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

Form #3 ◘

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2003 AUG -1 P 4:00

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 Governing Water 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.

Stephanie R. Timmermeyer

Authorized Signature

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: August 1, 2003

TO: LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

FROM:(*Agency Name, Address & Phone No.*) WV Environmental Quality Board
1615 Washington Street, E.
Suite 301
Charleston, WV 25311-2126
(304) 558-4002

LEGISLATIVE RULE TITLE: "Requirements Governing Water Quality Standards"

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

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

   May 23, 2003

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

   Published in the Charleston Gazette on May 30, 2003.

   Published in the Charleston Daily Mail on June 10,2003.

   The WV Department of Environmental Protection provided a press release on June 5, 2003.

   Distributed to the Notice to our internal e-mail mailing list of approximately 175 people.

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

   Public Hearing - June 18, 2003. Written comments - June 23, 2003

   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)

August 1, 2003

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 25311-2126

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
August 1, 2003

Summary of Proposed Changes

Section 46-1-2 – Definitions. Updated definitions reflecting reorganization of WV Department of Environmental Protection; updated reference to Code of Federal Regulations (CFR).

Section 46 – 4. Antidegradation Policy.
Clerical revisions

Section 46-1-5. Mixing Zones.
§ 5.2.b. – clarified applicable alternatives in USEPA's Technical Support Document for use in developing zones of initial dilution;
§ 5.2.k. – Expanded documentation of mixing zone compliance with all provisions of section 5.2.b – 5.2.g. and section 5.2.h.2; a few clerical revisions throughout the section.

Section 46-1-6. Water Use Categories
Deleted references to appendices which are proposed for removal.
§ 6.6. – revised for consistency with other designated use categories.

Section 46-1-7. West Virginia Waters
§ 7.1. Deleted sections 7.1.a. – 7.1.e. which outline the Major River Basins and their Alphanumeric System. Retained the reference to "Key to West Virginia Stream Systems and Major Tributaries (1956), which is the source for the deleted language.

§7.2.a.2. Revised Weirton Steel Corporation's exemption from the "1/2 mile rule" by limiting the application of the exemption to only the Category A criterion for iron; extending it to March 1, 2010, with a reporting requirement in 2007; and outlining monitoring and reporting requirements.

§7.2.b. Revised this exemption section to allow for applications for "natural background" exemptions to apply to trout waters. Note that before such exemption is granted, an application must be filed and approved by the Board, and is subject to notice and comment requirements of the state Administrative Procedures Act.

§7.2.c.5. This natural background exemption from dissolved oxygen for the upper Blackwater River is proposed to be moved to section 7.2.d.9.1; with minor clerical revisions.

§7.2.d.14.1. Historic removal of use categories A (public water supply) and E (water supply industrial) from tributaries of the Youghiogheny River in West Virginia which flow into Maryland, are proposed to be reinstated to those tributaries.

§7.2.d.16.2. The variance from numeric criteria on Harmon Creek is revised, based on requests from Weirton Steel Corporation, to delete the alternate criterion for zinc – which will cause the statewide criteria for zinc to be in place. Section revised to update the effective date and to remove some reporting requirements.

§7.2.d.19. Added a description of Kanawha River main stem, zone one.

§7.2.d.20. Added a description for Kanawha River, zone two.

§7.2.d.19.3. Site-specific criteria for chloride proposed on Ward Hollow of Davis Creek, based on request from Union Carbide Corporation. The proposed alternate value for Category A and Category B1 is 310 mg/liter. The statewide criterion for chloride for Category A is 250 mg/l; for Category B1 – chronic is 230 mg/liter.

Section 46-1-8. Specific Water Quality Criteria
Clerical corrections and updates to existing references.

Section 46-1-9. Establishment of Safe Concentration Values
Clerical corrections and updates to existing references.

Appendix A List of Category B-2 – Trout Waters.
List updated to add streams recommended by the WV Division of Natural Resources.

Appendix B – List of Category A Waters
Added a sentence to provide a reference to any additional waters identified by the WV Bureau for Public Health as public water supplies.

Appendix C – List of Category E-3 Power Production Waters
Appendix deleted.

Appendix D – List of Category C – Water Contact Recreation Waters
Appendix deleted.

Appendix E, Table 1
Numeric criteria in table updated and revised to correspond to USEPA's National Recommended Water Quality Criteria: 2002. **See attached tables for specific revisions.**

Appendix E, Table 2
Conversion factors for mercury added to this table.

*Additional general typographical corrections and revisions are made throughout the rule

46 CSR 1
Requirements Governing Water Quality Standards
August 1, 2003

Statement of Circumstances Requiring Proposed Amendments

The federal Clean Water Act requires states to review their Water Quality Standards every three years. The last triennial review of the standards (46 CSR 1 – "Requirements Governing Water Quality Standards") was completed by the Environmental Quality Board in 2000 and the resulting revisions were submitted for consideration in the 2001 legislative session. The revisions proposed herein are the results of the triennial review conducted by the Board pursuant to this federal requirement.

APPENDIX B

FISCAL NOTE FOR PROPOSED RULES

Rule Title: Requirements Governing Water Quality Standards

Type of Rule: X Legislative ____ Interpretive ____ Procedural

Agency: WV Environmental Quality Board

Address: 1615 Washington Street, E.

Charleston, WV 25311

(304)558-4002

1. Effect of Proposed rule:

N/A

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

2. Explanation of Above Estimates:

This type of information is not available for the revisions proposed.

3. Objectives of These Rules:

Establish standards and numeric criteria for the protection of the waters of the state consistent with the federal Clean Water Act.

Rule Title: Requirements Governing Water Qualtiy Standards

4. Explanation of Overall Economic Impact of Proposed Rule:

   A. Economic Impact on State Government:
   SEE ATTACHMENT

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

   C. Economic Impact on Citizens/Public at Large.
   SEE ATTACHMENT

Date: August 1, 2003

Signature of Agency Head or Authorized Representative:

Technical Advisor

Attachment - Responses to Fiscal Note Questions 4.A, 4.B, and 4C.

4.A. Economic Impact on State Government:

These proposed amendments may result in revisions to NPDES permits as they are renewed as well as other changes as the standards are implemented in state regulatory programs. Costs of these changes to the WVDEP and other implementing agencies are not known at this time.

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

Revisions to numeric criteria may result in the need for adjustments to limits in NPDES permits as they are renewed. Some could result in more stringent permit limits; others might relax existing limits - costs to the permittees could change, accordingly. These revisions may also affect requirements and numeric limits established in other regulatory programs. The specific costs of these changes are not known at this time. Note that on two streams, variances from numeric criteria are proposed which provide relief to discharges and are anticipated to lower costs of meeting permit limits.

4.C. Specific economic impacts are unable to be quantified specifically. However, it is anticipated that these updates will result in maintaining, and improving where necessary, the quality of the states's streams and rivers, which will benefit all citizens. Updating the criteria will also ensure protection of the designated uses of state waters such as aquatic life, recreation and public water supply. Maintaining clean water will avoid potential future clean-up costs and will enhance interests such as the tourism industry, which are important to the state economy.

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OFFICE WEST VIRGINIA
SECRETARY OF STATE

TITLE 46
LEGISLATIVE RULE
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~~ state standing or flowing over the surface of the ~~State~~ state. It is declared to be the public policy of the ~~State~~ 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. "Board" is the Environmental Quality Board.

~~2.2. "Chief" is the Chief of the Office of Water Resources of the West Virginia Division of Environmental Protection.~~

~~2.3.~~ 2.2. "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.

~~2.4.~~ 2.3. "Cumulative" means a pollutant which increases in concentration in an organism by successive additions at different times or in different ways (bio-accumulation).

~~2.5.~~ 2.4. "Designated uses" are those uses specified in water quality standards for each state water ~~body~~ or segment whether or not they are being attained. (See ~~sections~~ §§ 6.2 - 6.6, herein)

~~2.6.~~ 2.5. "Director" is the ~~Director of the West Virginia Division of Environmental Protection~~. Director of the Division of Water and Waste Management of the West Virginia Department of Environmental Protection.

~~2.7.~~ 2.6. "Dissolved metal" is operationally defined as that portion of metal which passes through a 0.45 micron filter.

~~2.8.~~ 2.7. "Existing uses" are those uses actually attained in a state water ~~body~~ on or after November 28, 1975, whether or not they are included in the water quality standards.

~~2.9.~~ 2.8. The "Federal Act" means the Clean Water Act (also known as the Federal Water Pollution Control Act) 33 U.S.C. § 1251 - 1387.

~~2.10.~~ 2.9. "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.

~~2.11.~~ 2.10. "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 or pools for a continuous period of at least six (6) months.

~~2.12.~~ 2.11. "Outstanding national resource waters" are those waters whose unique character, ecological or recreational value or pristine nature constitutes a valuable national or ~~State~~ state resource.

~~2.13.~~ 2.12. "Natural" or "naturally occurring" values or "natural temperature" shall mean for all of the waters of the state:

~~2.13.a.~~ 2.12.a. Those water quality values which exist unaffected by -- or unaffected as a consequence of -- any water use by any person; and

~~2.13.b.~~ 2.12.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.

~~2.14.~~ 2.13. "Non-point source" shall mean any source other than a point source from which pollutants may reach the waters of the state.

~~2.15.~~ 2.14. "Persistent" shall mean a pollutant and its transformation products which under natural conditions degrade slowly in an aquatic environment.

~~2.16.~~ 2.15. "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.

~~2.17.~~ 2.16. "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.

~~2.18.~~ 2.17. The "State Act" or "State Law" shall mean the West Virginia Water Pollution Control Act, W. Va. Code §22-11-1.

2.18. "Secretary" is the Secretary of the Department of Environmental Protection.

2.19. "Total recoverable" refers to the digestion procedure for certain heavy metals as referenced in 40 C.F.R. 136, as amended ~~June 15, 1990~~ July 1, 2002, Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act.

2.20. "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.

2.21. "Waters 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.

2.22. "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.

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

2.24. "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.

2.25. "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~~ 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~~ 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~~ state waters 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~~ Secretary 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~~ Secretary 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 2.10~~ §2.9 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 60 C.S.R.

5, Appendix A. 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~~ 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~~ state.

Additional waters may be nominated for inclusion in ~~that~~ this 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~~ Director 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~~ Director 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~~ Director 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~~ C, 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~~ Director. 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~~ Director, the size of the zone shall be determined using ~~one of the four alternatives~~ alternatives 2 through 4 outlined in ~~section~~ §4.3.3 of the US Environmental Protection Agency's (USEPA) 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~~ C, Table 1 shall not be allowed at any point unless a mixing zone has been assigned by

the ~~Chief~~ Director 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~~ Director 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 cubic feet per second (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 state 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 Federal 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 water~~course~~ 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 one-half (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 Federal Act shall constitute compliance with all provisions of this section.

5.2.j. The ~~Chief~~ Director 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~~ Director that the mixing zone is in compliance with the provisions outlined in subsections 5.2.b, 5.2.c, 5.2.d, 5.2.e, 5.2.f, 5.2.g 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~~ Director 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~~ state. Unless otherwise designated by these rules, at a minimum all waters of the ~~State~~ 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 state 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 state 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 state 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~~ 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 USEPA. 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~~ waters. -- As defined in ~~section~~ §2.20, herein (See Appendix A for a representative list.)

6.3.c. Category B4 -- Wetlands. -- As defined in ~~section~~ §2.24, herein; certain numeric stream criteria may not be appropriate for application to wetlands (see Appendix ~~E~~ C, 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 streams and stream segments used for 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~~ transport. -- This category includes all stream segments modified for water transport and having permanently maintained navigation aides.

6.6.b. Category E2 -- Cooling ~~Water~~ 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~~ Director 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 September 1, 2004, 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.~~

Until September 1, 2010, or until action by the Environmental Quality Board to revise this provision, whichever comes first, the one-half (1/2) 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 for the Category A criterion for iron as set forth in §8 herein. Weirton Steel Corporation shall conduct monthly monitoring of the treated water at its drinking water plant for iron and submit the results of such monitoring to the West Virginia Bureau for Public Health and the Division of Water and Waste Management of the West Virginia Department of Environmental Protection. In addition, Weirton Steel Corporation shall submit a written report regarding the status of its drinking water plant and the issues pertaining thereto to the Environmental Quality Board on or before March 1, 2007.

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~~ §7.2.c.4 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~~ 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~~ C, 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 any 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~~ 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 Basin - (Reserved)

7.2.d.2. Potomac River Basin

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 Basin

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 US 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 (5 ~~ug/l~~ ug/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~~ ug/L and manganese: 5 ~~mg/l~~ 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.9.1. Except that in the upper Blackwater River from the mouth of Yellow Creek to a point 5.1 miles upstream, when flow is less than 7Q10, the naturally occurring values for dissolved oxygen as established by data collected by the dischargers within this reach and reviewed by the Board and Department of Environmental Protection shall be the applicable criteria.

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 - (Reserved)

~~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/l~~ ug/L; and iron not to exceed 3.5 ~~mg/l~~ mg/L as a monthly average and 7 ~~mg/l~~ mg/L 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~~ Water Use Category A designation, and which shall have the following instream criteria: Lead 14 ~~ug/l~~ 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~~ mg/L, Monthly Average and 8.0 ~~mg/l~~ 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,~~ Weirton Steel Corporation shall continue to submit to the Division of Water and Waste Management of the West Virginia Department of Environmental Protection, on an 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~~ previous year 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~~ July 1, 2007, 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, from mile point 0, at its confluence with the Ohio River, to mile point 72 near Diamond, West Virginia

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.19.3. Except that in Ward Hollow of Davis Creek, the following site-specific numeric criterion for chloride shall apply for Category A and Category B1 (chronic aquatic life protection): 310,000 ug/L

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

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/l~~ ug/L and copper not to exceed 105 ~~ug/l~~ ug/L as a daily maximum nor 49 ~~ug/l~~ ug/L 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 - (Reserved)

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~~ C, Table 1.

8.1.a. Specific state (i.e. total, total recoverable, dissolved, valence, etc.) of any parameter to be analyzed shall follow 40 C.F.R. 136, Guidelines Establishing Test Procedures for Analysis of Pollutants Under the Clean Water Act, as amended, ~~June 15, 1990~~ July 1, 2002. (See also 47 C.S.R. 10, ~~section~~ §7.3 - National Pollutant Discharge Elimination System (NPDES) Program and 47 C.S.R. 30, §7.2. - WV/NPDES Rules for Coal Mining Facilities.)

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~~ C, Table 2 shall be converted to a dissolved concentration by multiplying each numerical value or criterion equation from Appendix ~~E~~ C, Table 1 by the appropriate conversion factor (CF) from Appendix ~~E~~ C, 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~~ USEPA document "The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion," USEPA 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)~~ Director to develop a site-specific translator consistent with the provisions in this section. The ~~OWR~~ Director 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~~ C, Table 1 shall represent the applicable criteria.

8.1.d. Charts of water quality criteria in Appendix ~~E~~ C, Table 1 shall be applied in accordance with ~~major stream and use applications~~ water use categories and West Virginia waters, outlined in ~~sections~~ §6 and §7, ~~herein~~ respectively.

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~~ C, 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~~ 6.1.b.1 - 6.1.b.6 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 C.S.R. 6 shall be followed.

8.4. Site-specific numeric criteria. The Board may establish numeric criteria different from those set forth in Appendix ~~E~~ C , 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 USEPA'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 C.S.R. 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~~ state, the use of which has been designated a Category B1, B2, ~~B3~~ or B4, such discharge may be regulated by the ~~Chief~~ Director where necessary to protect ~~State~~ 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~~ Director 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 5 value. Except where the ~~Chief~~ Director 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~~ Director and shall submit all of the following in writing to the ~~Chief~~ Director:

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~~ Director.

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: USEPA Office of Research and Development Series Publication, "Methods for Measuring the Acute Toxicity" (USEPA/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~~ (EPA-600-4-91-002), July 1994; 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~~ Director.

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 2.20.

River Basin	County	Stream
James River		
J-1-A	Mercer	Ewin Run
J-3	Monroe	Cove Creek
J-1-C	Monroe	North Fork of Potts Creek
J-1-E	Monroe	South Fork Potts Creek
Potomac River		
P-5	"Berkeley	Hartland Run
P-4-J	"Berkeley	Middle Creek (Above Route 30 Bridge)
P-4-M	"Berkeley	Mill Creek
P-6-B	"Berkeley	Mill Run
P-4	Berkeley	Opequon Creek
P-6-A	"Berkeley	Tillance Creek
P-4-C	"Berkeley	Tuscarora Creek (Above Martinsburg)
P-3	"Jefferson	Rocky Marsh Run
P-No Code	Jefferson	Town Run
P-9-B	Morgan	Meadow Branch
S-9-A	Hardy	Capon Run
~~PS~~-6	"Jefferson	Big Bullskin Run
~~PS~~-2	"Jefferson	Cattail Run
~~PS~~-4	"Jefferson	Evitt's Run
~~PS~~-1	Jefferson	Flowing Springs Run (Above Halltown)
~~PS~~-7	"Jefferson	Long Marsh Run
PC-9	Hampshire	Cold Stream
PC-11	"Hampshire	Dillons Run
PC-10	"Hampshire	Edwards Run ~~and Impoundment~~ (upstream of pond)
PC-17	Hampshire	Hawk Run of Cacapon
PC-24-E-1	"Hardy	Camp Branch
PC-24	Hardy	Lost River
PC-24-H	"Hardy	Lower Cove Run of Lost River
PC-20	"Hardy	Moores Run
PC-7	"Hardy	North River (Above Rio)
PC(L)-23-A-1-(1)	"Hardy	Rock Cliff Lake (Impoundment)
PC(L)-23-A-1-(2)	"Hardy	Trout Pond (Impoundment)
PC-23	"Hardy	Trout Run of Cacapon
PC-19	"Hardy	Waites Run
PC(L)-20-(1)	"Hardy	Warden Lake (Impoundment)
PSB-28-A-1	Grant	Big Run of Jordan Run
PSB-28-E	Grant	High Ridge Run of North Fork

PSB-28-A-2	Grant	Laurel Run of Jordan
PSB-26-E	Grant	North Fork Lunice Creek
PSB-29	Grant	Redman Run
PSB-28-B	Grant	Samuel Run of North Fork
PSB-25-C-2	"Grant	Spring Run of South Mill Creek
PSB-26-D	"Grant	South Fork Lunice Creek
PSB-25-C	"Grant	South Mill Creek (Above Hiser)
PSB-28	Grant-Pendleton	North Fork South Branch
PSB	Grant- "Pendleton	South Branch (Above North Fork)
PSB-9	Hampshire	Mill Creek
PSB-13	"Hampshire	Mill Run of South Branch
PSB-21-F	Hardy	Dumpling ~~Creek~~ Run
PSB-28-EE-2-A	Pendleton	Back Run of Sawmill Branch
PSB-28-EE	"Pendleton	Big Run of North Fork
PSB-28-R	Pendleton	Blizzard Run
PSB-28-S	Pendleton	Brier Gap Run
PSB-32	Pendleton	Briggs Run of South Branch
PSB-28-C	Pendleton	Broad Run of North Fork
PSB-28-K-1	Pendleton	Brushy Run of Seneca Creek
PSB-28-EE-4	Pendleton	Elk Run of Big Run
PSB(L)-21-X-(1)	Pendleton	Hawes Run (Impoundment)
PSB-28-K-3	Pendleton	Horsecamp Run of Seneca Creek
PSB-28-G	"Pendleton	Laurel Fork of North Fork - to VA line
PSB-28-T	Pendleton	Laurel Run of North Fork
PSB-21-GG	"Pendleton	Little Fork
PSB-28-GG-2-A	Pendleton	Little Low Place Hollow of Laurel Fork
PSB-28-K-2-B	Pendleton	Long Run of Roaring Creek
PSB-28-I	Pendleton	Powdermill Run of North
PSB-33	Pendleton	Reeds Creek
PSB-28-K-2	Pendleton	Roaring Creek of Seneca Creek
PSB-21-K	Pendleton	Rough Run of South Branch
PSB-28-GG-1	Pendleton	Sams Run of Laurel Fork
PSB-28-EE-2	Pendleton	Sawmill Branch of Big Run
PSB-28-K	"Pendleton	~~Senera~~ Seneca Creek
PSB-28-K-4	Pendleton	Strader Run of Seneca Creek
PSB-47	Pendleton	Thorn Creek
PSB-28-K-6-No Code	Pendleton	Upper Gulf Run of Whites Run
PSB-28-GG-2	Pendleton	Vance Run of Laurel Fork
PSB-28-K-3-B	Pendleton	Wamsley Run
PSB-28-K-6	Pendleton	Whites Run of Seneca Creek
PSB-28-I-1	Pendleton	Wilson Run of Kettle Creek
PNB-18	Grant	Difficult Run of North Branch
PNB-17	Grant	Stony River Upstream of Mount Storm Lake
PNB-No Code	Grant	Wilsonia Run of North Branch
PNB-16-B	Grant	Wycroff Run of Abrams Creek
PNB-4-EE	Grant-Mineral	North Fork of Patterson Creek
PNB-15-A	Mineral	Cranberry Run of Deep Creek Run
PNB-15	Mineral	Deep Run of North Branch
PNB(L)-4-C-2-(1)	"Mineral	Fort Ashby (Impoundment)
PNB-14	Mineral	Howell Run of North Branch
PNB-4-S	"Mineral	Mill Creek (Above Markwood)
PNB-7	"Mineral	New Creek
PNB(L)-7-H-(1)	"Mineral	New Creek Dam 14 (Impoundment)

PNB-4-EE	Mineral	North Fork Patterson Creek
PNB	Pendleton	North Branch of Potomac
PNB-16-B-No Code	Grant	Johnnycake Run of Wycroff Run
Ohio River		
O-98-A	Hancock	North Fork of Kings Creek
O-88-D-2	Ohio	Middle Wheeling Creek
Monongahela River		
M-16	Monongalia-Marion	Whiteday Creek (Above Smithtown)
MC-2-B	"Monongalia	Blaney Hollow
MC(L)-6-(1)	"Monongalia	Coopers Rock (Impoundment)
MC-2	Monongalia	Morgan Run
MC-51-No Code	Pocahontas	Oats Run of Shavers Fork
MC-12	Preston	Big Sandy
MC-33	"Preston	Buffalo Creek
MC-12-B-5	Preston	Cherry Run of Little Sandy
MC-20	"Preston	Elsey Run
MC-33-A	Preston	Flag Run of Buffalo Creek
MC-12-A	Preston	Laurel Run of Big Sandy
MC-12-B	Preston	Little Sandy
MC-12-B-6	Preston	Mill Run of Little Sandy
MC-17	Preston	Muddy Creek
MC-12-B-No Code	Preston	Piney Run of Little Sandy
~~MT~~ MC-18	Preston	Roaring Creek (Above Little Lick Branch)
MC-32	Preston	Saltlick Creek
MC-36	Preston	Wolf Creek
MC-41	Preston-Tucker	Long Run
MC-54-K	Preston-Tucker	Twelvemile Run of Clover
MC-60-K-6	Randolph	Baker Camp Run
MC-60-T-8	Randolph	Big Run of Gandy
MC-60-T-No Code	Randolph	Big Run of Gandy (above the sinks)
MC-60-O-1	Randolph	Big Run of Red Creek
MC-60-N-10	Randolph	Camp Five Run
MC-60-K-15	Randolph	Daniels Creek
MC-60-T-No Code	Randolph	Devers Run of Gandy
MC-60	"Randolph	Dry Fork (Above Otter Creek)
MC-60-K-17	"Randolph	East Fork Glady Fork (Above C & P Compressor Station)
MC-60-K-4	Randolph	Five Lick
MC-60-O-2	Randolph	Flatrock Run
MC-60-T	"Randolph	Gandy Creek ~~(Above Whitmer)~~
MC-60-K	"Randolph	Glady Fork
MC-60-T-9	Randolph	Grants Branch
MC-60-Q	Randolph	Horsecamp Run
MC-60-N	"Randolph	Laurel Fork
MC-60-T-1	Randolph	Lower Two Spring
MC-60-K-11	Randolph	McCray Creek
MC-60-T-10	Randolph	Narrow Ridge Run
MC-60-K-2	Randolph	Panther Camp Run
MC(L)-60-T-10-(1)	"Randolph	Spruce Knob Lake (Impoundment)
MC-60-P	Randolph	Spruce Run

