposed amendment, the Board's response to the comments and the final action taken by the Board on the proposed amendment.

APPENDIX E

This Appendix outlines numeric criteria applicable to designated use categories.

Proposed Change

Section 8.22 – Organics. The Board proposes to revise the numeric criterion for chloroform applicable to Category A, Public Water Supply designated use. The current value is 0.19 ug/liter; the Board is proposing to revise the number to 5.7 ug/liter.

Comments Received and Board Responses

1. One commenter expressed support for the proposed revision, indicating that the proposed 5.7 ug/liter value is USEPA's recommended value for protection of human health, and is based on the latest and best available science. Further comments indicated that the 5.7 ug/liter value is in place in several states surrounding West Virginia.

The Board agrees with these comments.

2. Comments received from a NPDES permit holder explained the impacts of the revision to their facility, indicating that they use municipal drinking water in their manufacturing process. The incoming city water has concentrations of chloroform that exceeds the current chloroform criterion of 0.19 ug/liter. The commenter indicated that this more stringent value makes it practically impossible for facilities to use or treat municipal water and meet the standard. The commenter indicated support for adoption of USEPA's recommended value of 5.7 ug/liter.

We appreciate the commenters concerns. We note that while only one facility has come forward to express problems meeting the current chloroform value, we believe that by revising the number as proposed, other potential compliance problems may be avoided.

3. One commenter expressed concern about this revision, citing the carcinogenicity and moderate toxicity of chloroform and indicating that the allowable instream standard is being relaxed by 30 times by the Board's action. The commenter also indicated that the revision appears to be being proposed based on the need expressed by only a single discharger, and suggested that other alternatives may be available to address individual problems rather than revising the standard statewide. The commenter further noted that there is no federal prohibition against states promulgating water quality standards more stringent than federal standards. Finally, the commenter expressed disappointment in the Board and the State in often erring on the side of lowest common denominator safeguards in developing and enforcing environmental protections.

The Board acknowledges the concerns offered by the commenter and understands that the issues raised reflect important considerations with regard to ensuring the protection of the state's waters and the public health. In response to the concerns raised, however, the Board believes the proposed chloroform value to be protective of human health. Specifically, the number adopted is the value that has been recommended by USEPA since 1992, and has been developed according to the protocol established by that agency for deriving human health criteria. With regard to the carcinogenic effects of chloroform, the value of 5.7 ug/liter was calculated by USEPA based on a 10^{-6} cancer risk factor; which means that at this concentration, there is a risk of one case of cancer in a population of one million people. This cancer risk factor has been adopted in all human health numeric criteria promulgated in this rule. The proposed value therefore provides the same level of protection against cancer effects as the other carcinogenic criteria in these standards.

The Board is concerned about the commenters expression of disappointment, and their characterization of the Board's actions as providing only minimal protection to the state's waters. We would like to reiterate that our proposed action results in establishing a criterion for chloroform consistent with the value developed and recommended by the US Environmental Protection Agency. We disagree that the Board's actions provide only minimal protection, and we encourage the commenter to provide more detail about this concern. We believe that the proposed value offers proper safeguards for the people of the state and is based on a sound scientific rationale. We feel strongly that our deliberation process provides generous opportunities for discussions on matters such as this, and we hope that the commenter will continue to take advantage of these opportunities to clarify the concerns raised in this instance.

Board Action

The Board adopts the revision as proposed.