MC-60-T-3	Randolph	Swallow Rock
MC-60-T-6	Randolph	Taylor Run
MC-60-K-1	"Randolph	Three Spring Run
MC-60-R	Randolph	Tory Camp Run
MC-60-T-2	Randolph	Upper Two Spring
MC-60-T-11	Randolph	Warner Run
MC-60-K-16	Randolph	West Fork of Glady - exclude lower 2 miles
MC-60-K-5	Randolph	Woodford Run
MC-59	Randolph-Pocahontas	Shavers Fork (Above Little Black Fork)
MC-33-A-1-No Code	Tucker	Aarons Run of Pheasant Run
MC-60-L	Tucker	Big Run of Dry Fork
MC-60-D	"Tucker	Blackwater River (Above Davis)
MC-60-D	"Tucker	Blackwater River (Below Davis downstream to mouth of North Fork) ~~(insert date adopted)~~
MC-No Code	Tucker	Canoe Run
MC-51	Tucker	Clover Run
MC-55	Tucker	Dry Run
MC-60-C	"Tucker	Elklick Run of Black Fork
MC-60-J	Tucker	Elklick Run of Dry Fork
MC-60-O-3	Tucker	Gandy Run of Red Creek
MC-54-D	Tucker	Hile Run of Horseshoe Run
MC-54	"Tucker	Horseshoe Run
MC-51-B	Tucker	Indian Run
MC-54-I	Tucker	Leadmine Run of Horseshoe Run
MC-51-C	Tucker	Left Fork of Clover Run
MC-54-E	Tucker	Lick Drain
MC-54-C	"Tucker	Maxwell Run of Horseshoe
MC-54-A	Tucker	Mike Run of Horseshoe
MC-56	Tucker	Mill Run of Cheat River
MC-60-I	Tucker	Mill Run of Dry Fork
MC-51-C-No Code	Tucker	Mill Run of Left Fork of Clover
MC-52	Tucker	Minear Run of Cheat
MC-60-0	"Tucker	Red Creek
MC-60-G	Tucker	Red Run
MC-46-B	Tucker	Right Fork of Bull Run
MC-51-A	Tucker	Right Fork of Clover Run
MC-60-D-10	Tucker	Sand Run
MC-56-No Code	"Tucker	Slip Hill Mill Branch
MC(L)-60-D-3-(1)	"Tucker	Thomas Park (Impoundment)
MC-54-H	Tucker	Thunderstruck Run of Horseshoe
MC-45	Tucker	Tobes Run
MC	Tucker	Two Spring Run of Glady Fork
MC-51-D	Tucker	Valley Fork
MC-57	Tucker	Wolf Run of Cheat River
MC-60-D-11	Tucker	Yoakum Run
MC-54	Tucker-Preston	Horseshoe Run (Headwaters) to Leadmine
MCS-55	Pocahontas	Second Fork
MCS-54	Randolph	Beaver Creek
MCS-57	Randolph	Black Run
MCS-47	Randolph	Blister Run
MCS-14	Randolph	Clifton Run
MCS-50	Randolph	First Fork
MCS-48	Randolph	Fish Hatchery Run

MCS-33	Randolph	Fishing Hawk
MCS-43	Randolph	Glade Run
MCS-16	Randolph	Johns Run
MCS-49	Randolph	Lambert Run
MCS-13	Randolph	Little Black Fork
MCS-12	Randolph	Little Laurel Run
MCS-9	Randolph	Nail Run
MCS-15	Randolph	Rattlesnake Run
MCS-46	Randolph	Red Run of Shavers Fork
MCS-22-A	Randolph	Stalnaker Run
MCS-22	Randolph	Taylor Run
MCS-40	Randolph	Whitmeadow Run
MCS-40	Randolph	Yokum Run
MCS-4	Tucker	Jobs Run
MCS-5	Tucker	Laurel Run of Shavers Fork
MCS-3-A	Tucker	South Branch of Haddix Run
MCS-7	Tucker	Stonelick Run
MW(L)-13-I-2.5-(1)	Harrison	Dog Run (Pond)
MW(L)-38-(1)	Lewis	Stonecoal Lake
MT-23-C	Barbour	Brushy Fork (Above Valley Furnace)
MT-23-F	"Barbour	Mill Run of Teter Creek
MT-23-H	Barbour	Mill Run of Teter Creek
MT(L)-23-(1)	"Barbour	Teter Creek Lake (Impoundment)
MT-38	Barbour	Zebs Creek
MT-12-No Code	Preston	Boyds Run
MT-12-No Code	Preston	Fields Creek
MT-18-E-5-B	Preston	Frog Run
MT-12-D	Preston-Taylor-Monongalia	Laurel Run of Threeforks
MT-66-C	Randolph	Back Fork of Riffle Creek
MT-47	Randolph	Beaver Creek
MT-68	Randolph	Becky Creek from secondary Rt 56 bridge upstream
MT-68-A	Randolph	Big Branch of Becky Creek
MT-81	"Randolph	Big Run of Tygart
MT-73	Randolph	Clay Run
MT-77	Randolph	Conley Run
MT-74	"Randolph	Elkwater Fork above Mowry Run
MT-50	Randolph	Files Creek (Rt. FK-MT-50-A) from compressor station upstream
MT-64-C	Randolph	Glade Run
MT-72	Randolph	Hamilton
MT-50-B	Randolph	Left Fork of Files Creek
MT-50-A-1	Randolph	Limekiln Run
MT-74-B	Randolph	Limekiln Run of Elkwater
MT-80	Randolph	Logan Run
MT-44	Randolph	Mathais Run
MT-66-B	Randolph	McGee Run
MT-64-E	Randolph	Meatbox Run
MT-33	Randolph	Middle Form (Upper) above Cassity
MT-64	Randolph	Mill Creek upstream at end of Co. Rt. 46/4
MT-50-No Code	Randolph	Millstone Run Right Fork of Files Creek
MT-74-A	Randolph	Mowry Run
MT-64-F	Randolph	Potatohole Fork

MT-67	Randolph	Rafe Run
MT-78	Randolph	Ralston Run
MT-66	Randolph	Riffle Creek - above McGee Run
MT-45-C	Randolph	Right Fork of Chenoweth Creek
MT-61	Randolph	Shavers Run
MT-75	Randolph	Stewart Run
MT	Randolph	Tygart River (Above Huttonsville)
MT-79	Randolph	Windy Run
MT(T)-27-(1)	Taylor-Barbour	Tygart Lake Tailwaters (Above Route 119 Bridge)
MTB-32-H	Randolph	Beech Run
MTB-31-I	Randolph	Devil Fork
MTB-31-C	Upshur	Alec Run
MTB-28	Upshur	Big Run of Buckhannon - about DLM drain
MTB	Upshur	Buckhannon River (Above Beans Mill)
MTB-18	Upshur	French Creek
MTB-32-E	Upshur	Lick Run
MTB-31-D	Upshur	Millsite Run
MTB-27	Upshur	Panther Fork (headwaters) - from 2 miles above Co. Rt. 32
MTB-31-B	Upshur	Reger Run
MTB-25-A	Upshur	Right Fork of Tenmile Creek - except lower ½ mile
MTB-32-D	Upshur-Randolph	Bearcamp Run
MTB-32	Upshur-Randolph	Left Fork Buckhannon
MTB-31-F	Upshur-Randolph	Left Fork Right Fork
MTB-31	Upshur-Randolph-Lewis	Right Fork Buckhannon River
MTM-26	Randolph	Birch Fork of Middle Fork
MTM-16	Randolph	Cassity Fork (Upper) - above Mulberry Run
MTM-28	Randolph	Kittle Run
MTM-23	Randolph	Laurel Branch
MTM-22	Randolph	Laurel Run of Middle Fork
MTM-13	Randolph	Long Run
MTM	Randolph	Middle Fork River (Above Cassity)
MTM-27	Randolph	Mitchell Lick Fork
MTM-16-A	Randolph	Panther Run of Cassity Fork (Upper) except lower 1/4 mile
MTM-21	Randolph	Pleasants Run
MTM-26-No Code	Randolph	Rocky Run of Birch Fork
MTM-25	Randolph	Schoolcraft Run
MTM-24-A	Randolph	Spice Run
MTM-24	Randolph	Sugar Run
MTM-11-E	Upshur	Jenks Fork
~~MTN~~ MTM-11	Upshur	Right Fork Middle Fork River
MTM-11-D	Upshur-Randolph	Jackson Fork
MY-5	Preston	Maple Run
MY-4	Preston	Rhine Creek
MY-2	Preston	Snowy Creek
MY	Preston	Youghiogheny River

Little Kanawha River

LK-131	Upshur	Getout Run
LK-115-H	Upshur	Left Fork-Right Fork (Little Kanawha River)
LK	Upshur-Lewis	Little Kanawha River (Above Wildcat)

Kanawha River

K-80	Fayette	Falls Creek
K-76	Fayette	Loop Creek
KC-47	Raleigh	Clear Fork
KE-102-A	Braxton	Camp Creek (Centralia)
KE(T)-43-(1)	"Braxton	Sutton Lake Tailwaters (Above Route 38/5 Bridge)
KE(L)-43-(1)	Braxton	Sutton Reservoir
KE-91	Braxton	Wolf Creek (Centralia)
KE-43	Clay	Blue Knob Creek
KE-69	Clay	Groves Creek
KE-50-I	Clay	Rockcamp Run
KE-74	Clay	Strange Creek
KE-76-O	Nicholas	Poplar Creek
KE-76-L-.5	Nicholas	Tug Fork
KE-135	Pocahontas	Big Run of Elk
KE-138	Pocahontas	Big Spring Fork
KE-139-B	Pocahontas	Crooked Fork
KE-138-B	Pocahontas	Cup Run
KE-133	Pocahontas	Dry Branch
KE-127-No Code	Pocahontas	Hawthorne Run of Jeffery Run of Big Spring Fork
KE-137	Pocahontas	Laurel Run of Elk
KE-136	Pocahontas	Props Run
KE-139-.5A	Pocahontas	Slaty Fork
KE-130	Randolph	Chimney Rock Run
KE-129	Randolph	Valley Fork
KE-117-B	Randolph-Webster	Right Fork of Leatherwood
KE-111	Webster	Back Fork of Elk
KE-127	Webster	Big Run of Elk
KE-98-B-16	"Webster	Desert Fork (Headwaters) above Roaring Run
KE	"Webster	Elk River (Above Webster Springs)
KE-98-C-14	"Webster	Fall Run
KE-102	Webster	Laurel Creek (Erbacon)
KE-98-C-11	"Webster	Laurel Fork of Left Fork of Holly
KE-98-C	"Webster	Left Fork Holly River
KE-111-K-2	Webster	Little Sugar Creek
KE-111-K	"Webster	Sugar Creek (Headwaters) above Little Sugar
KE-118	Webster-Randolph	Bergoo Creek
KC-31-B	Boone	Hopkins Fork
KC-46	"Raleigh	Marsh Fork (Above Sundial)

KC(L)-46-Q-(1)	Raleigh	Stephens Lake (Impoundment)
KG-19-J	Fayette	Brackens Creek
KG-19-A	Fayette	Dogwood Creek
KG	Fayette	Glade Creek
KG-6	Fayette	Rich Creek
KG-19-No Code	Fayette	Surbaugh Creek
KG-34-H-14	Greenbrier	Bear Run
KG-34-G-8	Greenbrier	Becky Run
KG-34-E-8	Greenbrier	Beech Run
KG-19-U	Greenbrier	Big Clear Creek
KG-34-G-13	Greenbrier	Big Run of South Fork of Cherry
KG-34-G-2	Greenbrier	Briery Run
KG-19-U-1	Greenbrier	Brown Creek
KG-34-H-5	Greenbrier	Coats Run
KG-34-G-10	Greenbrier	Cold Knob Fork
KG-34-E-13	Greenbrier	Cold Spring Branch
KG-34-G-5	Greenbrier	Elklick Run
KG-34-E-9	Greenbrier	Hogcamp Run
KG-34-F-2	Greenbrier	Improvement Branch
KG-19-U-2-D	Greenbrier	Job Knob Branch
KG-19-V-7	Greenbrier	Kuhn Branch
KG-19-V	"Greenbrier	Little Clear Creek ~~and Laurel Run~~
KG-19-V-5	Greenbrier	Laurel Run
KG-19-P	"Greenbrier	Meadow Creek
KG-34-E-11	Greenbrier	Middle Branch
KG-19-U-2-C	Greenbrier	Old Field Branch
KG-34-G-6	Greenbrier	Rocky Run
KG-19-U-3	Greenbrier	Sam Creek
KG-34-G	Greenbrier	South Fork of Cherry(Headwaters) downstream to Rocky Run
KG(L)-34-H-5-(1)	Greenbrier	Summit Lake (Impoundment)
KG-24	Greenbrier-Nicholas	Hominey Creek
KG-34-E	Greenbrier-Nicholas	Laurel Creek
KG-34-H	Greenbrier-Nicholas	North Fork Cherry River
KG-34-G	Greenbrier-Nicholas	South Fork Cherry River
KG-19-G	"Nicholas	Anglins Creek (Headwaters) - 41/9 bridge upstream
KG-26-K	Nicholas	Brushy Creek
KG-24-E-2	Nicholas	Brushy Meadow Creek
KG-34	Nicholas	Cherry River
KG-20	Nicholas	Collison Creek
KG-32-J	Nicholas	Cranenest Run
KG-24-B	Nicholas	Deer Creek
KG-24-E	Nicholas	Grassy Creek
KG-24	Nicholas	Hominy Creek
KG-32	Nicholas	Panther Creek
KG-13	Nicholas	Peters Creek
KG-24-J	Nicholas	Price Fork
KG-K-(L)-82-(1)	Nicholas	Summersville Reservoir (Impoundment)
KG-K-(T)-82-(1)	"Nicholas	Summersville Tailwaters (Above Collison Creek)
KG34-F	Nicholas-Greenbrier	Little Laurel Creek
KG-34-H-4	Nicholas-Randolph	Hunters Run
KG-34-H-No Code	Pocahontas	Darnell Run of North Fork of Cherry

KG-72	Randolph-Pocahontas	Middle Fork of Gauley
KG-73	Randolph-Pocahontas	North Fork of Gauley
KG	Randolph-Webster	Gauley River (Above Moust Coal Tipple)
KG-45	Webster	Big Laurel Fork
KG-59	Webster	Big Run of Gauley
KG-70	Webster	Big Run of Gauley
KG	Webster	Gauley River (Headwaters) above Jerryville
KG-61	Webster	Hughes Run
KG-58	Webster	Laurel Creek of Gauley
KG-57	Webster	Miller Mill Run
KG-60-No Code	Webster	Right Fork of Turkey Creek of Gauley
KG-67	Webster	Straight Creek of Gauley
KG-60	Webster	Turkey Creek
KG-65	Webster	Williams Camp Run
KGC-3	Nicholas	Jakeman Run
KGC-4-A	Nicholas	Little Barrenshe
KGC-4	Pocahontas	Barrenshe Run
KGC-24	Pocahontas	North Fork of Cranberry (Only the C&R Area)
KGC-23	Pocahontas	South Fork Cranberry River
KGC	Pocahontas-Webster-Nicholas	Cranberry River
KGC-19	Randolph	Dogway Fork
KGC-9	Webster	Aldrich Run
KGC-8	Webster	Foxtree Run
KGC-15	Webster	Hanging Rock Branch
KGC-7	Webster-Nicholas	Bee Run
KGW-26	Pocahontas	Black Mountain Run
KGW-25	Pocahontas	Day Run
KGW-20-A	Pocahontas	Lick Creek
KGW-22	Pocahontas	Little Laurel Creek
KGW-27	Pocahontas	Mountain Lick Run
KGW-21	Pocahontas	Sugar Creek
KGW-20	Pocahontas	Tea Creek
KGW-10	"Pocahontas-Webster	Middle Fork of Williams
KGW	Pocahontas-Webster	Williams River ~~(Above Dyer)~~
KGW-1	Webster	Craig Run
KGW-2	Webster	Jonathan Run
KGW-9	Webster	Lick Branch
KGW-3	Webster	Sawyer Run
KGW-4	Webster	Spice Run
KGW-8	Webster	White Oak Fork
KN-23	Fayette	Buffalo Creek
KN-27-C	Fayette	Chestnut Knob Fork of Laurel
KN-22	Fayette	Dunloup Creek ~~(Downstream from Harvey Sewage Treatment Plant)~~
KN-17-A	Fayette	Glade Creek of Manns
KN-27	"Fayette	Laurel Creek ~~(Above Cotton Hill)~~ of New River
KN-7	Fayette	Mill Creek
~~KG~~ KN-10	Fayette	Wolf Creek
KN-60	Mercer	East River (Above Kelleysville)
KN-60-B	"Mercer	Pigeon Creek

KN-51-I	Monroe	Laurel Creek
KN-61	Monroe	Rich Creek
KN-51-O	"Monroe	Turkey Creek
KN-26-F	Raleigh	Beaver Creek
KN-26-B	Raleigh	Fat Creek
KN-29	Raleigh	Glade Creek of New River
KN-29-E	Raleigh	Pinch Creek
KN-26	Raleigh	Piney Creek
KN-32	Summers	Meadow Creek
KNB-30	Mercer	Crane Creek
KNB-12-B	Mercer	Laurel Creek (Bluestone)
KNB-3	Summers	Little Bluestone
KNG-28	"Greenbrier	Anthony Creek (Above Big Draft)
KNG(S)-3-A	Greenbrier	Burns Run
KNG(S)-3	Greenbrier	Culverson Creek
KNG(S)-2-B	Greenbrier	Flynn Creek
KNG(S)-2-A	Greenbrier	Hughart Creek
KNG(S)-1	"Greenbrier	Milligan Creek
KNG-28-Q	Greenbrier	North Fork Anthony Creek
KNG-(S)-3-C-1	Greenbrier	Roaring Creek
KNG-30	"Greenbrier	Spring Creek
KNG-28-Q-2	Greenbrier	Twomile Run
KNG-23	Greenbrier-Monroe	Second Creek (Rt. 219 Bridge to Nickell's Mill)
KNG-23-H	Monroe	Kitchen Creek (Above Gap Mills)
KNG-78-L	"Pocahontas	Abes Run
KNG-53-G	Pocahontas	Barclay Run
KNG-47	"Pocahontas	Beaver Creek
KNG-68-A-5	Pocahontas	Black Run
KNG(L)-78-C-1-(1)	"Pocahontas	Buffalo Fork (Impoundment)
KNG-79-C-2	Pocahontas	Club House Run
KNG-68	"Pocahontas	Deer Creek
KNG-53-H	Pocahontas	Douthat Creek
KNG-78	Pocahontas	East Fork of Greenbrier
KNG-68-A-6	Pocahontas	Elleber Run
KNG-79-B	Pocahontas	Fill Run
KNG-78-G	"Pocahontas	Five Mile Run
KNG	"Pocahontas	Greenbrier River (Above Hosterman)
KNG-68-A-6	Pocahontas	Griffin Run
KNG(S)-4	"Pocahontas	Hills Creek
KNG-78-A	Pocahontas	Johns Run
KNG-53	"Pocahontas	Knapp's Creek
KNG-60	Pocahontas	Laurel Run of Greenbrier
KNG-70	Pocahontas	Leatherbark Run
KNG-78-C	"Pocahontas	Little River-East Fork (Head)downstream to Buffalo Fork
KNG-79-C	"Pocahontas	Little River-West Fork (Head) first low water bridge
KNG-38	Pocahontas	Locust Creek
KNG-78-H-1	Pocahontas	Long Run
KNG-78-K	"Pocahontas	Mullenax Run
KNG-68-A	"Pocahontas	North Fork Deer Creek ~~(Above Route 28/5)~~ FS bridge below Sutton Run

KNG-78-H	Pocahontas	Poca Run
KNG-23-C	Pocahontas	Red Run of South Fork of Cranberry
KNG(L)-59-D-(1)	"Pocahontas	Seneca (Impoundment)
KNG-66-D	Pocahontas	Shock Run
KNG-66	"Pocahontas	Sitlington Creek
KNG-79-C-1	Pocahontas	Spanoak
KNG-55	"Pocahontas	Stoney Creek
KNG-68-A-3	Pocahontas	Sutton Run of North Fork of Deer Creek
KNG-49	"Pocahontas	Swago Creek
KNG-68-A-4	Pocahontas	Tacker Fork
KNG-59	Pocahontas	Thorny Creek
KNG-74	Pocahontas	Trout Run of Greenbrier
KNG(L)-43-(1)	Pocahontas	Watoga Lake
KNG-79	"Pocahontas	West Fork Greenbrier ~~(Above the impoundment at the tannery)~~
No Code	Randolph	White Run of East Fork of Glady
KNB-13	"Mercer	Camp Creek
KNB-13-D	Mercer	Marsh Fork
OG-124	Wyoming	Pinnacle Creek ~~creek~~

Tug Fork of Big Sandy River

BST-70	McDowell	Dry Fork ~~(Above Canebrake)~~ of Tug
BST-99	McDowell	Elkhorn Creek
BST-70-W	McDowell	Jacob Fork

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, or any additional waters identified by the West Virginia Bureau for Public Health as public water supplies:

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 Districk 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	meron 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	Kanawha River & Gum Hollow
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. Stickney	Coal River
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 River
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~~	~~Ohio River~~	~~Brooke/Cabell/ Hancock/Jackson/ Marshall/Mason/ Ohio/Pleasants/ Tyler/Wayne/ Wood/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 = 1.2(total ammonia-N) / $1+10^{(pka-pH)}$ where pka = 0.0902 + 2730/(273.2 + T) and T = temperature (^{o}C) The concentration of un-ionized ammonia (NH3) shall not exceed 50 ug/l.		—		—		50	
8.2.1 Acute and chronic aquatic life criteria for ammonia shall be determined using the National Criterion for Ammonia in Fresh Water[a] 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

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]			
8.4.1 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	
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: $Cd = e^{(0.7852[\ln(\text{hardness})]-3.490)} \times CF^5$		X		X			
8.7.4 The one-hour average concentration of dissolved cadmium shall not exceed the value determined by the following equation: $Cd = e^{(1.128[\ln(\text{hardness})]-3.828)} \times CF^5$	X		X				
8.8 Chloride (mg/l) Not to exceed:	860	230	860	230	250	250	

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]			
8.9.1 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[7]: $Cu = e^{(0.8545[\ln(\text{hardness})]-1.465)}$ x CF[5]		X		X			
8.10.2 The one-hour average concentration of dissolved copper shall not exceed the value determined by the following equation[7]: $Cu = e^{(0.9422[\ln(\text{hardness})]-1.464)}$ x 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	

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 Dissolved Oxygen[5]: 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						
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	

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]			
8.13.1 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	-	
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[5] (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[6]: $Pb = e^{(1.273[ln(hardness)]-4.705)} \times CF^{5}$		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]			
8.16.2 The one-hour average concentration of dissolved lead shall not exceed the value determined by the following equation[7]: $Pb = e^{(1.273[ln(hardness)]-1.46)} \times CF^5$	X	–	X	–			
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[7]: $Ni = e^{(0.846[ln(hardness)]+1.1645)} \times CF^5$		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[7]: $Ni = e^{(0.846[ln(hardness)]+3.36)} \times CF$[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[6] (ng/l)	2400	4.3	2400	4.3	0.46	0.46	0.46
DDT[6] (ng/l)	1100	1.0	1100	1.0	0.024	0.024	0.024
Aldrin[6] (ng/l)	3.0		3.0		0.071	0.071	0.071
Dieldrin[6] (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[6] (ng/l)	730	0.2	730	0.2	0.73	0.73	0.73
PCB[6] (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)[6] (pg/l)					0.014	0.013	0.014
Acrylonitrile[6] (ug/l)					0.66	0.059	
Benzene[6] (ug/l)		-			71	0.66	

~~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]~~			
~~1,2-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[5] (ug/l)~~					~~9.1~~	~~0.11~~	
~~Hexachlorobenzene[5] (ng/l)~~					~~0.77~~	~~0.72~~	
~~Carbon tetrachloride[5] (ug/l)~~					~~4.4~~	~~0.25~~	
~~Chloroform[5] (ug/l)~~					~~470~~	~~5.7~~	
~~Halomethanes (ug/l)~~					~~15.7~~	~~0.19~~	
~~1,2-dichloroethane[5] (ug/l)~~					~~99~~	~~0.035~~	
~~1,1,1-trichloroethane[5] (mg/l)~~						~~12~~	
~~1,1,2,2-tetrachloroethane (ug/l)~~					~~11~~	~~0.17~~	
~~1,1-dichloroethylene[5] (ug/l)~~					~~3.2~~	~~0.03~~	
~~Trichloroethylene[5] (ug/l)~~					~~81~~	~~2.7~~	
~~Tetrachloroethylene[5] (ug/l)~~					~~8.85~~	~~0.8~~	
~~Toluene[5] (mg/l)~~					~~200~~	~~6.8~~	
~~Polynuclear Aromatic Hydrocarbons (PAH)[5] (ug/l)~~					~~0.031~~	~~.0028~~	
~~Phthalate esters (ug/l)~~		~~3.0~~		~~3.0~~			

~~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]~~			
~~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~~	
~~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.~~							

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]			
8.23 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
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~~
~~8.26 Selenium (ug/l) Not to exceed:~~	~~20~~	~~5~~	~~20~~	~~5~~		~~10~~	

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]			
8.27 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: $Ag=e^{(1.72[ln(hardness)]-6.52)}$ x CF[5]	X		X				

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		
	B1, B4		B2				
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]	C[3]	A[4]	ALL OTHER USES
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					
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					

~~APPENDIX E, TABLE 1~~

~~PARAMETER~~	~~USE DESIGNATION~~						
	~~AQUATIC LIFE~~				~~HUMAN HEALTH~~		
	~~B1, B4~~		~~B2~~		~~C[3]~~	~~A[4]~~	~~ALL OTHER USES~~
	~~ACUTE[1]~~	~~CHRON[2]~~	~~ACUTE[1]~~	~~CHRON[2]~~			
~~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~~				
~~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):~~ ~~Period Inst.~~ ~~Dates Ave. 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~~						
~~8.29 Thallium (ug/l)~~					~~6.3~~	~~1.7~~	
~~8.30 Threshold odor[5]~~ ~~Not to exceed a threshold odor number of 8 at 104°F as a daily average.~~		~~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]			
8.31 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.							
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	

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]			
8.32.1 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	
8.33 Zinc (ug/l) The four-day average concentration of dissolved zinc shall not exceed the value determined by the following equation[3]: $Zn = e^{(0.8473[ln(hardness)]+0.7614)} \times CF^5$		X		X	X		
8.33.1 The one-hour average concentration of dissolved zinc shall not exceed the value determined by the following equation[3]: $Zn = e^{(0.8473[ln(hardness)]+0.8604)} \times CF^5$	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 C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
1	Acenaphthene	83329					670	990
2	Acrolein	107028					190	290
3	Acrylonitrile [b]	107131					0.051	0.25
4	Aldrin [b]	309002	3.0		3.0		0.000049	0.000050
5	Aluminum (dissolved)	7429905	750xCF[5]	87xCF[5]	750xCF[5]	87xCF[5]		
6	Ammonia: 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).	7664417	X	X	X	X		
7	Anthracene	120127					8,300	40,000

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
8	Antimony	7440360					5.6	640
9.a	Arsenic [b]	7440382					50	50
9.b	Arsenic (dissolved)		340 X CF[5]	150 X CF[5]	340 X CF[5]	150 X CF[5]		
10	Asbestos	1332214					7 million fibers/l	
11	Barium	7440393					1000	
12	Benzene [b]	71432					2.2	51
13	Benzidine [b]	92875					0.000086	0.00020
14	Benzo(a)Anthracene [b]	56553					0.0038	0.018
15	Benzo(a)Pyrene [b]	50328					0.0038	0.018
16	Benzo(b)Fluoranthene [b]	205992					0.0038	0.018
17	Benzo(k)Fluoranthene [b]	207089					0.0038	0.018
18	Beryllium	7440417					4	

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
19	alpha-BHC (alpha-Hexachloro-cyclohexane) [b]	319846					0.0026	0.0049
20	beta-BHC (beta-Hexachloro-cyclohexane) [b]	319857					0.0091	0.017
21	gamma-BHC (gamma-Hexachloro-cyclohexane) (Lindane) [b]	58899	0.95		0.95		0.019	0.063
22	Bis(2-Chloroethyl)Ether [b]	111444					0.030	0.53
23	Bis(2-Chloroisopropyl)Ether	108601					1,400	65,000
24	Bis(2-Ethylhexyl) Phthalate [b]	117817					1.2	2.2
25	Bromoform [b]	75252					4.3	140
26	Butylbenzyl Phthalate	85687					1,500	1,900

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
27.a	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	7440439					X	
27.b	Cadmium (dissolved)	7440439	2.0[a,e]	0.25 [a,e]	2.0[a,e]	0.25 [a,e]		
28	Carbon Tetrachloride [b]	56235					0.23	1.6
29	Chlordane [b]	57749	2.4	0.0043	2.4	0.0043	0.00080	0.00081
30	Chloride	16887006	860,000	230,000	860,000	230,000		
31.a	Chlorine: (Total Residual Chlorine - measured by amperometric or equivalent method)	7782505	19	11				

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
31.b	Chlorine: Total Residual Chlorine: No chlorinated discharge allowed	7782505			X	X		
32	Chlorobenzene	108907					680	21,000
33	Chlorodibromomethane [b]	124481					0.40	13
34	Chloroform [b]	67663					5.7	470
35	2-Chloronaphthalene	91587					1,000	1,600
36	2-Chlorophenol	95578					81	150
37	Chlorophenoxy Herbicide (2,4-D)	94757					100	
38	Chlorophenoxy Herbicide (2,4,5-TP)	93721					10	
39	Chloropyrifos	2921882	0.083	0.041	0.083	0.041		
40	Chromium III: (dissolved)	16065831	570[a,f]	74[a,f]	570[a,f]	74[a,f]		

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
41.a	Chromium VI (dissolved)	18540299	16 x CF[5]	11 x CF[5]	16 x CF[5]	11 x CF[5]		
41.b	Chromium VI	18540299					50	
42	Chrysene [b]	218019					0.0038	0.018
43.a	Copper	7440508					1300	
43.b	Copper (dissolved)	7440508	13[a,g]	9.0[a,g]	13[a,g]	9.0[a,g]		
44	Cyanide (expressed as µg free cyanide (as CN)/L)	57125	22	5.0	22	5.0	700	220,000
45	4,4'-DDD [b]	72548					0.00031	0.00031
46	4,4'-DDE [b]	72559					0.00022	0.00022
47	4,4'-DDT [b]	50293	1.1[e]	0.001[e]	1.1[e]	0.001[e]	0.00022	0.00022
48	Demeton	8065483		0.1		0.1		
49	Dibenzo(a,h)Anthracene [b]	53703					0.0038	0.018
50	1,2-Dichlorobenzene	95501					2,700	17,000

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
51	1,3-Dichlorobenzene	541731					320	960
52	1,4-Dichlorobenzene	106467					400	2,600
53	3,3'-Dichlorobenzidine [b]	91941					0.021	0.028
54	Dichlorobromomethane [b]	75274					0.55	17
55	1,2-Dichloroethane [b]	107062					0.38	37
56	1,1-Dichloroethylene [b]	75354					0.057	3.2
57	2,4-Dichlorophenol	120832					77	290
58	1,2-Dichloropropane [b]	78875					0.50	15
59	1,3-Dichloropropene	542756					10	1,700
60	Dieldrin [b]	60571	0.24	0.056	0.24	0.056	0.000052	0.000054
61	Diethyl Phthalate	84662					17,000	44,000
62	2,4-Dimethylphenol	105679					380	850
63	Dimethyl Phthalate	131113					270,000	1,100,000

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
64	Di-n-Butyl Phthalate	84742					2,000	4,500
65	2,4-Dinitrophenol	51285					69	5,300
66	Dinitrophenols	25550587					69	5300
67	2,4-Dinitrotoluene [b]	121142					0.11	3.4
68	1,2-Diphenylhydrazine [b]	122667					0.036	0.20
69	alpha-Endosulfan	959988	0.22[p]	0.056[p]	0.22[p]	0.056[p]	62	89
70	beta-Endosulfan	33213659	0.22[p]	0.056[p]	0.22[p]	0.056[p]	62	89
71	Endosulfan Sulfate	1031078					62	89
72	Endrin	72208	0.086	0.036	0.086	0.036	0.76	0.81
73	Endrin Aldehyde	7421934					0.29	0.30
74	Ether, Bis(Chloromethyl)[b]	542881					0.00010	0.00029
75	Ethylbenzene	100414					3,100	29,000

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
76.a	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

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
76.b	Fecal Coliform - Ohio River main stem from the Ohio - Pennsylvania - West Virginia state line to the Ohio - Kentucky - West Virginia state line: 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
77	Fluoranthene	206440					130	140
78	Fluorene	86737					1,100	5,300

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
79	Fluoride (2,000 for Category D Use)						1,400	
80	Guthion	86500		0.01		0.01		
81	Heptachlor [b]	76448	0.52	0.0038	0.52	0.0038	0.000079	0.000079
82	Heptachlor Epoxide [b]	1024573	0.52	0.0038	0.52	0.0038	0.000039	0.000039
83	Hexachlorobenzene [b]	118741					0.00028	0.00029
84	Hexachlorobutadiene [b]	87683					0.44	18
85	Hexachlorocyclo-hexane-Technical	319868					0.0123	0.0414
86	Hexachlorocyclo-pentadiene	77474					240	17,000
87	Hexachloroethane [b]	67721					1.4	3.3
88	Ideno(1,2,3-cd)Pyrene [b]	193395					0.0038	0.018
89	Iron [c]	7439896		1500		500	1500	

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1.B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
90	Isophorone [b]	78591					35	960
91.a	Lead	7439921					50	
91.b	Lead (dissolved)	7439921	65[a,h]	2.5[a,h]	65[a,h]	2.5[a,h]		
92	Malathion	121755		0.1		0.1		
93	Manganese (see §6.2.d)						1000	
94.a	Mercury (dissolved)	7439976	1.4 x CF[5]	0.77 x CF[5]	1.4 x CF[5]	0.77 x CF[5]		
94.b	Total mercury in any unfiltered water sample shall not exceed:	7439976					0.14	0.15
94.c	Mercury -total organism body burden of appropriate aquatic species shall not exceed 0.5 ug/g as methyl mercury.						0.5	0.5
95	Methoxychlor	72435		0.03		0.03	100	

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
96	Methyl Bromide	74839					47	1,500
97	Methylene Chloride [b]	75092					4.6	590
98	2-Methyl-4,6-Dinitrophenol	534521					13	280
99	Mirex	2385855		0.001		0.001		
100.a	Nickel	7440020					610	4600
100.b	Nickel (dissolved)	7440020	470[a,i]	52[a,i]	470[a,i]	52[a,i]		
101	Nitrate (as Nitrate-N)	14797558					10,000	
102	Nitrite (as Nitrite-N)		1,000		60.0			
103	Nitrobenzene	98953					17	690
104	Nitrosamines						0.0008	1.24
105	Nitrosodibutylamine, N [b]	924163					0.0063	0.22
106	Nitrosodiethylamine,N [b]	55185					0.0008	1.24

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
107	N-Nitrosodimethylamine [b]	62759					0.00069	3.0
108	N-Nitrosodi-n-Propylamine [b]	621647					0.0050	0.51
109	N-Nitrosodiphenylamine [b]	86306					3.3	6.0
110	Nitrosopyrrolidine,N [b]	930552					0.016	34
111	Odor [c]: Not to exceed a threshold odor number of 8 at 104°F as a daily average			X		X	X	X
112.a	Oxygen - dissolved[c]: not less than 5 mg/l at any time	7782447	X				X	X

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1.B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
112.b	Oxygen - dissolved[c], Kanawha River main stem from mile point 0at its confluence with the Ohio River, to mile point 72 near Diamond, West Virginia: not less than 4.0 mg/l at any time	7782447	X					

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
112.c	Oxygen - dissolved, Ohio River main stem from the Ohio - Pennsylvania - West Virginia state line to the Ohio - Kentucky - West Virginia state line: 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				

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
112.d	Oxygen - dissolved: not less than 7.0 mg/l in spawning areas and in no case less than 6.0 mg/l at any time.				X		
113	Parathion	56382	0.065	0.013	0.065	0.013	
114	Pentachlorobenzene	608935					1.4	1.5
115	Pentachlorophenol [b,j]	87865	19	15	19	15	0.27	3.0
116	pH[e] (Higher values due to photosynthetic activity may be tolerated)		6.0 - 9.0	6.0 - 9.0	6.0 - 9.0	6.0 - 9.0	5.0 - 9.0	6.0 - 9.0
117	Phenol	108952					21,000	1,700,000
118	Polychlorinated Biphenyls (PCBs)[bq]			0.014		0.014	0.000064	0.000064
119	Pyrene	129000					830	4,000

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
120.a	Radionuclides: Alpha particles: 15 picocuries per Liter (pCi/L) Beta particles and photon emitters: 4 millirems per year (mrem/yr) Radium 226 & 228 (combined): 5 pCi/L Uranium: 30 ug/L						X	X

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
120.b	Radionuclides: In the Ohio River main stem from the Ohio - Pennsylvania - West Virginia state line to the Ohio - Kentucky - West Virginia state line: 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 4pCi/l; the concentration of total gross beta particle activity shall not exceed 50 pCi/L; the concentration of total strontium-90 shall not exceed 8 pCi/l.						X	X
121.a	Selenium	7782492					170	4200

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1.B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
121.b	Selenium (dissolved)	7782492	[kl]	5.0[l]	[kl]	5.0[l]		
122	Silver (dissolved)	7440224	3.2[m]		3.2[m]			
123	Sulfide-Hydrogen Sulfide	7783064		2.0		2.0		
124	2,3,7,8 - TCDD (Dioxin)[b]	1746016					5.0E-9	5.1E-9
125.a	Temperature: Temperature rise shall be limited to no more than 5°F above natural temperature, not to exceed 87 °F at any time during the 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		X					

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
	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.						

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1.B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
125.b	Temperature: For the Kanawha River main stem from mile point 0, at its confluence with the Ohio River, to mile point 72 near Diamond, West Virginia: Temperature rise shall be limited to no more than 5°F above natural temperature, not to exceed 90°F in any case.		X					

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
125.c	Temperature: For the Bluestone River, Bluestone Lake, East River, New River, Gauley River, and Greenbrier River: 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			

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
125.d	Temperature: No heated effluents will be discharged in the vicinity of spawning areas. The maximum temperatures for trout waters are expressed in the following table: Daily Mean °F / Hourly Max °F Oct. thru April 50 / 55 Sept. and May 58 / 62 June thru Aug. 66 / 70				X		

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
125.e	Temperature: For Ohio River main stem from the Ohio - Pennsylvania - West Virginia state line to the Ohio - Kentucky - West Virginia state line: Period Instant Dates Ave. 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		X				

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
125.e Cont...	Dates Period Ave. / Instant Max. Sept 16-30 82°F 86°F Oct 1-15 77 82 Oct 16-31 72 77 Nov 1-30 67 72 Dec 1-31 52 57		X				
126	Tetrachlorobenzene,1,2,4,5	95943				0.97	1.1
127	1,1,2,2-Tetrachloroethane [b]	79345				0.17	4.0
128	Tetrachloroethylene [b]	127184				0.69	3.3
129	Thallium	7440280				1.7	6.3
130	Toluene	108883				6,800	200,000
131	Toxaphene [b]	8001352	0.73	0.0002	0.73	0.0002	0.00028	0.00028
132	1,2-Trans-Dichloroethylene	156605				700	140,000
133	Tributyltin (TBT)	----	0.46	0.063	0.46	0.063		

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
134	1,2,4-Trichlorobenzene	120821					260	940
135	1,1,1-Trichloroethane	71556					12,000	
136	1,1,2-Trichloroethane [b]	79005					0.59	16
137	Trichloroethylene [b]	79016					2.5	30
138	2,4,5-Trichlorophenol	95954					1,800	3,600
139	2,4,6-Trichlorophenol [b]	88062					1.4	2.4

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
140.a	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.							

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
140.b	Turbidity: 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

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
140.c	Turbidity: This rule shall not apply to those activities at which Best Management Practices in accordance with the State's adopted Nonpoint Source Management Plan are being utilized, maintained and completed on a site-specific basis or at which an approved Federal or State Surface Mining Permit is in effect. This exemption shall not apply to Trout Waters.		X			X	X
141	Vinyl Chloride [b]	75014				2.0	530
142.a	Zinc (dissolved)	7440666	120[n]	120[n]	120[n]	120[n]	

Note: All units ug/L unless otherwise specified.

APPENDIX C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
142.b	Zinc	7440666					7,400	26,000

End Notes:

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 C, Table 2.
a Hardness as calcium carbonate (mg/l). The minimum hardness allowed for use in 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 present 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).
e The aquatic life criteria for cadmium are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Chronic=$\exp^{(0.7409[\ln(\text{hardness})]-4.719)}$ X CF[5] ; Acute=$\exp^{(1.0166[\ln(\text{hardness})]-3.942)}$ X CF[5]

f The aquatic life criteria for chromium III are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Acute=exp $^{(0.8190[\ln(\text{hardness})]+3.7256)}$ X CF^5; Chronic= exp $^{(0.8190[\ln(\text{hardness})]+0.6848)}$ X CF^5.

g The aquatic life criteria for copper are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Chronic=exp $^{(0.8545[\ln(\text{hardness})]-1.702)}$ X CF^5; Acute=exp $^{(0.9422[\ln(\text{hardness})]-1.700)}$ X CF^5.

h The aquatic life criteria for lead are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Chronic=exp $^{(1.273[\ln(\text{hardness})]-4.705)}$ X CF^5; Acute= exp $^{(1.273[\ln(\text{hardness})]-1.460)}$ X CF^5.

i The aquatic life criteria for nickel are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Chronic=exp $^{(0.8460[\ln(\text{hardness})]+0.0584)}$ X CF^5; Acute=exp $^{(0.8460[\ln(\text{hardness})]+2.255)}$ X CF^5.

j Aquatic life values for pentachlorophenol are expressed as a function of pH and are calculated as follows: Acute =exp(1.005(pH)-4.869); Chronic=exp(1.005(pH)-5.134). Values displayed in the table correspond to a pH of 7.8.

k The acute criterion for selenium = 1/[(f1/CMC1) + (f2/CMC2)] where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 µg/L and 12.82 µg/L, respectively.

l This recommended water quality criterion for selenium is expressed in terms of total recoverable metal in the water column. It is scientifically acceptable to use the conversion factor 0.996 that was used in the Great Lakes Initiative to convert this to a value that is expressed in terms of dissolved metal.

m The aquatic life criterion for silver is expressed as a function of hardness (mg/l) in the water column. The value given here corresponds to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Acute=exp $^{(1.72[\ln(\text{hardness})]-6.59)}$ X CF^5.

n The aquatic life criteria for zinc are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Chronic=exp $^{(0.8473[\ln(\text{hardness})]+0.884)}$ X CF^5; Acute=exp $^{(0.8473[\ln(\text{hardness})]+0.884)}$ X CF^5.

o This criterion applies to DDT and its metabolites (i.e., the total concentration of DDT and its metabolites should not exceed this value).

p This value was derived from data for endosulfan and is most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.

q This criterion applies to total pcbs, (e.g., the sum of all congener or all isomer or homolog or Aloclor analyses).

APPENDIX C
TABLE 2

Conversion Factors

Metal	Acute	Chronic
Aluminum	1.000	1.000
Arsenic	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-[(1n hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]
Mercury	0.85	0.85
Nickel	0.998	0.997
Selenium	0.996	0.922
Silver	0.85	N/A
Zinc	0.978	0.986

APPENDIX ~~E~~ C COMPARISON CHART

The purpose of the attached comparison chart is to allow readers to easily identify the changes made to **46 C.S.R. 1, Appendix E, Table 1**. Please note that because of the deletion of other appendices in the rule, Appendix E, Table 1 is now referred to as **Appendix C, Table 1**. This table may be reviewed in concert with the "Responses to Comments and Explanations of Proposed Amendments" document which has been included with this filing.

USING THE TABLE

1.) The first column of the table represents either the number where the parameter appears in the current rule (stricken) or where it appears in the proposed rule (underlined).

2.) The second column lists the actual parameters. All new parameters and corresponding numeric criteria are underlined. In cases where the Board has proposed a change to a parameter that exist in the current rule, the parameter and criteria are stricken. Then that parameter is again listed in the next row immediately below, with the parameter and criteria underlined to reflect how it will appear in the proposed rule.

3.) Some parameters have been deleted by the Board and do not appear in the proposed rule. These parameters appear as strike-throughs in the comparison chart.

FORMATTING CHANGES

The Board has reformatted Appendix C, Table 1, in order to more closely mirror the format used in the US Environmental Protection Agency's (USEPA) "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047, November 2002)

1.) The layout of Appendix C, Table 1 has changed. The header column labeled "ALL OTHER USES" has been deleted and unless specifically addressed those criteria have been removed from the table.

2.) Inthe current rule the Human Health columns are listed in order of "C" and "A". These columns have been reversed in the proposed rule. Now, the Human Health "A" column appears to the left of the Human Health "C" column.

3.) The proposed table now includes the Chemical Abstracts Service (CAS) registry numbers which provide a unique identification for each chemical.

4.) All of the parameters have been renumbered and are now listed in alphabetical order within the table reorganization. This includes all of the organic parameters listed in section 8.22 of the table and all phenolic materials listed in section 8.24 of the current rule table. All of these parameters are now listed in alphabetical order throughout the table.

5.) In the current rule many of the parameters are expressed as milligrams per liter (mg/L). However, in the new proposed rule, unless otherwise noted in the table, all parameters are expressed in micrograms per liter (ug/L). For many of the parameters, changing the numeric value to different units of measure (i.e. mg/L to ug/L) is the only changed proposed.

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1.B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
1	Acenaphthene	83329					670	990
2	Acrolein	107028					190	290
~~8.22~~	~~Acrylonitrile[b] (ug/l)~~						~~0.059~~	~~0.66~~
3	Acrylonitrile [b]	107131					0.051	0.25
~~8.22~~	~~Aldrin[b] (ng/l)~~		~~3.0~~		~~3.0~~		~~0.071~~	~~0.071~~
4	Aldrin [b]	309002	3.0		3.0		0.000049	0.000050
~~8.1~~ 5	Aluminum (dissolved)	7429905	750xCF[5]	87xCF[5]	750xCF[5]	87xCF[5]		

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~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~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
6	Ammonia: 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).	7664417	X	X	X	X		
7	Anthracene	120127					8,300	40,000
~~8.3~~	~~Antimony (ug/l) Not to exceed:~~						~~14~~	~~4300~~
8	Antimony	7440360					5.6	640
~~8.4~~ 9.a	Arsenic [b]	7440382					50	50

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~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]~~		
9.b	Arsenic (dissolved)		340 X CF[5]	150 X CF[5]	340 X CF[5]	150 X CF[5]		
10	Asbestos	1332214					7 million fibers/l	
~~8.5~~	~~Barium (mg/l) Not to exceed:~~						~~1.0~~	
11	Barium	7440393					1000	
~~8.22~~	~~Benzene[b] (ug/l)~~						~~0.66~~	~~71~~
12	Benzene [b]	71432					2.2	51
13	Benzidine [b]	92875					0.000086	0.00020
14	Benzo(a)Anthracene [b]	56553					0.0038	0.018
15	Benzo(a)Pyrene [b]	50328					0.0038	0.018
16	Benzo(b)Fluoranthene [b]	205992					0.0038	0.018

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
17	Benzo(k)Fluoranthene [b]	207089					0.0038	0.018
~~8.6~~	~~Beryllium (ug/l)~~		~~130~~		~~130~~		~~.0077~~	
18	Beryllium	7440417					4	
~~8.22~~	~~alpa-BHC (alpha-Hexachloro-cyclohexane)[b] (ug/l)~~						~~.0039~~	~~0.013~~
19	alpha-BHC (alpha-Hexachloro-cyclohexane) [b]	319846					0.0026	0.0049
~~8.22~~	~~beta-BHC(beta-Hexachloro-cyclohexane)[b] (ug/l)~~						~~0.014~~	~~0.046~~
20	beta-BHC (beta-Hexachloro-cyclohexane) [b]	319857					0.0091	0.017
~~8.22~~	~~gamma-BHC (gamma-Hexachloro-cyclohexane)[b] (ug/l)~~		~~2.0~~	~~0.08~~	~~2.0~~	~~0.08~~	~~0.019~~	~~0.063~~

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
21	gamma-BHC (gamma-Hexachloro-cyclohexane) (Lindane) [b]	58899	0.95		0.95		0.019	0.063
22	Bis(2-Chloroethyl)Ether [b]	111444					0.030	0.53
23	Bis(2-Chloroisopropyl)Ether	108601					1,400	65,000
24	Bis(2-Ethylhexyl) Phthalate [b]	117817					1.2	2.2
25	Bromoform [b]	75252					4.3	140
26	Butylbenzyl Phthalate	85687					1,500	1,900
~~8.7~~ 27.a	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	7440439					X	

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~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~~			
27.b	Cadmium (dissolved)	7440439	2.0[a,e]	0.25 [a,e]	2.0[a,e]	0.25 [a,e]		
~~8.22~~	~~Carbon tetrachloride[n] (ug/l)~~					~~0.25~~	~~4.4~~

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
28	Carbon Tetrachloride [b]	56235					0.23	1.6
~~8.22~~	~~Chlordane[b] (ng/l)~~		~~2400~~	~~4.3~~	~~2400~~	~~4.3~~	~~0.46~~	~~0.46~~
29	Chlordane [b]	57749	2.4	0.0043	2.4	0.0043	0.00080	0.00081
~~8.8~~	~~Chloride (mg/l) Not to exceed:~~		~~860~~	~~230~~	~~860~~	~~230~~	~~250~~	~~250~~
30	Chloride	16887006	860,000	230,000	860,000	230,000		
~~8.31~~ 31.a	Chlorine: (Total Residual Chlorine - measured by amperometric or equivalent method)	7782505	19	11				
~~8.31.1~~ 31.b	Chlorine: Total Residual Chlorine: No chlorinated discharge allowed	7782505			X			
~~8.22~~	~~Chlorobenzene (mg/l)~~						~~0.68~~	~~21~~

APPENDIX ~~B~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
32	Chlorobenzene	108907					680	21,000
33	Chlorodibromomethane [b]	124481					0.40	13
~~8.22~~ 34	Chloroform [b]	67663					5.7	470
35	2-Chloronaphthalene	91587					1,000	1,600
~~8.24.2~~	~~2-Chlorophenol (ug/l) Not to exceed:~~						~~120~~	~~400~~
36	2-Chlorophenol	95578					81	150
37	Chlorophenoxy Herbicide (2,4-D)	94757					100	
38	Chlorophenoxy Herbicide (2,4,5-TP)	93721					10	
39	Chloropyrifos	2921882	0.083	0.041	0.083	0.041		
~~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~~	

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
40	Chromium III: (dissolved)	16065831	570[a,f]	74[a,f]	570[a,f]	74[a,f]		
~~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~~		
41.a	Chromium VI (dissolved)	18540299	16 x CF[5]	11 x CF[5]	16 x CF[5]	11 x CF[5]		
41.b	Chromium VI	18540299					50	

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
42	Chrysene [b]	218019					0.0038	0.018
~~8.10~~	~~Copper (ug/l) Not to exceed:~~						~~1000~~	
43.a	Copper	7440508					1300	
~~8.10.1~~	~~The four-day average concentration of dissolved copper shall not exceed the value determined by the following equation[3]: $Cu = e^{(0.8545[ln(hardness)]-1.465)} \times CF$[5]~~			~~X~~		~~X~~		
~~8.10.2~~	~~The one-hour average concentration of dissolved copper shall not exceed the value determined by the following equation[3]: $Cu = e^{(0.9422[ln(hardness)]-1.464)} \times CF$[5]~~		~~X~~		~~X~~			
43.b	Copper (dissolved)	7440508	13[a,g]	9.0[a,g]	13[a,g]	9.0[a,g]		

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.11~~	~~Cyanide (ug/l) (As free cyanide HCN+CN⁻) Not to exceed.~~		~~22~~	~~5.0~~	~~22~~	~~5.0~~	~~5.0~~	~~5.0~~
44	Cyanide (expressed as µg free cyanide (as CN)/L)	57125	22	5.0	22	5.0	700	220,000
45	4,4'-DDD [b]	72548					0.00031	0.00031
46	4,4'-DDE [b]	72559					0.00022	0.00022
~~8.22~~	~~DDT[s] (ng/l)~~		~~1100~~	~~1.0~~	~~1100~~	~~1.0~~	~~0.024~~	~~0.024~~
47	4,4'-DDT [b]	50293	1.1[e]	0.001[e]	1.1[e]	0.001[e]	0.00022	0.00022
48	Demeton	8065483		0.1		0.1		
49	Dibenzo(a,h)Anthracene [b]	53703					0.0038	0.018
~~8.22~~	~~1,2-dichlorobenzene (mg/l)~~						~~2.7~~	~~17~~
50	1,2-Dichlorobenzene	95501					2.700	17.000
~~8.22~~	~~1,3-dichlorobenzene (mg/l)~~						~~0.4~~	~~2.6~~

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
51	1,3-Dichlorobenzene	541731					320	960
~~8.22~~	~~1,4-dichlorobenzene (mg/l)~~						~~0.4~~	~~2.6~~
52	1,4-Dichlorobenzene	106467					400	2,600
53	3,3'-Dichlorobenzidine [b]	91941					0.021	0.028
54	Dichlorobromomethane [b]	75274					0.55	17
~~8.22~~	~~1,2-dichloroethane[b] (ug/l)~~						~~0.035~~	~~99~~
55	1,2-Dichloroethane [b]	107062					0.38	37
~~8.22~~	~~1,1-Dichloroethylene~~						~~0.03~~	~~3.2~~
56	1,1-Dichloroethylene [b]	75354					0.057	3.2
~~8.24.3~~	~~2,4-Dichlorophenol (ug/l) Not to exceed:~~						~~93~~	~~790~~
57	2,4-Dichlorophenol	120832					77	290
58	1,2-Dichloropropane [b]	78875					0.50	15
59	1,3-Dichloropropene	542756					10	1,700

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.22~~	~~Dieldrin[b] (ng/l)~~		~~2500~~	~~1.9~~	~~2500~~	~~1.9~~	~~0.071~~	~~0.071~~
60	Dieldrin [b]	60571	0.24	0.056	0.24	0.056	0.000052	0.000054
61	Diethyl Phthalate	84662					17,000	44,000
~~8.24.4~~	~~2,4-Dimethylphenol (ug/l) Not to exceed:~~						~~540~~	~~2300~~
62	2,4-Dimethylphenol	105679					380	850
63	Dimethyl Phthalate	131113					270,000	1,100,000
64	Di-n-Butyl Phthalate	84742					2,000	4,500
~~8.24.5~~	~~2,4-Dinitrophenol (ug/l) Not to exceed:~~						~~70~~	~~14,000~~
65	2,4-Dinitrophenol	51285					69	5,300
66	Dinitrophenols	25550587					69	5300
~~8.22~~	~~2,4 dinitrotoluene[b] (ug/l)~~						~~0.11~~	~~9.1~~
67	2,4-Dinitrotoluene [b]	121142					0.11	3.4
68	1,2-Diphenylhydrazine [b]	122667					0.036	0.20

APPENDIX ~~E~~ C TABLE 1

PARAMETER		CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
69	alpha-Endosulfan	959988	0.22[P]	0.056[P]	0.22[P]	0.056[P]	62	89
70	beta-Endosulfan	33213659	0.22[P]	0.056[P]	0.22[P]	0.056[P]	62	89
71	Endosulfan Sulfate	1031078					62	89
~~8.22~~	~~Endrin (ng/l)~~		~~180~~	~~2.3~~	~~180~~	~~2.3~~	~~2.3~~	~~2.3~~
72	Endrin	72208	0.086	0.036	0.086	0.036	0.76	0.81
73	Endrin Aldehyde	7421934					0.29	0.30
74	Ether, Bis(Chloromethyl)[b]	542881					0.00010	0.00029
~~8.22~~	~~Ethylbenzene (mg/l)~~						~~3.1~~	~~29~~
75	Ethylbenzene	100414					3,100	29,000

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.13~~ 76.a	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

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.13.1~~ 76.b	Fecal Coliform - Ohio River main stem~~(zone one)~~ from the Ohio - Pennsylvania - West Virginia state line to the Ohio - Kentucky - West Virginia state line: 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
~~8.22~~	~~Fluoranthene (ug/l)~~						~~300~~	~~370~~
77	Fluoranthene	206440					130	140
78	Fluorene	86737					1,100	5,300
~~8.14~~	~~Fluoride (mg/l) Not to exceed:~~						~~1.4~~	

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.14.1~~	~~Not to exceed 2.0 for category D uses:~~						
79	Fluoride (2,000 for Category D Use)					1,400	
80	Guthion	86500		0.01		0.01		
~~8.22~~	~~Halomethanes (ug/l)~~					~~0.19~~	~~15.7~~
~~8.22~~	~~Heptachlor[b] (ng/l)~~		~~520~~	~~3.8~~	~~520~~	~~3.8~~	~~0.21~~	~~0.21~~
81	Heptachlor [b]	76448	0.52	0.0038	0.52	0.0038	0.000079	0.000079
82	Heptachlor Epoxide [b]	1024573	0.52	0.0038	0.52	0.0038	0.000039	0.000039
~~8.22~~	~~Hexachlorobenzene[b] (ng/l)~~						~~0.72~~	~~0.77~~
83	Hexachlorobenzene [b]	118741					0.00028	0.00029
84	Hexachlorobutadiene [b]	87683					0.44	18
85	Hexachlorocyclo-hexane-Technical	319868					0.0123	0.0414
86	Hexachlorocyclo-pentadiene	77474					240	17,000

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
87	Hexachloroethane [b]	67721					1.4	3.3
88	Ideno(1,2,3-cd)Pyrene [b]	193395					0.0038	0.018
~~8.15~~	~~Iron[c] (mg/l) Not to exceed:~~			~~1.5~~		~~0.5~~	~~1.5~~	
89	Iron [c]	7439896		1500		500	1500	
90	Isophorone [b]	78591					35	960
~~8.16~~ 91.a	Lead	7439921					50	
~~8.16.1~~	~~The four-day average concentration of dissolved lead shall not exceed the value determined by the following equation[a]: $Pb = e^{(1.273[ln(hardness)]-4.705)} \times CF$[d]~~			~~X~~		~~X~~		
~~8.16.2~~	~~The one-hour average concentration of dissolved lead shall not exceed the value determined by the following equation[a]: $Pb = e^{(1.273[ln(hardness)]-1.46)} \times CF$[d]~~		~~X~~		~~X~~			

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
91.b	Lead (dissolved)	7439921	65[a,h]	2.5[a,h]	65[a,h]	2.5[a,h]		
92	Malathion	121755		0.1		0.1		
~~8.17~~	~~Manganese (mg/l) (see §6.2.d) Not to exceed:~~						~~1.0~~	
93	Manganese (see §6.2.d)						1000	
~~8.18.2~~	~~Methylmercury (water column) Not to exceed (ug/l):~~			~~.012~~		~~.012~~		
94.a	Mercury (dissolved)	7439976	1.4 x CF[5]	0.77 x CF[5]	1.4 x CF[5]	0.77 x CF[5]		
~~8.18.1~~ 94.b	Total mercury in any unfiltered water sample shall not exceed ~~(ug/l)~~:	7439976	~~2.4~~		~~2.4~~		0.14	0.15
~~8.18~~ 94.c	Mercury -total organism body burden of appropriate aquatic species shall not exceed 0.5 ug/g as methyl mercury.						0.5	0.5
~~8.22~~	~~Methoxychlor (ug/l)~~			~~0.03~~		~~0.03~~	~~0.03~~	~~0.03~~
95	Methoxychlor	72435		0.03		0.03	100	

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
96	Methyl Bromide	74839					47	1,500
97	Methylene Chloride [b]	75092					4.6	590
~~8.22~~	~~2-methyl-4,6-Dinitrophenol (ug/l)~~						~~13.4~~	~~765~~
98	2-Methyl-4,6-Dinitrophenol	534521					13	280
99	Mirex	2385855		0.001		0.001		
~~8.19~~	~~Nickel (ug/l) Not to exceed:~~						~~510~~	~~4600~~
~~8.19.1~~	~~The four-day average concentration of dissolved nickel shall not exceed the value determined by the following equation[a]: $Ni = e^{(0.846[ln(hardness)]+1.1645)} \times CF$[5]~~			~~X~~		~~X~~		

APPENDIX ~~B~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.19.2~~	~~The one-hour average concentration of dissolved nickel shall not exceed the value determined by the following equation[x]: $Ni = e^{(0.846[ln(hardness)]+3.361)} \times CF$[5]~~		~~X~~		~~X~~			
100.a	Nickel	7440020					610	4600
100.b	Nickel (dissolved)	7440020	470[a,i]	52[a,i]	470[a,i]	52[a,i]		
~~8.20~~	~~Nitrate (as Nitrate-N) (mg/l)~~						~~10~~	
101	Nitrate (as Nitrate-N)	14797558					10,000	
~~8.21~~	~~Nitrite (as Nitrite-N) (mg/l) Not to exceed:~~		~~1.0~~		~~.060~~			
102	Nitrite (as Nitrite-N)		1,000		60.0			
103	Nitrobenzene	98953					17	690
104	Nitrosamines						0.0008	1.24
105	Nitrosodibutylamine, N [b]	924163					0.0063	0.22

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
106	Nitrosodiethylamine,N [b]	55185					0.0008	1.24
107	N-Nitrosodimethylamine [b]	62759					0.00069	3.0
108	N-Nitrosodi-n-Propylamine [b]	621647					0.0050	0.51
109	N-Nitrosodiphenylamine [b]	86306					3.3	6.0
110	Nitrosopyrrolidine,N [b]	930552					0.016	34
~~8.30~~ 111	~~Threshold~~ Odor [c]: Not to exceed a threshold odor number of 8 at 104°F as a daily average			X		X	X	X
~~8.12~~ 112.a	Oxygen - dissolved[c]: not less than 5 mg/l at any time	7782447	X				X	X

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.12.1~~ 112.b	Oxygen - dissolved[c], Kanawha River main stem, ~~zone one~~ from mile point 0 at its confluence with the Ohio River, to mile point 72 near Diamond, West Virginia: not less than 4.0 mg/l at any time	7782447	X					

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.12.2~~ 112.c	Oxygen - dissolved, Ohio River main stem from the Ohio - Pennsylvania - West Virginia state line to the Ohio - Kentucky - West Virginia state line: 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					
~~8.12.3~~ 112.d	Oxygen - dissolved[c]: not less than 7.0 mg/l in spawning areas and in no case less than 6.0 mg/l at any time.				X			

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
113	Parathion	56382	0.065	0.013	0.065	0.013		
114	Pentachlorobenzene	608935					1.4	1.5
~~8.24.6~~	~~Pentachlorophenol[k] (ug/l)~~						~~0.28~~	~~8.2~~
~~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~~		
115	Pentachlorophenol [b,j]	87865	19	15	19	15	0.27	3.0

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.23~~	~~pH[F] No values below 6.0 nor above 9.0. Higher values due to photosynthetic activity may be tolerated.~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~
116	pH[c] (Higher values due to photosynthetic activity may be tolerated)		6.0 - 9.0	6.0 - 9.0	6.0 - 9.0	6.0 - 9.0	5.0 - 9.0	6.0 - 9.0
~~8.22~~	~~Phthalate esters (ug/l)~~			~~3.0~~		~~3.0~~		
~~8.24.1~~	~~Phenol (ug/l) Not to exceed:~~						~~21,000~~	~~4,600,000~~
117	Phenol	108952					21,000	1,700,000
~~8.22~~	~~PCB[t] (ng/l)~~			~~14.0~~		~~14.0~~	~~0.044~~	~~0.045~~
118	Polychlorinated Biphenyls (PCBs)[bq]			0.014		0.014	0.000064	0.000064
~~8.22~~	~~Polynuclear Aromatic Hydrocarbons (PAH)[t] (ug/l)~~						~~.0028~~	~~0.031~~
119	Pyrene	129000					830	4,000

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~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~~

APPENDIX ~~B~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1.B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~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~~

APPENDIX E C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
120.a	Radionuclides: Alpha particles: 15 picocuries per Liter (pCi/L) Beta particles and photon emitters: 4 millirems per year (mrem/yr) Radium 226 & 228 (combined): 5 pCi/L Uranium: 30 ug/L						X	X

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
120.b	Radionuclides: In the Ohio River main stem from the Ohio - Pennsylvania - West Virginia state line to the Ohio - Kentucky - West Virginia state line: 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 4pCi/l; the concentration of total gross beta particle activity shall not exceed 50 pCi/L; the concentration of total strontium-90 shall not exceed 8 pCi/l.						X	X
~~8.26~~	~~Selenium (ug/l) Not to exceed:~~		~~20~~	~~5~~	~~20~~	~~5~~	~~10~~	
121.a	Selenium	7782492					170	4200

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
121.b	Selenium (dissolved)	7782492	[kl]	5.0[l]	[kl]	5.0[l]		
~~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~~			
122	Silver (dissolved)	7440224	3.2[m]		3.2[m]			

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
123	Sulfide-Hydrogen-Sulfide	7783064		2.0		2.0		
~~8.22~~	~~Dioxin (2,3,7,8- TCDD)[b] (pg/l)~~						~~0.013~~	~~0.014~~
124	2,3,7,8 - TCDD (Dioxin)[b]	1746016					5.0E-9	5.1E-9
~~8.28~~ 125.a	Temperature: Temperature rise shall be limited to no more than 5°F above natural temperature, not to exceed 87 °F at any time during the 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		X					

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
	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.						

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.28.1~~ 125.b	Temperature: For the Kanawha River main stem ~~(K-1)~~ from mile point 0, at its confluence with the Ohio River, to mile point 72 near Diamond, West Virginia: Temperature rise shall be limited to no more than 5°F above natural temperature, not to exceed 90°F in any case.		X					

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1.B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.28.2~~ 125.c	Temperature: For the Bluestone River ~~(KNB)~~, Bluestone Lake ~~(KN-60)~~, East River ~~(KNE)~~, New River ~~(KN)~~, Gauley River ~~(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 C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.28.3~~ 125.d	Temperature: No heated effluents will be discharged in the vicinity of spawning areas. The maximum temperatures for trout waters are expressed in the following table: Daily Mean °F / Hourly Max °F Oct. thru April 50 55 Sept. and May 58 62 June thru Aug. 66 70				X			

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.28.4~~ 125.e	Temperature: For Ohio River main stem ~~(01) (see section 7.1.d, herein)~~: from the Ohio - Pennsylvania - West Virginia state line to the Ohio - Kentucky - West Virginia state line: Period Instant Dates Ave. 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		X					

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
125.e Cont...	Dates Period Ave. / Instant Max. Sept 16-30 82°F 86°F Oct 1-15 77 82 Oct 16-31 72 77 Nov 1-30 67 72 Dec 1-31 52 57		X				
126	Tetrachlorobenzene,1,2,4,5	95943				0.97	1.1
~~8.22~~	~~1,1,2,2-tetrachloroethane (ug/l)~~					~~0.17~~	~~11~~
127	1,1,2,2-Tetrachloroethane [b]	79345				0.17	4.0
~~8.22~~	~~Tetrachloroethylene[b] (ug/l)~~					~~0.8~~	~~8.85~~
128	Tetrachloroethylene [b]	127184				0.69	3.3
~~8.29~~ 129	Thallium ~~(ug/l)~~	7440280				1.7	6.3
~~8.22~~	~~Toluene[b] (mg/l)~~					~~6.8~~	~~200~~
130	Toluene	108883				~~6,800~~	~~200,000~~

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.22~~	~~Toxaphene[b] (mg/l)~~		~~730~~	~~0.2~~	~~730~~	~~0.2~~	~~0.73~~	~~0.73~~
131	Toxaphene[b]	8001352	0.73	0.0002	0.73	0.0002	0.00028	0.00028
132	1,2-Trans-Dichloroethylene	156605					700	140,000
133	Tributyltin (TBT)	----	0.46	0.063	0.46	0.063		
134	1,2,4-Trichlorobenzene	120821					260	940
~~8.22~~	~~1,1,1-trichloroethane[b] (mg/l)~~						~~12~~	
135	1,1,1-Trichloroethane	71556					12,000	
136	1,1,2-Trichloroethane [b]	79005					0.59	16
~~8.22~~	~~Trichloroethylene[b] (ug/l)~~						~~2.7~~	~~81~~
137	Trichloroethylene [b]	79016					2.5	30
138	2,4,5-Trichlorophenol	95954					1,800	3,600
~~8.24.7~~	~~2,4,6-Trichlorophenol[b] (ug/l) Not to exceed:~~						~~2.1~~	~~6.5~~
139	2,4,6-Trichlorophenol [b]	88062					1.4	2.4

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.32~~ 140.a	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~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.32~~ 140.b	Turbidity: 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

APPENDIX ~~E~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.32.1~~ 140.c	Turbidity: This rule shall not apply to those activities at which Best Management Practices in accordance with the State's adopted Nonpoint Source Management Plan are being utilized, maintained and completed on a site-specific basis or at which an approved Federal or State Surface Mining Permit is in effect. This exemption shall not apply to Trout Waters.			X			X	X
~~8.22~~	~~Vinyl chloride[b] (chloroethene) (ug/l)~~						~~2.0~~	~~525~~
141	Vinyl Chloride [b]	75014					2.0	530

APPENDIX ~~E~~ C TABLE 1

PARAMETER	CAS	USE DESIGNATION					
		AQUATIC LIFE				HUMAN HEALTH	
		B1,B4		B2			
		ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~8.33~~	~~Zinc (ug/l) The four-day average concentration of dissolved zinc shall not exceed the value determined by the following equation[7]: $Zn = e^{(0.8473[ln(hardness)]+0.7614)} \times CF$[5]~~			~~X~~		~~X~~		
~~8.33.1~~	~~The one-hour average concentration of dissolved zinc shall not exceed the value determined by the following equation[7]: $Zn = e^{(0.8473[ln(hardness)]+0.8604)} \times CF$[5]~~		~~X~~		~~X~~			
142.a	Zinc (dissolved)	7440666	120[n]	120[n]	120[n]	120[n]		
142.b	Zinc	7440666					7,400	26,000

APPENDIX ~~B~~ C TABLE 1

	PARAMETER	CAS	USE DESIGNATION					
			AQUATIC LIFE				HUMAN HEALTH	
			B1,B4		B2			
			ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	ACUTE[1] (µg/L)	CHRONIC[2] (µg/L)	A[4] (µg/L)	C[3] (µg/L)
~~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.~~							

End Notes:

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 ~~B~~ C, Table 2.
a Hardness as calcium carbonate (mg/l). The minimum hardness allowed for use in 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 present 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).

e The aquatic life criteria for cadmium are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Chronic=$\exp^{(0.7409[\ln(\text{hardness})]-4.719)} \times CF^5$; Acute=$\exp^{(1.0166[\ln(\text{hardness})]-3.942)} \times CF^5$

f The aquatic life criteria for chromium III are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Acute=$\exp^{(0.8190[\ln(\text{hardness})]+3.7256)} \times CF^5$; Chronic= $\exp^{(0.8190[\ln(\text{hardness})]+0.6848)} \times CF^5$.

g The aquatic life criteria for copper are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Chronic=$\exp^{(0.8545[\ln(\text{hardness})]-1.702)} \times CF^5$; Acute=$\exp^{(0.9422[\ln(\text{hardness})]-1.700)} \times CF^5$.

h The aquatic life criteria for lead are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Chronic=$\exp^{(1.273[\ln(\text{hardness})]-4.705)} \times CF^5$; Acute=$\exp^{(1.273[\ln(\text{hardness})]-1.460)} \times CF^5$.

i The aquatic life criteria for nickel are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Chronic=$\exp^{(0.8460[\ln(\text{hardness})]+0.0584)} \times CF^5$; Acute=$\exp^{(0.8460[\ln(\text{hardness})]+2.255)} \times CF^5$.

j Aquatic life values for pentachlorophenol are expressed as a function of pH and are calculated as follows: Acute =exp(1.005(pH)-4.869); Chronic=exp(1.005(pH)-5.134). Values displayed in the table correspond to a pH of 7.8.

k The acute criterion for selenium = 1/[(f1/CMC1) + (f2/CMC2)] where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 µg/L and 12.82 µg/L, respectively.

l This recommended water quality criterion for selenium is expressed in terms of total recoverable metal in the water column. It is scientifically acceptable to use the conversion factor 0.996 that was used in the Great Lakes Initiative to convert this to a value that is expressed in terms of dissolved metal.

m The aquatic life criterion for silver is expressed as a function of hardness (mg/l) in the water column. The value given here corresponds to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Acute=$\exp^{(1.72[\ln(\text{hardness})]-6.59)} \times CF^5$.

n The aquatic life criteria for zinc are expressed as a function of hardness (mg/l) in the water column. The values given here correspond to a hardness of 100 mg/l. Criteria values for other hardness shall be calculated from the following: Chronic=$\exp^{(0.8473[\ln(\text{hardness})]+0.884)} \times CF^5$; Acute=$\exp^{(0.8473[\ln(\text{hardness})]+0.884)} \times CF^5$.

o This criterion applies to DDT and its metabolites (i.e., the total concentration of DDT and its metabolites should not exceed this value).

p This value was derived from data for endosulfan and is most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.

q This criterion applies to total pcbs, (e.g., the sum of all congener or all isomer or homolog or Aloclor analyses).

46 CSR 1
Requirements Governing Water Quality Standards
August 1, 2003

RESPONSES TO COMMENTS AND EXPLANATION OF PROPOSED AMENDMENTS

This document describes the changes proposed in the Water Quality Standards rule. For each proposed change, the following are provided: a description of the existing rule; the amendment proposed by the Board in its May 19, 2003 Notice of Public Hearing; a summary of the comments received on the proposed amendment, the Board's response to the comments (in italicized text) and the final action taken by the Board on the proposed amendment (in italicized text).

Please note that the Board received comments on sections of the rule for which no change was proposed. The Board acknowledges the importance of many of these comments. However, to comply with the WV Administrative Procedures Act, the Board must limit the changes to those which flow from the revisions actually proposed in its Notice of Hearing. The Board will make every effort to address these comments during the next triennial review of the standards, or before, if appropriate.

SECTION 46-1-1 – General. No changes proposed.

SECTION 46-1-2 – Definitions. This section outlines definitions of terms in the rule.

Proposed Changes and Comments Received
General revisions: Updated definitions reflecting reorganization of WV Department of Environmental Protection and references to Code of Federal Regulations (CFR).

- Comments received on typographical and clerical corrections.

§2.4. Revised definition of "designated uses" to read: "those uses specified in water quality standards for each water body or segment whether ~~or not~~ they are being attained."

- Commenter indicated that this revision makes sentence unclear and resulting sentence is inconsistent with language of the federal regulation 40 CSR 131.3.F. Other commenters pointed out grammatical problem as revised.
- Agency commenter suggested revising this definition and others in the rule to by changing the words "water body" to "state water".

§2.19 Revised section to update CFR citation date to July 1, 2001.

- Agency comment suggested correction of date to July 1, 2002.

Board Response. *The Board agrees with the comments regarding deleting the words "or not", and has decided to retain them in all sections where they are proposed to be deleted The Board also agrees that the term "state water" is more consistent with the terms used in the State Water Pollution Control Act at West Virginia Code, § 22-11-3(23), ("water resources", "water" or "waters") than the term "water body" and will revise the rule accordingly where the term "water body" occurs. Also acknowledge and agree with the typographical corrections and the corrected CFR citation date.*

Board Action. *Proposal to delete the words "or not" in section 2.4 withdrawn; all other proposed amendments adopted. Additional revisions, as outlined above in Board Response section, above, also adopted.*

SECTION 46-1-3. Conditions Not Allowable In State Waters. Also called the "narrative criteria" this section outlines environmental conditions not acceptable in state waters.

Proposed Changes and Comments Received

§3.2.d. The Board proposed adding to the prohibition on taste and odor in this section the following language: "USEPA's organoleptic effect criteria may be used when applicable". These federal organoleptic numeric criteria were developed to set limits on certain chemicals that cause unacceptable taste and odor of waters. The Board's proposal was based on the need identified by the WV DEP for more specific criteria for addressing taste and odor impacts in state waters.

- USEPA suggested more specific citation: "National Recommended Water Quality Criteria: 2002" EPA Office of Water, November 2002 (EPA-822-R-02-047).
- Other commenters urged the Board to withdraw this new provision based on USEPA's extremely low numeric values and because there is no implementation guidance offered as to when a permit writer would be required to apply the standards.
- Comment indicated that in most cases the EPA organoleptic criteria are substantially below health-based criteria and adoption would create a significant permitting issue. Commenter attached chart outlining WV criteria and EPA organoleptic values.
- Commenter suggested the Board should not try to incorporate numeric criteria by a reference in the narrative criteria, but should include them separately in Appendix E, where they can be compared to the instream criteria. Suggest careful consideration of which of the organoleptic criteria apply to which uses before adopting them.

Board Response. *The Board acknowledges the concerns raised regarding the stringency of the federally recommended organoleptic criteria. Without additional guidance regarding how and when they are to apply, adopting these criteria could create unanticipated implementation problems. The Board also believes that the WV DEP would be able to use these values in implementing its programs, as appropriate, even if they are not included in the standards.*

Board Action. *Proposed amendment withdrawn.*

SECTION 46 –1-4. Antidegradation Policy. This section outlines the antidegradation policy applicable to state waters.

Proposed Revisions and Comments Received (In addition to the revisions outlined below, several non-substantive, clerical revisions proposed. These are indicated in the text of the rule by strike-throughs and underlines, but because no comments were received on them, they are not specifically addressed in this document.)

§4.1.a. Revised as follows: ". . . . 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."

- Commenters indicated that this revision (removing "or not") makes sentence unclear and resulting sentence is inconsistent with language of the federal regulation 40 CSR 131.3.F.
- WVDEP suggests changing "water body" to "state water".

Board Response. *The Board agrees with the comments regarding deleting the words "or not", and decided to retain them in all sections where they are proposed to be deleted The Board also agrees that the term "state water" is more consistent with the terms used in the State Water Pollution Control Act at West Virginia Code, § 22-11-3(23), ("water resources", "water" or "waters") than the term "water body" and will revise the rule accordingly where the term "water body" occurs.*

Board Action. *Proposal to remove "or not" withdrawn; all other (clerical) revisions adopted; suggestion to change "water body" to "state water" adopted.*

SECTION 46-1-5. Mixing Zones. This section outlines requirements for establishing mixing zones at points of discharge into state waters.

Proposed Revisions and Comments Received

§ 5.2.b. Proposed revisions to clarify applicable alternatives in USEPA's Technical Support Document (TSD) for use in developing zones of initial dilution (ZID).

- Commenter suggested providing the agency more discretion and not mandating the use of the 4 alternatives outlined in the TSD regarding ZIDS. Commenter recommend revising 5.2.b to state that a ZID "may" (rather than "shall") be determined using alternatives 2 – 4 of the TSD"
- Another commenter requested that the original language be retained – need for removal unclear.

Board Response. *The Board retains its support for the WVDEP's position that the first alternative outlined in the TSD, which* ***is not*** *to allow the use of a ZID, is inconsistent with the introductory language in this section which begins "Where a zone of initial dilution* ***is assigned*** *by the Director . . .".*

Board Action. *Proposed amendment adopted.*

§ 5.2.k. Proposal expanded documentation of mixing zone compliance with all provisions of section 5.2.b – 5.2.g. and section 5.2.h.2; a few clerical revisions throughout section.

- No comments received on the revisions to this section
- Additional comments provide on mixing zone sections.

Board Response. *The Board appreciates the comments received on this section. However, most of them go beyond the scope of the revisions proposed and sent to notice. We will make every effort to review these comments during the next review of the standards, and certainly no later than the next triennial review.*

Board Action. *Proposed amendments adopted.*

SECTION 46-1-6. Water Use Categories. This section outlines the designated uses that apply to state waters.

Proposed Revisions and Comments Received

General: Deleted references to appendices which are proposed for removal.

§ 6.6. Proposed revisions to this designated use (Category E – Water supply, industrial, water transport, cooling and power) to make language consistent with other designated use categories.

- No comments received.

Board Action. *Proposed language adopted.*

SECTION 46-1-7. West Virginia Waters

Section 7.1. Major River Basins and their Alphanumeric System. This section outlines the Major River Basins and their Alphanumeric System.

Proposed Revisions and Comments Received

§ 7.1. The Board proposed deleting sections 7.1.a. – 7.1.e. which outline the Major River Basins and their Alphanumeric System. Retained the reference to "Key to West Virginia Stream Systems and Major Tributaries (1956), which is the source for the deleted language. This revision was made based on comments received from the WV DEP identifying a number of inconsistencies in the text of sections 7.1.a – 7.1.c. In addition, that agency indicated that it is currently in the process of developing an alternate stream code system which may be more useful.

- Commenter suggested that because reference to the Key is still in the rule, that the list be retained as a courtesy to the reader.
- WV DEP suggested retaining the reference to Kanawha River Zones 1 and 2 or identifying those zones by footnote where they are used in the rule (7.2.d.19&20 and in Appendix E).

Board Response. *Although the Board acknowledges that retaining the list could be helpful to the reader, the confusion posed by the existing language overrides its value. We look forward to completion of WVDEP's system, and intend to include it in the rule as soon as it is available. The Board agrees with WVDEP's suggestions regarding cleanup of references to the stream codes elsewhere in the rule and agrees to make those changes.*

Board Action. *Proposed revision adopted.*

§7.2. Applicability of Water Quality Standards. This section lists exceptions to the application of the numeric criteria, including variances and designated use removals from specific streams.

§7.2.a.2. This section outlines the half-mile rule, which establishes requirements for discharges within one-half mile above drinking water intakes. Current language provides an exception to that rule for a portion of the Ohio River, affected by a discharge from Weirton Steel Corporation.

Proposed Revisions and Comments Received

Proposed revising Weirton Steel Corporation's exemption from the "1/2 mile rule" by limiting the application of the exemption to only the Category A criterion for iron;

extending it to March 1, 2010, with a reporting requirement in 2007; and outlining monitoring and reporting requirements.

- USEPA commented, indicating among other things: "As with any criteria, when WV submits this revision, it should include a sound scientific rationale documenting how this provision would ensure protection of human health considering the public water supply use."
- Weirton Steel provided comments in support of this proposal noting that the variance from the half-mile rule applies only to iron. The company indicates that discussion with the City of Weirton regarding the use of city water at the mill
- Another commenter indicated that granting exemptions from water uses that provide protection to human and aquatic health are not good practice and suggested a more progressive timetable towards a final solution to Weirton's needs for exemption is overdue.
- Commenter expressed concern about extending the exemption another seven years, indicating that it is nearly the same as providing the "permanent" exemption which was objected to by many citizens, organizations and DEP.
- Two other commenters expressed concern about a long term extension of this exemption.

Board Response. *The Board appreciates the interest expressed in this proposal throughout the review process. While we acknowledge the concerns regarding the 7-year extension of the variance to the half-mile rule provided in this proposal, we believe that the requirement for Weirton to provide a report in 2007 addresses that concern. If the report indicates that revisions to this exception from the half-mile rule are warranted, the Board can take action at that time, rather than waiting until the 2010 end date. Note that nothing in the language provided in this rule would prohibit the Board from revisiting this variance, and possibly revising it, before either the 2007 reporting date or the 2010 ending date. We also believe that by limiting this variance to only one parameter – iron – that the majority of the human health concerns associated with this variance have been addressed.*

Board Action. *Adopted as proposed.*

§7.2.c.4. This section outlines an application process for exemptions from numeric criteria where it is determined that the natural background concentration exceeds the numeric criteria.

Proposed Revisions and Comments Received. The Board proposed revising this section to allow for applications for natural background exemptions to apply to trout waters. This revision was proposed as an alternative to requests to revise the numeric criterion for dissolved oxygen. Those requests were based on compliance concerns in the Blackwater River, which is designated as a trout stream. Upon review, the Board determined that providing an opportunity for an application for a variance from dissolved oxygen for trout waters, which is currently not provided in the rule, would provide a vehicle for possible revision to the criterion on a site specific bases rather than without a broad, state-wide revision (weakening) of the DO criterion.

- USEPA reminded the Board that "before it approves site-specific water quality criteria for a natural condition, WV must find that the natural condition will fully

protect existing and designated uses and ensure the full protection of aquatic life, including trout waters."

- Commenters expressed concern about this provision and urges retention of current language and continuation of requirements that discharges into trout streams meet current statewide criteria.
- A commenter indicated lack of support for the broadening the natural background exemption to allow such exemptions for trout waters.
- Commenters expressed concern about allowing applications for such exemption to apply to trout waters, citing difficulties in proving that a particular condition is actually natural, rather than an anthropogenic impairment. Urged continued exemption from trout waters for consideration of natural background exceptions.

Board Response. *Regarding USEPAs comment, the Board agrees, and notes that section 7.2.c.4 specifically addresses that agency's concern. That section provides: "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". The Board acknowledges the concerns raised in the other comments, but, on balance, finds that allowing the opportunity for application for natural background variances for trout waters is preferable to relaxing the dissolved oxygen criterion statewide. The Board notes that providing an opportunity for an application to be filed does not necessarily mean that the exemption will be granted. The application process in this section is a rigorous one, and is intended to be reviewed carefully and followed strictly. Also worth noting is that trout waters are not exempt from the variance provisions outlined in sections 8.3 and 8.4 of the rule.*
Board Action. *Proposed revision adopted.*

§7.2.c.5. This section outlines a natural background exemption from dissolved oxygen for the upper Blackwater River.

Proposed Revision and Comments Received. This section is proposed to be moved to section 7.2.d.9.1; with minor clerical revisions.

- WVDEP suggested the following revisions: "Except that the upper Blackwater . . .less than 7Q10, the naturally occurring . . .".

Board Response. *The Board agrees with the agency's suggestions.*
Board Action. *Proposed revisions, and the additional revisions proposed by WVDEP adopted.*

§7.2.d.6.1. This section outlines a variance from the temperature criterion on the Stony River. The section states: "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.

Proposed Revisions and Comments Received. No change proposed to this section.

- WVDEP suggested removing this variance because the December 31, 1998 time frame has expired, and a successful 316(a)study has not been completed.

Board Response. *The Board acknowledges the agency's concern and believes that the variance is no longer effective due to the passage of the December 31, 1998 date. However, we also find that the lack of public notice for this revision works against it's*

removal at this time. The Board will ensure that this, and any other variances that include a date which has expired, will be reviewed and addressed at the next appropriate opportunity, with adequate notice for public review and comment
Board Action. *No change proposed.*

§7.2.d.14.1. This section removes designated use categories A (public water supply) and E (water supply industrial) from tributaries of the Youghiogheny River in West Virginia which flow into Maryland.
Proposed Revision and Comments Received. The Board proposed reinstatement of the two designated uses to the streams based on suggestions from WVDEP, who believes these uses were removed in error. These use removals have been included in the rule since at least 1982, and review of the historic record provides no substantive basis for those uses to be removed. It also appears from the record that renumbering of the designated use categories may have been the source of these use redesignations.

- No comments received

Board Action. *Proposed revision adopted.*

§7.2.d.16.2. This section outlines a variance on Harmon Creek for lead, zinc, temperature and iron. This variance is based on socio-economic factors.
Proposed Revisions and Comments Received. The variance from numeric criteria on Harmon Creek is revised, based on requests from Weirton Steel Corporation, to delete the alternative criterion for zinc – which will restore the application of the lower statewide criteria for zinc in the stream. The other variance criteria for lead, temperature and iron are not revised. This section is also revised to update the effective date and to remove some reporting requirements. In support of the continuation of the variance for all but the zinc parameter, the company submitted an updated socio-economic impact report, consistent with USEPA's "Interim Economic Guidance for Water Quality Standards" which supports continuation of the variance.

- US EPA commented positively about the narrowing of parameters in the Harmon Creek variance. However, the agency provided a reminder that the Board must show that the conditions for granting a variance still apply and is consistent with 40 CFR 131.10(g). Variances based on socio-economic factors would have to include a demonstration that those alternative control strategies were evaluated as part of the showing that standards were not attainable.
- Weirton Steel Corporation commented in support of its request for continuation of the variance for lead, iron and temperature. The company provided an updated version of the "Financial and Socio-economic Effects of Compliance with WV Department of Environmental Quality Regulations at Harmon Creek, addressing the company's financial situation since the facility filed for bankruptcy protection on May 19, 2003. The comments indicate that the June 19, 2003 report evidences the further deteriorated financial state of the company.
- WV Highlands indicates narrowing this exemption is a step in the right direction.
- Typographical error – "Management".

Board Response. *The Board acknowledges USEPA's comments regarding alternative control strategies, and believes that the facility has address those sufficiently in its application. The Board notes that EPA received the facility's application in sufficient time to have evaluated that provision sufficiently in the time frame allotted for comments. The Board agrees with commenters indicating that this revision is a step in the right direction – and will continue to encourage narrowing of the variance parameter on Harmon Creek.*
Board Action. *Adopted as proposed, with corrections to typographical errors.*

§7.2.d.19.3. This is a new section. A site-specific criterion for chloride is proposed for Ward Hollow of Davis Creek, based on request from Union Carbide Corporation. The proposed alternate value for Category A and Category B1 is 310 mg/liter. The statewide criterion for chloride for Category A is 250 mg/l; for Category B1 – chronic is 230 mg/liter.
Proposed revisions and Comments Received. This is an entirely new section.

- USEPA commented that site-specific criteria must be based on a sound scientific rationale in order to protect the existing and designated uses. The state submission for approval of such criteria should include documentation of that rationale and the methodology used to develop the site-specific criteria.
- WVDEP suggests "Except that in Ward Hollow . . ."

Board Response. *The Board acknowledges USEPA's comments. We note that the company's proposal was submitted to the agency with requests for comments before the proposal went to notice, but the agency has not provided any review or suggestions to the Board. We agree with DEP's suggested revision.*
Board Action. *Proposal adopted, with revision suggested by DEP.*

§7.2.d.20.2. This section outlines a variance and use reclassification on Little Scary Creek.
Proposed Changes and Comments Received. The Board proposed no changes to this section.

- WVDEP suggests removing reference to alphanumeric system designation.

Board Response. *The Board agrees with the DEP's suggestion.*
Board Action. *Revise section by removing the reference to "K-31".*

§7.2.d.20.3. This section outlines a variance on Simmons Creek. The language provides that the variance "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."
Proposed Changes and Comments Received. The Board proposed no changes to this section.

- WVDEP suggests removing this based on expiration of 1998 date; also suggests removing alphanumeric system designation.

Board Response. *The Board acknowledges the agency's concern regarding the reference to the December 31, 1998 date, and believes that the variance is no longer effective due to the passage of that date. However, we also find that the lack of public notice for this revision works against it's removal at this time. The Board will ensure that this, and any other variances that include a date which has expired, will be reviewed*

and addressed at the next appropriate opportunity, with adequate notice for public review and comment. The Board agrees with the DEP's suggestion regarding the reference to "K-54".
Board Action. *Revise section by removing the reference to "K-54".*

General comment

- USEPA requested that the Board review the entire rule for any site-specific criteria, variances, or other standards that may have expired, and delete any that are no longer applicable.

Board Response. *The Board agrees with the agency's suggestion, but see Board comments in sections 7.2.d.6.1 and 7.2.d.20.3, above.*
Board Action. *No action taken – no change proposed.*

Section 46-1-8. Specific Water Quality Criteria. This section provides explanatory information about the numeric criteria in Appendix E (proposed to be renumbered Appendix C).
Proposed Changes and Comments Received (In addition to revisions outlined by section below, several clerical corrections, and updates to existing references and updating agency names were proposed throughout the section.)
§8.1.a. A citation is included here to the Code of Federal Regulations. The Board asked for comments here and elsewhere in the rule, on taking an approach of citing the regulation and adding to the citation "or the most recent effective version" of that regulation. This approach would alleviate the gaps in time between federal updates and revisions to the standards rule.

- USEPA indicated that in some states the state courts have held that such "prospective incorporation" (state law would automatically change upon revision of federal law without notice or opportunity to comment) is illegal or unconstitutional under some state laws and constitutions and recommended that the Board verify that prospective incorporation would be allowable before adopting such approach.
- One commenter indicated that the proposed approach of adding "or the most recent effective version" would be helpful in keeping state standards current with federal standards.
- WVDEP suggested adding to section 8.1.a an additional reference to the state regulation - 47 CSR 30, section 7.2."

Board Response. *The Board acknowledges that including "or the most recent effective version" would alleviate the problem of keeping our regulations consistent with changes to federal rules. However, the Board believes that that approach would not provide full opportunity for public notice and comment, which we believe is a critical aspect of the development of these standards. We therefore choose not to add the proposed phrase, and instead, we will continue to make every effort to review federal updates and revisions, and respond as expeditiously as possible to those changes.*
Regarding the suggestion by WVDEP to add a reference to 47 CSR 30, section 7.2 – the Board agrees with the agency.
Board Action. *Adopt proposed revisions (those indicated with strike-throughs and underlines in the proposed document; and add a reference to 47 CSR 30, section 7.2..*

Section 46-1-9. Establishment of Safe Concentration Values This section outlines alternative methods for developing criteria for protection of aquatic life where no criterion is included in the rule.

Proposed Revisions and Comments Received. (In addition to revisions outlined by section below, several clerical corrections, updates to existing references and updating agency titles were proposed throughout the section.)

§9.2.a. Although no change was proposed on the definition of "cumulative", the published notice solicited comments regarding the possibility of adopting the Great Lakes Initiative standard for determining whether a substance is bioaccumulative.

- EPA indicated support for such revision generally, but suggested that it be specific as to what portion of 40 CFR 132 – Water Quality Guidelines for the Great Lakes System would be adopted.
- The commenter who originally requested the use of GLI standard, urged the Board to study this issue further and propose a clearer, more defensible definition of the term "bioaccumulative".
- One commenter supported the proposal, indicating that it is in the best interests of the state for bioaccumulation to be a factor for regulations and indicates support for the use of the GLI information in the WQS.
- A commenter indicated that while they do not support the adoption of any GLI based definition of bioaccumulation, they would support a more technically-based definition of bioaccumulation that more accurately reflects a pollutant's potential to reach harmful concentrations in aquatic biota.
- General Comment on Safe Concentration Values section. The Navy recommended removal of the entire section 46-1-9 from the standards and issue as a separate technical guidance or as part of a permit regulation with clarification that the safe concentration value applies to a site-specific discharge and is not a statewide water quality standard.

Board Response. *The Board acknowledges the concern regarding developing an appropriate and workable definition of bioaccumulation in the standards. We will continue to work on this matter, as well as those raised on this section generally, and will include appropriate revisions in the next triennial review, or sooner if appropriate.*

Board Action. *Proposed revisions adopted; no change made to definition of bioaccumulation.*

Appendix A List of Category B-2 – Trout Waters.

Proposed Revisions and Comments Received. This list was updated to add streams recommended by the WV Division of Natural Resources.

- Several commenters urged withdrawal of proposed list of streams until the Board can establish that the stream is capable of sustaining year-round trout populations and until the Board has undertaken an assessment of the cost impact of those listings.
- Commenters indicated that no information has been provided to verify whether all of the proposed streams meet the definition of trout waters.
- Several commenters expressed support for expanded list of trout waters in Appendix A.

- WV Council of Trout Unlimited fully endorses the updated list of trout waters; believe that it is the most complete, comprehensive and scientifically supportable list of trout waters that has been compiled to date.
- Commenter indicated that discharges into newly listed trout waters will be severely restricted. Urge more deliberative approach, including providing local notice of adoption of designation to streams. Others suggest verification of the basis for DNR's determination that the proposed new streams are actually trout streams. Further suggest that the Board should err on the side of leaving a stream off of where there are questions. Board should consider revising trout stream definition. Listing results in over-regulation and may cause problems in the future for those who live beside the streams.
- WVDEP suggests reconsideration of River Basins references in this section.
- Commenter suggested Board withdraw this proposal and develop a more comprehensive and suitable process for making this and future trout water designations.
- Commenter supports the expansion of the list of trout waters and indicates that it should be viewed as a working document, reviewed each triennial.
- Friends of the Cheat and Keel-Haulers Canoe Club support update to trout water list.
- The WVDNR provided additional comments and suggestions which addressed some duplications and added more specific stream code information to be included in the updated list.

Board Response. *The Board acknowledges the interests expressed by all those commenting on this issue. Upon review of the comments, we believe that moving forward with the proposed updated list will ensure appropriate protection of trout waters throughout the state. The WVDNR used its own extensive fish and stream data along with the Board's current definition of trout waters, in developing the recommendations for updating the list. (Note that a review of the current definition of trout waters was conducted during this triennial review, with input from WVDEP, WVDNR and USFWS. That review resulted in the determination that no revisions to the current definition are needed; thus that definition remains unchanged.) Updating the classification of these proposed trout waters will result in appropriate protection of those streams for critical parameters such as dissolved oxygen, chlorinated discharges and turbidity.*

The Board intends to include the updated information provided by the WVDNR during the comment period, which provides more specific stream codes and deletes duplicates on the list.

Board Action. *Proposed amendments, and additional recommendations from WVDNR submitted during the public comment period, adopted.*

Appendix B – List of Category A Waters This appendix includes a list of waters used as public water supplies.

Proposed Revisions and Comments Received. The Board proposed removal of this Appendix because it is outdated, and not needed in light of the current implementation of the Category A use designation.

- USEPA suggested that a statement in the water quality standards be included that would refer the reader to any existing list of public water supplies – such as the WV Bureau for Public Health.
- One commenter indicated opposing the designation of all waters as category A., and therefore is opposed to the proposed removal of the list of Category A waters in Appendix B.

Board Response. *The Board acknowledges the concerns of the commenters and agrees to retain the list, with a statement indicating that it is not intended to exclude any streams designated as drinking waters by WV Bureau for Public Health.*
Board Action. *Proposed change withdrawn - reinstate Appendix B and revise introductory language as outlined above.*

Appendix C – List of Category E-3 Power Production Waters. This list includes all waters used for power production.
Proposed Changes and Comments Received. The Board proposed removal of this Appendix and list because it is outdated, and not needed.

- No comments received.

Board Action. *Amendment adopted as proposed – Appendix deleted.*

Appendix D – List of Category C – Water Contact Recreation Waters. This appendix includes a list of waters used for recreation.
Proposed Revisions and Comments Received. This list and Appendix were proposed to be deleted because it is outdated, and because the recreation designated use is a default use which applies to all waters of the state. Because of that broad application, a list of such waters is not needed.

- One commenter urged the Board to adopt several categories of water contact recreation , ranging from primary contact to secondary contact uses such as boating.

Board Response. *The Board acknowledges the commenters suggestion. WVDEP has also encouraged a review of this designated use category. The Board agrees that such review is warranted, and intends to take it up during the next triennium; or before, if warranted.*
Board Action. Proposed revision adopted – Appendix D deleted.

Appendix E, Table 1
Numeric criteria in table updated and revised to correspond to USEPA's National Recommended Water Quality Criteria: 2002. This effort included the following changes: a number of new parameters added; all parameters listed in alphabetical order; parameters renumbered; the term "not to exceed" removed where it occurs throughout the table; all values adjusted to be expressed in micrograms / liter ("ug/L"), "All other uses" category deleted. Note that if no change is proposed, or if only a change from mg/L to ug/L is the only revision proposed to a particular parameter, it is not included as a proposed revision in the discussion below – unless comments were received on the parameter. The following discussion tracks with the underlined Appendix C in the proposed rule – it may also be reviewed with the "Comparison Chart" provided.

§1 and §2. New parameters Acenapthene and Acrolein added to the table with numeric criteria for protection of Category A and and Category C designated uses. The numeric criteria are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).

Comments Received. No comments specifically on these new parameters. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.

Board Action *The two parameters and numeric criteria adopted as proposed.*

§3. Acrylonitrile. Proposed revision to Category A criterion from 0.059 ug/L to 0.051 ug/L and Category C criterion from 0.66 ug/L to 0.25 ug/L to make consistent with USEPA 2002 Recommendations.

Comments Received. No comments specifically on these new parameters. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.

Board Action *Adopted revisions as proposed.*

§4. Aldrin. Proposed revision to Category A criterion from 0.071 ug/L to 0.000049 ug/L and Category C criteria from 0.071 ug/L to 0.000050 ug/L to make consistent with USEPA 2002 Recommendations.

Comments Received. No comments specifically on these new parameters. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.

Board Action *Adopted revisions as proposed*

§5. Aluminum. No revision proposed to the aluminum criteria.

- Commenter indicated that of all surrounding states, only Pennsylvania has an aluminum criterion. None in ORSANCO criteria. Questions need for criteria – suggests WV should adopt only those criteria that are reasonably expected to be problematic in state waters.
- WVDEP provided information regarding compliance problems with the currently effective aluminum values.

Board Response. *The aluminum criteria were revised in 1995 after a thorough review of the need for the criteria and with involvement of the WVDEP, USFWS and a number of interested stakeholders. At that time the Board adopted EPA's acute criterion of 87 ug/L based on the dissolved fraction of the metal. A conversion factor of 1 was also adopted. During this current review, the Board decided not to review or revise aluminum until receiving an approval or disapproval from USEPA on those values. USEPA has recently approved those revisions, except for the use of the conversion factor. The Board will review the comments bulleted above to determine whether further review is needed during the 2004 - 2007 triennium.*

Board Action. *No action taken on aluminum.*

§6. Ammonia. The human health equation/criterion for unionized ammonia were deleted from the Appendix. This action was taken because the USEPA 2002 Recommended Criteria do not include human health criteria for ammonia. In addition,

the footnote to the ammonia criterion was revised by adding the underlined language in the following sentence: "The early life stage present 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)." ,

Comments Received.

- WVDEP questioned whether Board intended to delete human health unionized ammonia criteria.

Board Response. *The removal was intentional, and consistent with the Board's efforts in using the USEPA 2002 Recommended Criteria as guidelines for the parameters in this table.*

Board Action. *Revisions adopted as proposed.*

§7. Anthracene. This chemical was added as a new parameter to the table with numeric criteria for protection of Category A (8,300 ug/L) and Category C (40,000 ug/L) designated uses. The numeric criteria are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).

Comments Received. No comments specifically on these new parameters. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.

Board Action *Criteria adopted as proposed.*

§8. Antimony Proposed revision to Category A criterion from 14 ug/L to 5.6 ug/L and Category C criteria from 4300 ug/L to 640 ug/L to make consistent with USEPA 2002 Recommendations.

Comments Received. No comments specifically on these new parameters. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.

Board Action *Adopted revisions as proposed*

§9a and §9b. Arsenic and Dissolved Trivalent arsenic. Proposed adoption of EPAs 2002 criteria for arsenic. Proposed revising current values for Category A and C of 50 ug/L by replacing with USEPA's Safe Drinking Water Act Maximum Contaminant Level (MCL) of for Category A and Category C. Although USEPA's 2002 Recommended Criteria Document includes human health values for arsenic, that document indicates that the agency is currently reassessing those criteria.

- USEPA indicated need to state whether newly adopted criteria apply to total or dissolved concentration. If intend to keep the dissolved trivalent arsenic value, as indicated in table, must explain how both would apply.
- Commenter suggests use of dissolved metal instead of total for aquatic life criteria; discourages use of MCL for human health designated uses.

Board Response. ***Aquatic Life Criteria****: The Board intended that the new values of 340 ug/L and 150 ug/L would apply to dissolved arsenic in the water column, and be used in conjunction with a conversion factor of 1, which is included in Table 2. This approach is consistent with USEPA's 2002 Recommended Criteria.* ***Human Health Criteria****: The Board acknowledges concerns regarding using the MCL of 10 ug/L for protection of Categories A and C – including the extended implementation date for that criterion*

established by USEPA. Based on that, as well as the fact that EPA is currently reassessing its National Recommended Values for human health, the Board determined that retaining the current human health values for arsenic is appropriate at this time. We will reassess those values during the next triennial review, or earlier, if needed.
Board Action. ***Aquatic Life Criteria:*** *Delete dissolved trivalent arsenic values in section 9.b (section 8.4.1 of the proposed rule) and adopt proposed values of 340 ug/L and 150 ug/L for acute and chronic for aquatic life categories, as proposed.* ***Human Health Criteria:*** *Proposed MCL value of 10 ug/l withdrawn; current value of 50 ug/L value retained.*

§12. Benzene. Proposed revision to Category A criterion from 0.66 ug/L to 2.2 ug/L and Category C criterion from 71 ug/L to 51 ug/L to make consistent with USEPA 2002 Recommendations.

- One commenter suggests revising Category A and Category C values to 2.2 ug/l and 51 ug/l. Cites footnote in the USEPA National Recommended Criteria – 2002 document for this parameter – which indicates value calculated based on cancer risk of 10-6 (or one case in one million people). Further comments that the 7Q10 flow rate applied with the proposed benzene criteria makes proposal more restrictive than recommended in the USEPA guidance. (See footnote C of EPA 2002 criteria, page 20.)

Board Response. *The Board notes the commenters concern, but believes that further review would be required to ensure that the approach proposed would provide the appropriate level of protection for this carcinogen. The Board notes that the development of the numeric criteria for benzene, and other carcinogens, is separate from the determination of the design flow to be used in implementing those values. The Board has begun a review of the design flows used in implementing the numeric criteria in the table – for aquatic life and human health limits – and will incorporate the concerns raised by the commenter in its review.*
Board Action. *New values adopted as proposed.*

§§13, 14, 15, 16 and 17. New parameters Benzidine, Benzo(a)Anthracene, Benzo(a)Pyrene, Benzo(b)Fluoranthene and Benzo(k)Fluoranthene were proposed to be added to the table with numeric criteria for protection of Category A and and Category C designated uses (see Table for proposed values). The numeric criteria are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).
Comments Received. No comments specifically on these new parameters. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *The 5 parameters and numeric criteria adopted as proposed.*

§18. Beryllium. Proposed deletion of aquatic life criteria consistent with USEPA 2002 recommendations and adoption of USEPA Safe Drinking Water Act MCL for Category A protection.

- WVDEP questioned deletion of aquatic life criterion and suggested that the basis for the revised human health criterion should be noted.

Board Response. *The deletion of the aquatic life values and the currently effective human health value is consistent with USEPA's 2002 recommendations. In this instance, the Board believes that the use of the Safe Drinking Water Act Maximum Contaminant Level (MCL) is appropriate to provide protection for Category A waters.*
Board Action. *Revisions adopted as proposed.*

§§19, 20 and 21. Proposed revision to Category A criteria for alpha-BHC and beta-BHC for Categories A and C to make them consistent with USEPA 2002 Recommendations. The new criteria are lower (more protective) than the current values. (See comparison chart for numeric values). Also revised acute aquatic life criterion for gamma-BHC to reflect updated value in USEPAs 2002 Recommendations. The proposed revision also lowers that criterion.
Comments Received. *No comments specifically on these new parameters. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.*
Board Action *Adopted revisions as proposed*

§§22, 23, 24, 25 and 26. New parameters Bis(2-Chorloethyl)Ether, Bis(2-Chloroisopropyl)Ether, Bis(2-ethylhexyl)Phthalate, Bromoform and Butylbenzyl Phthalate added to the table with numeric criteria for protection of Category A and Category C designated uses. The numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).

- WVDEP suggested adding footnote W from USEPA document which discusses development of aquatic life criteria for butylbenzyl phthalate.

Board Response and Board Action. *The Board has determined that the footnote identified by the agency is for informational, not implementation, purposes, and finds it is not needed at this time. New parameters and numeric criteria for the 5 chemicals adopted as proposed.*

§27. Cadmium. No change proposed.

- WVDEP questioned retention of "not to exceed" language in these sections.

Board Response. *The Board acknowledges the agency's comment, and also has determined that the aquatic life criteria for cadmium should be reformatted to be consistent with other metals which are calculated using a hardness-based equation. The reformatting will result in numeric values calculated based on hardness of 100 mg/l in the table, and a footnote outlining the equation to be used for other hardness values. These changes will address the agency's concern.*
Board Action. *Aquatic life criteria amended as described in Board Response, above.*

§28. Carbon Tetrachloride. Proposed revision to Category A and Category C criteria to make them consistent with those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).

- No comments were received on this section; comments addressing adoption of EPAs more protective criteria, generally, are addressed in General Comments, below.

Board Action. *Proposed revisions adopted.*

§29 Chlordane. Proposed revision to Category A and Category C criteria to make them consistent with those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002). The new criteria are lower (more protective) than current values.

- No comments were received on this section; however, comments addressing adoption of EPAs more protective criteria, generally, are addressed in General Comments, below.

Board Action. *Proposed revisions adopted.*

§30. Chloride. No change proposed to this section, other than adjusting from mg/L to ug/L.

- A commenter objected to the Category A and C criteria because they are not reflective of criteria developed by EPA under CWA – but are secondary drinking water values under SDWA. – intended to address cosmetic or aesthetic effects. Urge deletion of these values.

Board Response. *The Board acknowledges the commenters concern, and agrees that deletion of the human health values is appropriate.*
Board Action. *Amend proposal by removing current Category A and Category C values for chlorides.*

§33. Chlorodibromomethane. This new parameter added to the table with numeric criteria for protection of Category A and Category C designated uses. The numeric criteria are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).

- No comment received on this parameter specifically. Comments on adopting USEPA's recommended human health values generally discussed in General Comments section below.

Board Action. *Parameter and criteria adopted as proposed.*

§34. Chloroform. No changes proposed to this parameter.

- One commenter indicated that chloroform is listed as a carcinogen in the proposal, and provides update of EPAs Toxicological Review of chloroform and the revised Integrated Risk Management System (IRIS) database "file" on the chemical.

Board Response. *The Board acknowledges the commenters information, but notes that chloroform is still listed as a carcinogen in EPAs 2002 National Recommended Criteria Document. We will consider updates to that criterion, including it's classification as a carcinogen, during the next triennial review, or sooner if warranted.*
Board Action. *No change proposed.*

§§35, 36, 37, and 38. New parameters 2-Chloronaphthalene, 2-Chlorophenol, Chlorophenoxy Herbicide (2,4-D) and Chlorophenoxy Herbicide (2,4,5-TP) are added to the table with numeric criteria for protection of Category A and and Category C designated uses. The numeric criteria proposed are those published in USEPA's

"National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).

- No comments received on these particular parameters, but comments on adoption of USEPAs human health values, generally are addressed in General Comments section below.

Board Action. *Adopt new parameters and numeric criteria as proposed.*

§39 Cloropyrifos. This new parameter added to the table with numeric criteria for acute and chronic protection of aquatic life (Categories B1, B2 and B4) designated uses. The numeric criteria are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).

- No comments received on this particular parameter, but comments on adoption of USEPAs human health values generally, are addressed in General Comments section below.

Board Action. *Adopt new parameter and numeric criteria as proposed.*

§40 Chromium III. No change proposed.
Board Comments *During review of all comments on metals using hardness based equations, we have determined that the aquatic life criteria for these metals, including chromium III, should be reformatted to be consistent with other metals which are calculated using a hardness-based equation. The reformatting will result in numeric values calculated based on hardness of 100 mg/l in the table, and a footnote outlining the equation to be used for other hardness values. This metal was also reviewed to determine that the metal specific values in the hardness based formulae are consistent with those recommended by USEPA in it's 2002 criteria recommendations.*
Board Action. *Amended to revise and reformat as discussed in Board Comments section, above.*

§41. Chromium VI. No change proposed.
Board Comments. *Upon review, the Board determined that clarification that only the aquatic life criteria are intended to be implemented as dissolved criteria is needed. Human health criteria are based on total metal in the water column.*
Board Action. *Amended to revise and reformat as discussed in Board Comments section, above.*

§42 Chrysene. This new parameter added to the table with numeric criteria for protection of Category A and Category C designated uses. The numeric criteria are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).

- No comments received on this particular parameter, but comments on adoption of USEPAs human health values generally are addressed in General Comments section below.

Board Action. *Adopt new parameters and numeric criteria as proposed.*

§43. Copper. Proposed adoption of EPA aquatic life and human health criteria.

- Commenter stated that specific numeric criterion included in proposal, but does not adopt footnote included in EPA document – which outlines hardness dependant formula.
- WVDEP made similar comment - suggested removing 43.a and reflect only the appropriate equations of 43.b. and 43.c.
- Another commenter indicated that proposal uses total instead of dissolved fraction. *Not able to find reference to total fraction, as commenter indicates – recommendation above should resolve this.*

Board Response. *During review of all comments on metals using hardness based equations, we have determined that the aquatic life criteria for these metals, including chromium III, should be reformatted to be consistent with other metals which are calculated using a hardness-based equation. The reformatting will result in numeric values calculated based on hardness of 100 mg/l in the table, and a footnote outlining the equation to be used for other hardness values. This metal was also reviewed to determine that the metal specific values in the hardness based formulae are consistent with those recommended by USEPA in it's 2002 criteria recommendations.*
Board Action. *Amended to revise and reformat as discussed in Board Comments section, above.*

§44. Cyanide. *Although no change was proposed originally to this section, during the final review, the Board decided to adjust the description of this parameter to be consistent with USEPA in it's 2002 criteria recommendations. No change was made to the numeric criteria for cyanide.*
Board Action. *Revised as noted above.*

§§45 and 46. New parameters 4,4-DDD and 4,4-DDE were proposed to be added to the table with numeric criteria for protection of Category A and and Category C designated uses. The numeric criteria are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).
Comments Received. No comments specifically on these new parameters. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *The two parameters and numeric criteria adopted as proposed.*

§47. 4,4-DDT. Revisions to the numeric criteria for this parameter for Category A and Category C from 0.24 ng/L to 0.00022 ug/L were proposed.
Comments Received. No comments specifically on these new parameters. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *The two parameters and numeric criteria adopted as proposed.*

48. Demeton. This new parameter was added to the table with a numeric criterion for protection of chronic aquatic life of 0.1 ug/L. The numeric criterion is that published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).

Comments Received. No comments specifically on this new parameter. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *The parameter and numeric criteria adopted as proposed.*

§49. Dibenzo(a,h)Anthracene. This new parameter was added to the table with numeric criteria for protection of Category A and Category C designated uses. The numeric criteria proposed were those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).
Comments Received. No comments specifically on this new parameter. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *This parameters and numeric criteria adopted as proposed.*

§§50, 51 and 52. Numeric criteria for 1,2-Dichlorobenzene, 1,3-Dichlorobenzene and 1,4-Dichlorobenzene were revised for protection of Category A and Category C waters were proposed. The numeric criteria proposed were those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *The revised criteria for these chemicals adopted as proposed.*

§53 and 54. Numeric criteria for two new parameters, 3,3'-Dichlorobenzidine and Dichlorobromomethane were proposed for protection of Category A and Category C waters. The numeric criteria proposed for these human carcinogens were those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002).
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *The revised criteria for these chemicals adopted as proposed.*

§§55, 56 and 57. Numeric criteria for 1,2-Dichloroethane, 1,1-Dichloroethylene and 2,4-Dichlorophenol were revised for protection of Category A and Category C waters. The numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002). The new criteria for these chemicals are lower (more protective) than current values.
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *The revised criteria for these chemicals adopted as proposed.*

§58 and 59. New parameters 1,2-Dichloropropane and 1,3-Dichloropropene are added to the table with numeric criteria for protection of Category A and Category C waters. The

numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002). The new criteria for these chemicals are lower than current values.
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *The revised criteria for these chemicals adopted as proposed.*

§60. Dieldrin. Numeric criteria for dieldrin were revised for aquatic life and human health designated uses. The numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002). The new criteria for this carcinogen are lower (more protective) than current values.
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *The revised criteria for these chemicals adopted as proposed.*

§61, 63 and 64. New parameters Diethyl phthalate, Dimethyl phthalate and Di-n-butyl phthalate are proposed to be added to the table with numeric criteria for protection of Category A and Category C waters. The numeric criteria proposed for the three parameters are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.
Comments Received.

- WVDEP suggested adding footnote W from USEPA document which discusses development of aquatic life criteria for this parameter.

Board Response. Because we are not proposing to add aquatic life criteria, and the the footnote does not provide implementation guidance, the Board finds it not necessary to include in the table. If WVDEP determines a need for regulating the chemical for protection of aquatic life, the Board encourages the agency to use of the provisions of section 9 in this rule. The Board would consider any numeric criteria proposed by the agency in future reviews of the rule.
Board Action *The revised criteria for these chemicals adopted as proposed*

§62, 65, 66, 67, 68, 69, 70, 71, 73, 74. New parameters 2,4-Dimethylphenol, 2,4, Dinitrophenol, Dinitrophenols, 2,4-Dinitrotoluene, 1,2-Diphenylhydrazine, alpha-Endosulfan, beta-Endosulfan, Endosulfan Sulfate, Endrin Aldehyde and Bis(chloromethyl) Ether are proposed to be added to Table 1. New criteria are proposed for the protection of Category A and Category C waters for all parameters. For alpha and beta Endosulfan and Endrin, chronic and acute aquatic life criteria are also proposed. All numeric criteria proposed for these parameters are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.

Board Action *The revised criteria for these chemicals adopted as proposed.*

§72. Endrin. Numeric criteria for endrin for aquatic life and human health designated uses are proposed. The numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.

Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.

Board Action *The revised criteria adopted as proposed.*

§76.a. Fecal coliform. The Board proposed amending the current fecal coiform criteria to allow the use of USEPA's *E.coli* criteria where a sample tested for fecal coliform shows non-compliance with numeric value.

Comments Received

- USEPA indicates alternative use of *E. coli* as proposed may be difficult to implement. Recommends that WV establish transition period during which WQS would include both fecal coliform and *E. coli* for Category C protection for one triennial review cycle. This would allow collection of *E. coli* data while working to include *E. coli* into water quality programs. An alternative method would be to adopt a delayed effective date along with adoption of the *E. coli* standard to allow transition period. Would like to see state remove fecal coliform and adopt the agency's recommended criterion for *E. coli* during next triennial review.
- WVDEP expressed concern about the proposal, including holding time problem for the *E. coli* test. Agency suggests that the Board undertake a more comprehensive review of adoption of EPAs recommended values, including contact illness rates, categorizing degrees of contact, seasonality and flow concerns. Suggest that costs of compliance be included in the fiscal note. Reiterates need for review of Category C, with possible revisions/tiering of recreation uses. Notes typographical error – contact.
- WV BPH/Environmental Health Services commented that the 8 hour holding time holding time requirements for samples tested for *E. coli* and fecal coliform are inconsistent with the protocol outlined in the Board's proposal. The analysis time for running a fecal coliform sample is 24 hours. By the time the results would be available, the 8-hour holding time for the sample collected would have expired, and the sample would be unusable to run the *E.coli* test, according to the protocol outlined in the Board's proposal. The agency indicated further that collecting a second sample would not be acceptable because it would not be representative of the conditions under which the initial sample was collected and therefore would be inappropriate for comparison with the first sample. The agency suggested that if the Board is to pursue the use of *E. coli* as a secondary standard for bacteria, the initial sample should be split and both parameters run concurrently.
- Commenter expressed support for proposed revision but suggested revising footnote "e" (which outlines EPA recommended *E. coli* criteria) to delete requirement for "evenly spaced" samples. Also suggested updating the "confidence level" language to "upper percentiles".

- Commenter acknowledges that the fecal coliform standard is becoming outdated and does a poor job of correlating with human disease, and supports steps toward moving toward use of *E. coli* instead. Expresses concern about two loopholes in the proposal – namely the holding time issue and the possibility of allowing a second sample to be collected to run the *E. coli* test in the event that the first sample violates the fecal coliform test. Suggest abandoning proposal and incorporating a move to both tests over a period of five years. Also indicate need to update/clarify the current Water Contact Recreation Use Category.
- Commenter recommend that the proposed change to the fecal coliform criteria be withdrawn based on concerns that the wording could allow resampling to run the *E. coli* test and because of the implementation difficulties created by the sample holding time requirements. Suggest establishing a transition period from the fecal coliform standard to the EPA recommended *E. coli* standard, which would allow correlations between the two to be developed.
- The National Park Service expressed concern about the proposed amendment to the fecal coliform criteria. Specifically, the agency indicates (citing Standard Methods for the Examination of Water and Wastewater) that the 24-hour incubation time required for the fecal coliform method will not allow the original sample to be reliably tested after that, for *E. coli*. The agency suggests that the Board adopt the *E. coli* standard recommended by USEPA. Alternatives offered by the agency to immediate adoption of *E. coli* include a one- to five-year transition from fecal coliform to *E. coli*, or allowing the use of either fecal coliform, *E. coli*, or enterococci, according to the appropriate EPA guidance for each method. Further, because of the 24-hour incubation time for both methods, allowing further testing would delay the reporting of any noncompliance with the fecal coliform by at least 48 and up to 72 hours from initial sampling. Allowing a second sample to be collected if the first violates the fecal coliform standard is not acceptable because of the dependence of the bacterial contamination on the hydrologic regime in any given stream. Finally the Service comments on the perception of the proposal – it appears that the proposed protocol will result in reduced incidences of noncompliance. The agency comments that this may lead to the perception that water quality has improved, when in fact that is not the case. If this false perception persists, there will be less incentive to improve water quality and less impetus for correcting the widespread delivery of untreated sewage to WV streams.
- Commenter urged reconsideration of the proposed modification to the fecal coliform criterion. They suggest withdrawal of the revision and retention of the fecal coliform criterion and consider over the next two to three years, in coordination with WVDEP, a transition from fecal coliform to EPA's proposed *E. coli* criteria. Concerns outlined about proposal include violations of holding time for an *E. coli* sample and problems with additional sample collection for *E. coli* testing where fecal coliform criterion is violated.
- Commenter expressed concern regarding revision of the fecal coliform criterion to allow additional testing for *E. coli* if the fecal coliform criterion is violated.

- Commenter urged withdrawal of proposal, citing holding times and possible allowance for second sampling for *E. coli* and suggested a phased adoption of *E. coli* over three to five years.
- Future health care professionals Fayette and Raleigh Counties, New River Health Association, Fayette County Water Quality Coalition, Keel-Haulers and WV Professional River Outfitters Association all urged reconsideration of the proposal based on concerns about holding time issue and alternatively, allowance of second sample to be taken for *E. coli* test.

Board Response. *The Board acknowledges the concerns raised by all commenters. We note that it was not our intention that the new language would allow a second sampling to be conducted following a sample showing a violation of the fecal coliform limits. However, we agree that further review of this criterion, and USEPAs recommended values for bacteria are warranted. We will conduct such review and revisit this parameter during the next triennium, or sooner, if possible.*
Board Action. *Proposed revision withdrawn.*

§77. Fluoranthene. Revisions to the numeric criteria for this parameter for Category A and Category C are proposed. The numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *The revised criteria adopted as proposed.*

§78 Fluorene. This new parameter is proposed to be added to the table with numeric criteria for protection of Category a and Category C waters. The numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *The revised criteria adopted as proposed.*

§80. Guthion. This new parameter is proposed to be added to the table with numeric criteria for chronic protection of aquatic life. The numeric criterion proposed is that published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.
Comments Received. No comments specifically on this revision. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *Adopted as proposed.*

§81*. Halomethanes. This parameter was retained, along with the proposed adoption of USEPA values for methylene chloride, methyl bromide, bromoform, and dichlorobromomethane.

- WVDEP questioned retention of "generic" halomethane criterion with adoption of criteria for individual halomethanes.

Board Response. *The Board agrees with the commenter that removing halomethane criteria in light of adoption of individual ones listed is appropriate. The USEPA 2002 recommendations do not include the generic halomethane criteria.*
Board Action. *Delete halomethane criteria (section 81) from Table..*

§81 and 83. Heptachlor and Hexachlorobenzene. Revisions proposed to the current human health criteria for heptachlor and hexachlorobenzene proposed. The numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002. The revised values for these carcinogens are lower (more protective) than current values.
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *Adopted as proposed.*

§82, 84, 85, 86, 87, 88, 90. New parameters Heptachlor epoxide, Hexachlorobutadiene, Hexachlorocyclo-hexane-Technical, Hexachlorocyclopentadience, Hexachloroethane, Ideno(1,2,3-cd)Pyrene and Isophorone are proposed to be added to Table 1, with numeric criteria for the protection of Category A and C waters. Acute and chronic aquatic life criteria are also proposed for Heptachlor epoxide. The numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *New parameters adopted as proposed.*

§91. Lead. Proposed adoption of USEPA's Safe Drinking Water Act "action level" for protection of Category A Waters.

- WVDEP questioned basis for new Category A criterion – suggests Board clarify rationale.
- Another commenter indicates that "action level" is not appropriate substitute for MCL for protection of Category A waters. Proposal results in limit clearly more stringent than the federal provision; more restrictive than those placed on public water systems. Further comment that EPA has raised no objection to existing value. Urge retention of current 50 ug/l limit.

Board Response. *The Board acknowledges concerns raised by commenters, and agrees that the 15 ug/L value is not appropriate for Category A and C protection. The Board notes that the aquatic life criteria for lead are developed using a hardness based equation and proposes to reformat those criteria as noted for other hardness based metals, such as copper.*
Board Action. *Proposal to revise human health criteria withdrawn; 50 ug/L value reinstated. Aquatic life criteria reformatted with numeric values in table and hardness based equation included in footnote.*

§92. Malathion. Proposed adoption of chronic aquatic life criterion for this new parameter in Table 1. The numeric criterion proposed is that published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.

Comments Received.

- WVDEP suggested including proposed chronic value in Category B2, Trout Waters.

Board Response. The Board agrees with the agency's comment.

Board Action. *New chronic aquatic life criterion for malathion adopted for B1, B2 and B4 waters.*

§95.a – 95.c. Mercury Proposed replacing current aquatic life criteria with USEPA's recommended values for dissolved mercury for protection of Categories B1, B2 and B4. Current human health mercury criteria retained.

- USEPA encourages Board to consider adoption of the 2002 National Recommended Water Quality Criteria for mercury – which include new body burden values.
- Another commenter suggests adoption of current MCL of 2 ug/l for inorganic mercury for category A protection.

Board Response. *In our review of this parameter, the Board considered adoption of USEPA's recently developed body burden value for mercury. We were concerned, however, because that agency's implementation guidance for the new body burden value has not been completed. Moving to a body burden value, without instream values, nor implementation guidance would provide little assistance to the WVDEP in implementing the new criteria. We determined that retaining our current human health values until USEPA's implementation guidance is finalized, is the appropriate route to take for this parameter. We note that an revision to this section is needed to provide a reference to the Conversion Factors (CF) for the dissolved aquatic life criteria for mercury.*

Board Action. *Proposed revisions adopted; also adopted reference to conversion factors for aquatic life criteria.*

§95. Methoxychlor. No change proposed.

Board Comments. *In the Board's own review during the comment period, we determined that the current human health criteria for methoxychlor are not consistent with those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.). Based on this review, we propose deleting the 0.3 ug/L criteria for Category A and Category C and adopting 100 ug/L for Category A, consistent with current USEPA recommendations.*

Board Action. *Revise human health criteria as noted in Board Comments, above.*

§§96 and 97. Methyl Bromide and Methylene Chloride. Proposed adoption of new parameters with numeric criteria for protection of Category A and Category C waters. The numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002 for the two criteria.

Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *New parameters adopted as proposed*

§98. 2-Methyl-4,6-Dinitrophenol. Proposed revisions to the current human health criteria. The numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *New parameters adopted as proposed*

§99. Mirex.. Proposed adoption of chronic aquatic life value of .001 micrograms/liter, for this new parameter. The proposed criterion is that published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002. according to EPAs 2002 recommendations.

- Commenter indicated that mirex was an insecticide primarily used in the southeastern states to control fire ants and which was also used as a flame retardant for plastics, etc; its use was discontinued in the US in 1972. There is no reason to believe that it is present in WV waters today at a measurable level.

Board Response. *While the Board acknowledges the commenters concern, we believe that adoption of the criterion is warranted. The location of the chemical's ultimate use is not the only factor to be considered in determining whether a chemical may or may not be in the waters of West Virginia. Including the parameter in the rule will ensure appropriate regulation of the chemical if there is the potential that it could be discharged into our waters.*
Board Action. *Adopted as proposed.*

§100. Nickel. No change proposed. Based on comments received on other hardness based metals, Board proposes reformatting the aquatic life criteria for nickel to place numeric criteria, calculated at a hardness of 100 mg/L in the table, and including the hardness based equation in the footnote.
Board Action. *Revised as noted above.*

§102. Nitrite. This parameter, currently included in the Table, was proposed to be deleted because USEPAs 2002 Recommended Criteria do not include a criterion for nitrite.
criteria

- WVDEP questioned removal of this parameter, suggested possible oversight?
- USFWS commented, outlining the pertinent portions of the nitrification process - specifically, situations where nitrification is inhibited, resulting in increased nitrite concentrations instream. The comments further provide an analysis of published literature regarding nitrite toxicity in aquatic species. The agency indicates that USEPAs recommendations in the 1986 Gold Book

of 5 mg/l would be protective of warm water fish. Further USFWS suggests that 0.06 mg/l should be protective of salmonids. The agency's comments acknowledge that USEPAs 2002 recommended criteria does not include nitrite criteria for the protection of aquatic life, and has not been able to determine that agency's basis for not including criteria for nitrite in the 2002 document. The Service's recommendation is to retain the current nitrite criteria for aquatic life in the rule. If it the criteria are removed, the Service requests an opportunity to review the scientific information used to support the removal.

Board Response. *The Board acknowledges the concerns expressed by the agencies, and agrees that removal of this parameter may be premature. The current values will be reinstated, and the Board will continue to review the need for the criteria, including USEPA's basis for deleting it from the 2002 Recommended criteria document.*

Board Action. *Proposed revision withdrawn – nitrite criteria reinstated.*

§103. Nitrobenzene. This new parameter is proposed to be added to Table 1.. The numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.).

Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.

Board Action *New parameter adopted as proposed*

§§104, 105, 106, 107, 108, 109 and 110. New criteria for nitrosamines as well as 6 new nitrosamine compounds are proposed to be added to the table: Nitrosodibutylamine, N, Nitrosodiethylamine, N, N-Nitrosodimethylamine, N-Nitrosodi-n-Propylamine, N-Nitrosodiphenylamine and Nitrosopyrrolidine, N. Numeric criteria are proposed for the protection of Category A and Category C waters. All numeric criteria proposed are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.

Comments Received.

- Comment indicated that there is little value in adopting specific criteria for individual compounds along with more stringent "generic" value for nitrosamines. Also commented that criteria are below limits of detection for EPA approved analytical methods.

Board Response. *The Board acknowledges the concern, but notes that including the generic category will be consistent with current USEPA recommendations. The Board will continue to review this criterion and will consider any appropriate revisions during the next triennial review, or sooner if necessary.*

Board Action *New parameters adopted as proposed*

§112. Dissolved Oxygen. No change proposed.

- WVDEP commented regarding retaining references to Kanawha River Zones 1&2.
- Commenter expressed concern that the Board did not propose to adopt USEPAs recommended dissolved oxygen criteria along with the other USEPA criteria

proposed for adoption, citing lower minimum concentration levels in the EPA criteria and the recognition in EPAs criteria that DO concentrations at any given time may be below the average value, due to natural conditions, without having an adverse effect on aquatic life. Cite efforts by the NCC regarding consideration of a definition of adverse impacts related to excess nutrients that will be determined at leas in part based on DO concentration. Urge Board to adopt the Gold Book criterion for DO for protection of aquatic life

Board Response. *The Board agrees with the WVDEP's comment regarding references to the river zones. Regarding the aquatic life criteria for DO, the Board reviewed current criteria with input from WVDEP, WVDNR and USFWS. Based on its review, the Board has determined that the dissolved oxygen criteria currently in the rule provide the most appropriate level of protection for aquatic life. We note that the natural background exemption was revised to allow applications for variances from this, and other parameters on trout waters, where the natural background levels of parameters exceed the statewide criteria. We believe this provides an opportunity for site-specific revistions to the dissolved oxygen criteria where necessary, but retains the criteria, and the protection it affords, elsewhere in the state.*

Board Action. *No action taken – current dissolved oxygen criteria retained.*

§§113 and 114. New parameters Parathion and Pentachlorobenzene are proposed to be added to Table 1. Numeric criteria proposed for the two chemicals (aquatic life criteria for parathion and human health criteria for pentachlorobenzene) are those published in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.

Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.

Board Action *New parameters adopted as proposed*

§115. Pentachlorophenol. Numeric criteria for this parameter are proposed to be revised by adopting the aquatic life and human health numeric criteria in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.)

- One commenter indicated that USEPA value includes footnote with pH dependant formula.
- WVDEP suggests " reverting to the existing language referring only to te use of the formula and applying an "x" in the applicable Aquatic life columns."

Board Response. *The Board agrees that clarification of this section would be helpful. We propose retaining the numeric criteria for aquatic life in the columns in the Table and moving the pH-based formula to a footnote, with an explanation of how it is to be use.*

Board Action. *Adopt proposed changes with revisions outlined in Board Response above.*

§116. pH. Proposed revising this section by changing human health criteria from 6.0 – 9.0 to 5.0 – 9.0 and by removing language "higher values due to photosynthesis may be tolerated"

- WVDEP questions whether Board intended to remove current language allowing for higher values caused by photosynthetic activity.
- Dominion urges Board not to delete the phrase" higher values due to photosynthesis may be tolerated" and urges allowing a site specific exemption from the upper pH standard in limited situations where wastewater treatment of stream restoration practices beneficially causes the pH of a waterbody to exceed 9.0 SU.

Board Response. *The Board acknowledges the commenters concerns and agrees to reinstate the language "higher values due to photosynthetic activity may be tolerated" to this section.*
Board Action. *Revised proposal as noted in Board Response.*

§117. Phenol. Proposed revision of human health criterion for Category C waters, consistent with USEPAs 2002 Recommendations.

- No comments received.

Board Action. *Adopted as proposed.*

§118*. Phthalate esters. No change proposed.

- WVDEP suggests that a defined list of phthalate esters be provided.

Board Response. *The Board acknowledges the agency's concern, and upon review of the USEPA recommendations, has determined that there is not currently recommended value for phthalate esters. That parameter will be deleted from the rule.*
Board Action. *Delete parameter and numeric criteria.*

§118. PCBs. Revised to change units from ng/L to ug/L.

- Acacia pointed out that current human health value for PCB is .000064 ug/L.
- Commenter expressed concern about EPA's recommended value of .000064 – indicating concerns based on both toxicological basis and fact that value is less than the minimum detection limit of 20 picograms/L. Recommended that current criterion of .044 ug/l is more scientifically defensible and also is measurable using approved analytical methods
- Navy recommended clarification of the PCBs human health and aquatic life criteria and to be consistent with EPAs 2002 recommendations.

Board Response. *We agree with the comments and propose revising the Category A and B values to reflect EPA 2002 recommendations. We acknowledge the commenters concern regarding the detection limit, but find that that is not a basis for failing to include the parameter in the standards.*
Board Action. *Adopt proposed revisions, and those discussed in Board Response, above.*

§121*. Polynuclear Aromatic Hydrocarbons (PAH's). No change proposed to this parameter.

- DWR suggests that a "generic" PAH value not needed in light of proposed adoption of values for acenapthene, anthracene, fluorine, fluoranthene and pyrene.

Board Response. *The Board agrees with this comment and proposes deletion of the PAH value.*

Board Action. *Propose deletion of PAH criteria..*

§119. Pyrene. Proposed adoption of this new parameter with numeric criteria for protection of Category A and Category C waters. The numeric criteria proposed are those in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.)

Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.

Board Action *New parameter adopted as proposed*

§120. Radionuclides. Proposed adoption of federal Safe Drinking Water Act radionuclide values statewide, and ORSANCO values for the Ohio River mainstem.

- Acacia commented that the federal DW value for uranium is 30 ug/l, rather than 20 ug/l, as proposed. Further – this value should be for groundwater – not needed in surface water standards.
- Acacia commented that Radon based on Primary Drinking Water Standards for Groundwater – suggested use of radon in surface water inappropriate because of rapid evaporation or radon from surface water.
- Commenter indicated error in radium 226 and 228 value – should be 5 pci/L..
- Total Beta and photon activity should be 4 mrem/year.
- Acacia commented that current rule has exclusion that does not require isotopic analysis of radium if the total radioactivity of the sample is less than 5 picocuries /L. Result could be permit holder required to do such testing – even where no exceedence of total activity criterion. Cost could exceed $170/sample.

Board Response. *The Board acknowledges the commenters concerns, and has determined from them, and from additional review of the Safe Drinking Water Act radionuclide values that revisions to the proposal are needed. The Board proposes the following values: Alpha particles: 15 pCi/L, Beta particles and photon emitters: 4 mrem/yr, Radium 226 and 228 (combined): 5 pCi/L and Uranium: 30 ug/L.*

Board Action. *Proposal revised as noted in Board Response above.*

§121. Selenium. Proposed revising Category A human health criterion for selenium. Also added footnote to chronic aquatic life criterion indicating that the criterion is expressed as total recoverable, but allows for use of conversion factor of .996 to convert to dissolved.

- USEPA recommends that the Board provide to USEPA a scientifically defensible rationale to support its revised selenium human health criterion. Further advises that the appropriate conversion factor (0.922) be included for implementation of the dissolved selenium criteria for aquatic life protection.
- WVDEP suggests option to use total recoverable or dissolved could be problematic. Urges Board to include only one of these options.

Board Response. *The Board agrees that clarification of this parameter is needed. We propose additional revisions by deleting the 20 ug/L value for acute aquatic life protection and replacing with the equation in footnote L of EPA's recommendations*

which hprovides "The CMC = 1/[(f1/CMC1) + (f2/CMC2)] where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 ug/l and 12.82ug/l, respectively". Further the Board agrees to revise the Category A numeric criterion from 50 ug/L to 170ug/L for consistency with USEPAs recommendations.
Board Action. *Revise proposed revisions as outlined in Board Response, above.*

§122. Silver. No change proposed.

- The Department of the Navy recommended repealing the existing chronic aquatic life criteria for silver.

Board Response. *Based on this comment, and further review of USEPA recommendations, the Board proposes revising this parameter by deleting the human health criteria for silver and by deleting the chronic aquatic life criterion. Further, the Board proposes reformatting the acute aquatic life criteria consistent with the other hardness based metals criteria elsewhere in the rule.*
Board Action. *Revised as outlined in Board Response, above.*

§126*. Dissolved solids and Salinity. Board proposed adoption of EPAs Gold Book value for Category A.

- WVDEP suggests that numerous waters may have background levels exceeding the proposed criterion, particularly in waters with moderate to high levels of alkalinity. Suggests looking at other states' values.

Board Response. *The Board acknowledges the commentes concern and agrees to remove the proposed criteria from the rule.*
Board Action. *Proposed change withdrawn.*

§123. Sulfide-Hydrogen Sulfide. The Board proposed adding USEPAs recommended value for this parameter.

- No comments received on this revision.

Board Action. *Adopt revision as proposed.*

§124. 2,3,7,8-TCDD (Dioxin) Proposed revision - adoption of EPA's 2002 National Recommended criterion.

- Acacia commented on detection limit problems with both the existing and proposed EPA criteria for dioxin. Indicate that even high volume sampling technique (used by EPA to develop 2001 TMDL for dioxin for Kanawha and Ohio Rivers) would not be capable of measuring proposed concentration. Recommend no revision, unless raise limit to meet detection limit of 10 parts per quadrillion.

Board Response. *The Board notes the commenters concern, but believes that the technical detection limitations are not grounds for failing to include a criterion in these standards.*
Board Action. *Adopted as proposed.*

§125. Temperature. Proposed changing "cold water" to "trout water", corrected calendar references.

- WVDEP commented on references to alphanumeric codes as well as reference to section 7.1.d in 129e, which should be deleted.

§126. Tetrachlorobenzene, 1,2,4,5. Proposed adoption of this new parameter and mueric criterioa for the protection of Category A and Category C waters. The numeric criteria proposed are those in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.)
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *New parameter adopted as proposed*

§§127, 128 and 131. Revisions to criteria for 1,1,2,2,-Tetrachloroethane, Tetrachloroethylene and Toxaphene proposed. The numeric criteria proposed are those in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.)
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *Revisions adopted as proposed*

§130. Toluene. No change proposed.
- Acacia noted that toluene listed as carcinogen in WV criteria, not so in EPA's 2002 recommendations.

Board Response. *The Board agrees with the commenter and proposes deleting the footnote indicating that the chemical is a carcinogen.*
Board Action. *Revised to delete footnote "b".*

§§132, 133, 134,135, 136, 138 and 139.. New criteria proposed for 1,2-Trans-Dichloroethylene, Tributyltin, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichlorophenol 2,4,5- and 2,4,6-Trichlorophenol for protection of Category A and Category C waters. (Tributyltin values for protection of acute and chronic aquatic life). The numeric criteria proposed are those in USEPA's "National Recommended Water Quality Criteria: 2002" (EPA-822-R-02-047 November 2002.)
- Commenter indicated that the chemical is used as an antifouling agent in paint on ocean going vessels., and for vessels less than 25 M in length, has been banned. Indicates that there is no reason to believe WV waters have any measurable levels of the chemical. Comments that the Board should not adopt criteria which are not considered to be likely contaminants in state waters.

Board Response. *The Board acknowledges the commenters concern, but has determined that the ultimate use of the product is not the only factor to be considered in adding a pollutant to the standards. We believe that incorporating USEPAs recommended values will provide the broadest protection to state waters, and if they do not occur here, will not cause hardship in their implementation.*
Board action. *Parameters adopted as proposed.*

§137. Trichloroethylene Revisions proposed to numeric criteria this parameter consistent with USEPA's 2002 recommendations.
Comments Received. No comments specifically on these revisions. General comments regarding adoption of new USEPA parameters outlined in General Comments section below.
Board Action *Revisions adopted as proposed*

§140. Turbidity. Proposed update to reference to state Nonpoint Source program. Also sought comment on request to remove the exemption for coal mining activities from the turbidity criterion.

- USEPA indicated support for removing the exemption and reminded that water quality criteria exemptions must be based on 304(a) guidance or other scientifically defensible methods.
- USFWS referred to comments on turbidity submitted to the Board during the preliminary comment stage of the triennial review. Those comments recommend retention of the turbidity criterion as an indirect measure of suspended solids. Regarding the current exemption for coal mining activities from the turbidity criteria, the Service states that based on observations made at surface mining site visits, they believe that there are significant turbidity and sedimentation stream impact from those activities. The agency recommends that DEP evaluate turbidity and sedimentation effects from exempted activities and that the Board review the validity of exempted activities based on the results of such evaluation.
- Commenter suggests that replacing the reference to the 208 Water Quality Management Plan with a reference to Nonpoint Source Management Plan is more than a reference update and creates a broader exemption from turbidity criterion than under the current reference. States that at least construction, and probably other activities, were not exempt under the "208 Water Quality Management Plan". He further suggests that some activities listed in the Nonpoint Source Management Plan are actually point sources, which would not be exempt from the turbidity criterion, but as "activities at which BMP's in accordance wit the Nonpoint Source Management plan are being utilized . . ." they **are** exempt. Regarding the exemption for surface mining activities, commenter indicates that such exemption is not appropriate, and that streams with mines deserve the same protection as other parts of the state. He opposes the exemption of an entire industry or category of activity from a criterion. Cites statement by DEP regarding the problem of sediment as a pollutant in sates waters ("degrades more miles of stream than any other pollutant")
- Commenter articulated distinctions between turbidity and suspended solids; outlined current limits/regulatory limitations incorporated in mining permits which limit total suspended solids and settleable solids and indicate support for retaining the current exemption from the turbidity criteria for coal mining activities.

- Commenter described the history of the turbidity criterion and the EPAs current efforts to compile information on turbidity, suspended solids and sediment. Supports proposal/recognition of use of BMP's to demonstrate compliance.
- Commenter indicated that it is inappropriate to exempt from turbidity standards non-point sources exercising BMP and sites with surface mining permits. Fins such exemptions inconsistent with the language throughout the WQS. Also concerned about the explanation that the criterion is addressed adequately by other programs and other regulatory protections – believes that review, regulation and protection of the waters by those issuing coal permits should be based upon the foundation of the state's WQS, not the other way around.
- Commenter urges retention of the current turbidity exemption for coal mining activities. Narrative criteria already address excessive discharge of solids; MD only surrounding state that uses a turbidity value; coal operations are subject to engineering controls and permit limes for control of solids; turbidity is not a pollutant but a measure of the optical property of water; current turbidity criterion outdated. *Note – PA WQS include numeric turbidity values for one watershed; 31 states plus Puerto Rico include numeric turbidity values.*
- Another commenter supports elimination of the exemption for coal mining from the turbidity criteria, indicating that the current technology based effluent limits for TSS in the mining program are often inadequate to protect the quality and uses of streams – especially during rain events. The comments indicate that the current TSS effluent limit in the mining permits does not address the requirement in section 3.2.a which prohibits any "visible floating or settleable solids, suspended solids . . . .". While section 3 establishes that sediment loading is unacceptable; neither the turbidity standard nor the technology based TSS effluent limit are sufficient to prevent sedimentation problems from coal mining operations.
- Commenter opposes exemptions to turbidity criteria for nonpoint source activities using BMPs and surface mining activities.
- Commenter urges deletion of the mining exemption from the turbidity standard.
- Another commenter does not support exemption from turbidity standard for nonpoint sources using BMPs and sites with surface mining permits – urges removal of the exemptions.

Board Response. *The Board appreciates the responses on this proposal. Upon review, we decline to revise the exemption for surface mining activities in this section. We will continue to review this criterion during the next triennium to determine whether revisions may be warranted.*

Board Action. *Amendment adopted as proposed.*

141. Vinyl Chloride. Proposed revisions to this parameter for protection of Category A and Category C waters, according to USEPAs 2002 recommendations.

- No comments received on this revision

Board Action. *Revisions adopted as proposed.*

§142. Zinc. No revision proposed.

- USEPA suggested that the Board consider adopting the updated zinc criteria outlined in the National Recommended Water Quality Criteria, 2002 (EPA-822-R-02-047) during this review.

Board Response. *The Board acknowledges this comment, and agrees to adopt the human health criteria in EPAs National Recommended Water Quality Criteria, 2002 (EPA-822-R-02-047). Further, we propose revising this section by reformmating as we have the other hardness based metals criteria.*
Board Action. *Revised section as outlined in Board Response above.*

Miscellaneous non-priority pollutants. One commenter expressed concern on the adoption of criteria for parathion, malathion, methoxychlor, Demeton 2,4,5, TP and 2,4,D, "which may or may not have been used in WV and for which no showing has been made that there is any evidence of impairment of WV waters by the materials". Commented that the Board should not be adopting criteria for these materials based on the assumption that they are a problem in other state's waters.
Board Response. *We appreciate the commenters concern but find that developing such information would be a task beyond the state's capability at this time. We believe that adoption of these parameters, and all the parameters proposed herein, is appropriate, and will assist the state in determining the extent of their existence in state waters.*

Footnote 1. Navy suggested replacing "one hour average concentration" with "short duration (which varies depending on the pollutant) average concentration"
Board Response. *The Board acknowledges the commenters interest, but chooses to retain current frequency and duration language included in the rule. We may reconsider this provision during the next triennial review, if it is warranted.*
Board Action. *No change proposed.*

Footnote 5. No change proposed.

- WVDEP suggests correction to reference to Appendix E, by adding Table 1.

Board Response. *Board agrees with commenter; proposes labeling table correctly.*
Board Action. *Revise table as noted.*

Appendix E, Table 2. Conversion factors for mercury added to this table.

- No comment received.

Board Action. Adopt revision as proposed. Also revise table by deleting "III" from the parameter "arsenic" in the table, consistent with USEPA recommendations.

General Comments. The following are general comments received, which did not result in revisions to the rule. Board responses indicated (in italics) where they have not been included elsewhere in this document.

- USEPA suggests facilitating early exchange of information with the Fish and Wildlife Service and National Marine Fisheries Services to expedite federal review of compliance with the standards revisions with the federal Endangered Species Act. *Agree – have sought and received comments from that agency throughout the review process.*
- Lack of federal mandate. Commenter expressed concern that the boards decision to adopt all of the criteria for toxic pollutants ever been developed by USEPA results in an unduly and unnecessarily stringent approach. Recommends that the Board use provision in EPAs National Toxics Rule to satisfy the triennial review requirements. *The Board believes that approach of adopting EPAs recommended criteria is warranted, and provides appropriate protection to state waters. Where dischargers are unable to comply with criteria or find criteria to be inappropriate, alternative mechanisms are available to provide relief. The Board has historically worked with permit holders/applicants and the WVDEP to address situations where criteria are found to be unnecessarily stringent or where a discharger may need time to develop appropriate controls to meet the criteria. We continue our willingness to assist in these ways, as needed.*
- Length of comment period. Two commenters urged the Board to withdraw its proposals and to immediately undertake the preparation of supporting materials that would result in the promulgation of a new rule with a more appropriate technical and policy basis. Another suggests adoption of only parameters with sufficient support and which have received individual review. Requests more time for facilities to review individual parameters. *The Board has been working on this review for a number of months, and has provided notice of all meetings where discussions have occurred. We have also published these revisions in accordance with the State Administrative Procedures Act, and held a public hearing to take comment on the proposal. While we acknowledge the concerns raised, we believe that we have provided the public with sufficient opportunity to review these proposals, and are and believe that it is important to move forward with them.*

- Commenter indicated that proposals to adopt standards which have no known actual or potential applicability to WV is inappropriate.
- Another commented that there should be a demonstrated link between the adoption of additional water quality criteria and the potential for related adverse impacts to West Virginia surface waters.
We acknowledge this concern, but find that making such determination about these chemicals would be a difficult task, which we believe is unwarranted. Adoption of these new parameters is consistent with the goals of the federal Clean Water Act, and will help to ensure protection of the aquatic life and human health designated uses. As noted elsewhere, alternative avenues are available to address any site-specific implementation concerns that arise.

- Commenter suggests three step approach to evaluation of new criteria: are pollutants being discharged: If so, are they interfering w/designated uses? If so

should national criteria be applied or other derived numeric criteria?. *We appreciate this recommendation, but find such review unworkable with current resources and unnecessary, given the other alternatives available to address site-specific needs. See other comments, above regarding the Boards chosen approach.*

- Public Water Supply use designations. Comments indicate that it is critical to the establishment of these regulations that the board establish which receiving streams are subject to the Public Water Supply use designation; they also expressed concern regarding deletion of the Appendix B, which outlines the list of public water intakes. Another opposes designation of all waters as category A., and therefore are opposed to the proposed removal of the list of Category A waters in Appendix B. Another proposes language establishing compliance point for Category A to be at surface water intakes, with a ½ mile zone above intakes protected at the discretion of the Director. *The Board is aware of the concerns surrounding this matter. Many comments have been considered in the Board's ongoing review of the application of the Category A use designation over the last several years. The most recent action taken is the promulgation of a procedural rule which provides a mechanism for removal of that designated use on an expedited basis. Because of the extended effort on this issue to date, as well as the extensive list of additional review items, we chose not to take this issue up during the triennial review.*

- Design Flow Considerations.
  - Two commenters urge a decision now, rather than further review of adoption of harmonic mean flow for discharges of carcinogens. Both commented that to do otherwise is inconsistent with the 10^{-6} (one case of cancer per 1 million people) cancer risk factor used in establishing the criteria for carcinogens.
  - Commenter recommended adoption of HMF for carcinogens, or delay adoption of any new values for carcinogens until design flow resolved. Suggested alternative might be to "recalculate the proposed standard on the basis of the 7Q10 flow using the statistically based relationships developed by USEPA as reported in the Tech. Support Doc. For Water Quality Based Toxics Control (March 91, p.88.) Another is to adopt criteria with a 10-6 (1 case in one million people) risk basis by converting the EPA recommended criteria to their 7Q10 equivalents. Further recommend adoption of new carcinogens only if HMF adopted. Commenter attached document outlining comparison values.
  - Other commenters provided similar concerns, indicating that "the criteria for carcinogens in Appendix E is unlawful as presently stated". Citing the statement in 8.2.a that the criteria for carcinogens are "based upon an estimated risk level of one additional cancer case per one million persons . . ." they argue that by using a 7Q10 flow rather than HMF, that the criterion violates that mandate. WV LWV supports the continued use of the 7Q10 design flow.

- Commenter indicated support for EPAs recommended design flows, including 1Q10 for acute aquatic life and harmonic mean flow for human carcinogens.
- Commenter expressed support for retention of 7Q10 – outlined concerns about adoption of harmonic mean flow and questions that should be addressed in future discussions on that issue.
- Comments provided in support of allowing use of harmonic mean flow for carcinogens or adopt a permitting procedure that adjusts the effluent limit to account for the difference between the 7Q10 and harmonic mean determined for a particular stream.
- Another commenter provided comments outlining issues that they believe should be included in further study regarding adoption of the harmonic mean flow as the design flow for developing permit limits for carcinogens.

Board Response. *The Board acknowledges concerns expressed by all commenters on the design flow to be used in implementing these criteria. As the commenters are aware, the Board has made a commitment to conduct a thorough review of this issue. We find however, that moving forward with these proposed revisions is warranted, even with that review ongoing. We note that the design flow was the subject of a stakeholder process in 1992 and 1993, and that review resulted in the retention of the 7Q10 flow. Until revised, this design flow will continue to be employed in regulatory programs, as appropriate. We also note that the provisions describing the cancer risk factor in the rule are not stated as absolute requirements for the criteria, but rather, as indicated in footnote b, has been used to develop the human health criteria for carcinogens. We do not believe that a more protective implementation of these parameters, such as the use of the 7Q10 design flow, violates the standards, or any other applicable law or regulation.*

- Assessment of economic impact. Commenter urges the Board to prepare a cost impact of its proposed changes to the regulated community
- Fiscal note – Commenter urges more specific cost analysis to be included in fiscal note.. Another commented that the Board failed to outline costs to industrial community and state citizens – urge more detailed explanation of the effects of the proposed rule, including the effect of its rules on the economic development and industrial growth in the state..
  Board Response. *We acknowledge the commenters concerns, and hope to work with them to develop such information.*

- Commenter indicated that use of drinking water values for protection of aquatic life is indefensible. Others indicated that in some cases DW MCLs not appropriate as substitute for instream human health criteria – but more appropriately applied to groundwater – example radon.. Acacia suggested application of DW MCLs for Category B protection inappropriate. *No such application of DW MCLs to aquatic life use was intentionally applied. We*

reviewed application of MCLs and treatment levels and revised as noted in the document. We believe this addresses the comment received.

- Commenters expressed concern about situations where the numeric criterion is lower than the minimum detection limit (dioxin, PCBs) and stated that the Board cannot propose WQS that are unmeasurable and unenforceable. Concerned about increased analytical cost to permit holders, especially the costs of investigating false positive tests or falsely high test results. Indicate that this situation means impossible to determine whether water impaired for 303(d) listing purposes/TMDL development. (commenter included attachment on this issue).
- Century Aluminum commented on lack of adequate method detection limits to measure compliance with WQS – result = increased permit responsibilities and added compliance costs for the facility. Proposed rule adds more parameters posing this problem.
  Board response: *We acknowledge this concern but find that this factor is not sufficient to preclude adoption of these parameters in the standards. To our knowledge, this can, and has, been addressed in the permitting process with no negative impact to the regulated community specifically noted. If such impacts are occurring, the Board welcomes further discussion of this matter with those interested.*

- Commenter urges adoption of several categories of water contact recreation. *The Board considered this as a preliminary matter and agreed that it is important – intends to look at this issue during the next review, or sooner, if warranted.*
- Commenter urged future consideration of broadening the definition of wet weather streams to include ditches and to include a groundwater parameter to the protections allotted in the numeric water quality standard exception for wet weather streams. *We considered this suggestion during the review and determined that a change is not warranted. We are willing to undertake continued review if warranted, during the next triennium.*

- Include units in table – all have been revised to reflect micrograms/liter ("ug/l") – this could go in header for each column. *Agree, revision made in final proposal.*
- WVDEP questions whether Board intentionally removed criteria for "All other uses"? Regarding retention of Fl criterion for all other uses – suggested reconciliation of the fl criterion with ORSANCO's and Health Dept requirements. Alternatively suggested listing more restrictive value for Ohio River as new # 79a. *We did remove this category intentionally – retaining only the fluoride criterion. Remain willing to review these additional comments in future reviews, as warranted.*
- WVDEP suggests consideration of adoption of 15 priority pollutants listed and revised in the December 12, 2002 Federal Register Notice. *The Board*

agrees to review these criteria and incorporate them, as appropriate, at the soonest opportunity.

- WV Chamber and others urge reconsideration of adoption of Drinking Water MCLs for protection of Category A use designation. *The Board adopted MCLs only where no recommended criteria are available in EPAs 2002 recommendations. Although not required, this is consistent with EPA recommendations for protecting the public water supply designated use.*

- One commenter objected to the presentation of Table 1, with all language indicated as new. Suggested this hindered public's ability to provide meaningful comments. *Note: Three versions of Appendix E were provided with the notice. One with all proposed language – with all language underlined; one with all language stricken, and one with proposed deletions stricken and new language underlined. Board staff was aware of the presentation problems and considered several options and sought assistance from Legislative Rule-Making Review Committee staff in preparing the revised Table. The chosen method is consistent with that agency's recommendations.*

- One commenter indicated that they are appalled that the Board looked at only parameters where existing WV standards are less stringent that the updated (2002) standards by EPA. Sought to determine whether Board or Board staff made the decision to revise only those less stringent than EPAs. *Note that the Board did review all new USEPA criteria and specifically addressed a number of situations where EPA's new criteria are less stringent than current WV standards. See Appendix C, Table 1 for these revisions.*

- Commenters suggest that the Board mistakenly believes that it is required to have criteria for all priority toxic pollutants for which EPA has established guidance. Cites National Toxics Rule which provides alternative options. Cite sampling costs, problems with potential false positives, and criteria possibly more stringent than necessary to protect designated uses as problems with Board's approach of adopting all of EPAs recommendations. Suggest phased approach to review and adoption of USEPA criteria. *We are aware that alternative approaches are available for review and update of the numeric criteria. See explanation/basis for the Board's approach in other responses, herein.*

- Several commenters suggested this Appendix be "renumbered" Appendix B. *Agree, and renumbered appropriately.*

- Commenter indicated general support for moving WV's parameters to USEPA's level of protection. Recommended that updating the numeric criteria for water quality parameters becomes a periodic practice of the EQB

and that the effort continue to be approached with the philosophy of at leas meeting federal levels of protections for WV's waters.

- Another commenter expressed support for the adoption of EPA's Recommended Water Quality Criteria – 2002. *We appreciate the commenters suggestion and intend to continue to update the regulation, including the numeric criteria, as often as is warranted, but at least during each triennial review.*

- Navy recommended adding a footnote to Table 1 of appendix allowing that metals criteria should also be expressed as a function of the water effect ratio (WER) as recommended by EPA in the California Toxics rule, May 18, 2000. *We acknowledge the comment and will consider this in the next review – we note that WERs have been used to support several site-specific numeric criteria incorporated in the rule in section 7.*

* Indicates numbering inconsistency because parameter deleted in final proposal. The section # provided reflects numbering system in the proposal that went to public notice.

COPY

BEFORE THE ENVIRONMENTAL QUALITY BOARD
CHARLESTON, WEST VIRGINIA

PROPOSED REVISIONS TO WATER QUALITY STANDARDS RULE
(46 CSR 1 "REQUIREMENTS REGARDING WATER QUALITY STANDARDS)

PUBLIC HEARING
JUNE 18, 2003

Transcript of the public hearing held before the said Environmental Quality Board on the 18th day of June, 2003, commencing at 7:03 p.m., EDST, at 1615 Washington Street, East, Charleston, West Virginia, and reported by Karen R. Meyers, Certified Court Reporter.

BEFORE: EDWARD SNYDER, Chairman
EDWARD C. ARMBRECHT, JR.
CAMERON HACKNEY
CHARLES JENKINS

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JUN 30 2003
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COURT REPORTING

INDEX

INDIVIDUAL SPEAKERS:

Charles Armstead	Page 5
Tom Boggs	Page 8
Mindy Armstead	Page 11
Eli McCoy	Page 16
Lisa Burgess	Page 21
Randy Maggard	Page 24
John Hill	Page 27
Joyce McCune Gentry	Page 30
Jason Bostic	Page 32
Randy Boyd	Page 36
Jennifer Boyd	Page 40
Margaret Janes	Page 42
Ann Bradley	Page 45
Jesse Purvis	Page 50
Liz Garland	Page 54
Reporter's Certificate	Page 60

INDEX

INDIVIDUAL SPEAKERS:

Charles Armstead	Page 5
Tom Boggs	Page 8
Mindy Armstead	Page 11
Eli McCoy	Page 16
Lisa Burgess	Page 21
Randy Maggard	Page 24
John Hill	Page 27
Joyce McCune Gentry	Page 30
Jason Bostic	Page 32
Randy Boyd	Page 36
Jennifer Boyd	Page 40
Margaret Janes	Page 42
Ann Bradley	Page 45
Jesse Purvis	Page 50
Liz Garland	Page 54
Reporter's Certificate	Page 60

CHAIRMAN SNYDER: Good evening, welcome to the public hearing this evening. We will just do a brief introduction. I want to introduce the Board members who are here. I think probably most of you know the Board members, but I'll start to my far right, your left.

Ted Armbrecht from Charleston; next to him, Dean Cameron Hackney from West Virginia University; next to him Doctor Bob Jenkins, Emeritus, West Virginia University; Melissa Carte, Clerk for the Board; Rebecca Charles, our attorney; Libby Chatfield, our technical advisor. I'm Ed Snyder, Chair of the Board, down from the Eastern Panhandle.

This evening, we've convened to hold a public hearing on proposed revisions to water quality standards rule. Revisions, as most of you know and have participated in, have been developed over the past several months as we've conducted our triennial review of standards. This is required by the Clean Water Act.

Notice of the hearing was publicized according to state requirements and the proposed revisions were made available through our website, and I hope you all accessed them through that.

We'll be taking comments from those who would like to give comments. We have a sign-up sheet here, and what I'm going to do is go down the sign-up sheet. You have - I'm

looking at the number of people who want to comment, the number of people here - three to five minutes maximum.

Ms. Carte, if you would be our timekeeper, and when Melissa gives me the high sign, if you're at five minutes - the evil eye - I will stand up at that point, you sit down, but five minutes hopefully will be adequate. And, again, we'll go ahead and get started.

DR. HACKNEY: Do you want to point out that written comments can be as long as -- written comments can be as long as you feel is needed.

CHAIRMAN SNYDER: Right, and we have -- yeah, so don't feel that it's required to read through all of your written comments. We really do read all of the written comments and discuss them and comment on them as a group when we will convene on the 10th of July.

DOCTOR JENKINS: Have we mentioned a deadline for written comments?

CHAIRMAN SNYDER: We haven't. Let's see, that's going to be 5:00 on Monday the 23rd.

MS. CARTE: Yes, next Monday.

CHAIRMAN SNYDER: Next Monday, so 5:00 p.m., whether it's faxed --

MS. CARTE: Received by.

CHAIRMAN SNYDER: -- whether it's hand-delivered, pony

express, it has to be here by 5:00 p.m., and that's our drop-dead deadline. So that gives a little more time to add things to anything that may come to mind after you hear some of the other presenters this evening, as well, which can happen.

All right, let's get started this evening. Charlie Armstead with the West Virginia Chamber. Mr. Armstead?

CHARLES ARMSTEAD: Is this --

CHAIRMAN SNYDER: Please.

MR. ARMSTEAD: Thank you. I didn't know whether it had West Virginia or a cross on the front so...

CHAIRMAN SNYDER: It's honest, it's a West Virginia, it's a nice one so...

MR. ARMSTEAD: My name's Charlie Armstead on behalf of the West Virginia Chamber of Commerce. I appreciate the opportunity to comment on the triennial review proposal. One of the most pressing issues with the proposed changes is a presumption that all waters in the state are stated Category A drinking waters. We understand that some feel they should be able to drink directly from the surface waters, and we agree, with potable filtration systems currently available, you should be able to take an occasional drink from a stream.

However, Category A, human health criteria for organic

contaminants are not based on an occasional drink from a stream. They are risk-based calculated on a 70-year lifetime of use. Also, these criteria limits are based on public consumption after conventional water treatment.

Another issue that we find is that organoleptic standards were inserted into the triennial review. There are several issues with this. One is the organoleptic standards are aesthetic standards and not human health based.

Secondly, we currently have narrative standards for objectionable odor, color and taste, which is organoleptic.

Thirdly, and most grievous, is that the statement is made that organoleptic standards will be considered during the permitting process, where applicable. This statement offers no guidance as to when a permit writer should apply these standards; and, in fact, a permit writer does not -- that does not apply them, could be considered as not fully discharging his non-discretionary duty.

Organoleptic standards may be many orders of magnitude more stringent than current water quality standards criteria. For example, for the phenolic parameter, just pick that one, the EPA standard and the Board's proposed human health based standard is 21 parts per million, while the EPA's organoleptic standard is 20 parts per billion.

One more issue is that the end of tap actual levels taken from drinking water standards were adopted for instream water quality criteria. These actual levels are used to manage potable water in distribution systems. Basically, the water supplier must ensure the metals are not leeching from the piping system. Now they control this by the addition of water and minerals, such as zinc phosphate.

The water supplier is required to measure levels of metals at the furthest reaches of their distribution system. If the level exceeds the action level, then the supplier is required to add an amendment to the water to encapsulate the metals in the piping of the distribution system. There is no feasible way to correlate the actual level to an instream water quality standard. For example, for the parameter of lead, the EPA has no human health based standard. West Virginia has a current standard, which is 50 parts per billion. The proposed standard based on the drinking water actual level is 15 parts per billion.

We believe it is unreasonable to apply the end of tap drinking water standards used to manage conventional treatment of potable water to the potable water quality instream standards.

In summary, industry is not opposed to changes in water quality standards that are supported by sound scientific

reasons for the proposed standards. However, we know the changes in the proposed standards appear to be arbitrary or not based on sound scientific principles. We would appreciate that all the changes be reevaluated and only those that are scientifically defensible be included. Thank you.

CHAIRMAN SNYDER: Thank you, Mr. Armstead. Mr. Tom Boggs?

TOM BOGGS: Good evening, my name is Tom Boggs, and I'm employed by the West Virginia Chamber of Commerce. I'm indeed pleased to have the opportunity to offer comments on the proposals of the Environmental Quality Board to change and expand the state's water quality standards, and these comments are offered on behalf of the over 3,000 members of the West Virginia Chamber of Commerce who represent virtually every aspect of the state's business community.

The Chamber has been an active participant in previous triennial reviews of the Board and has been an active participant in other water quality regulatory initiatives, such as nutrient criteria, design flow, anti-deg, TMDL water quality trading and the development of an alternative iron criteria. But, even in advance of receiving the Board's proposal, the Chamber has worked with other trade associations to be diligent, make a diligent effort to

review the proposals and to understand their relationship to both state and federal environmental policy and to assess the impact of the proposals on the regulated community.

Our efforts have been severely constrained, however, by the sheer volume of the changes proposed by the Board and the extremely short time period made available for submittal of comment, while also the lack of data to support the proposals. The Board has not only failed to address the economic impact of the proposals on the regulated community as required by state law, it has also failed to address the public policy of the State of West Virginia in the development of water quality standards for the state.

The task of reviewing and commenting on these proposals would be difficult under the best of circumstances; however, the Board is advancing them without having resolved such critical issues as the applicability of Category A public drinking water supply use designation to the state streams and without resolving issues related to what design flow should be applied to the various activities.

It is, therefore, virtually impossible to understand the true impact of these proposals on the regulated community and, for that matter, to ascertain whether implementation of these proposals will result in an overly stringent set of environmental regulatory requirements. The

Chamber urges the Board to recognize that the establishment of the state's water quality standards is a matter of greatest significance that needs to be pursued in a careful and thoughtful manner.

To avoid a rush to judgment, we urge the Board withdraw its proposals and to immediately undertake the preparation of supporting materials that would include at least the following requirements: an assessment of which of these proposals must be adopted to prevent interference with properly designated uses as required under the Federal Clean Water Act;

a determination of which streams are properly subject to Category A public drinking water supply use designation; a determination of what design flow will be applied to each criteria, so the impact of each proposal can be assessed and so that we can determine whether the proposals are consistent with the state's policy for protection of public health;

an assessment of the economic impact proposals on the regulated community as mandated by the West Virginia Code; an assessment on how the Board's proposal can be justified in light of applicable legislative policy of the state which provides, and I quote from the Code: It is declared to be the public policy of the State of West Virginia to maintain

reasonable standards of purity and quality of waters of this state consistent with, one, public health and public enjoyment thereof; two, the propagation and protection of animal, bird, fish, aquatic and plant life; and, three, the expansion of employment opportunities, maintenance and expansion of agriculture and the provision of a permanent foundation for healthy industrial development.

The Board is advancing these proposals at a time of extraordinary competition among our states and extraordinary economic pressure on the West Virginia business community. At the same time, the state is dedicating enormous resources to the development of new water quality programs, such as TMDL, anti-deg, water quality trading and other proposals. Proposals such as this one, that are before us this evening, cannot be taken lightly in the absence of proper analysis.

We urge the Board that -- or we urge that the Board conduct the required analysis under the proposals before proceeding further with their considerations. Thank you.

CHAIRMAN SNYDER: Thank you, Mr. Boggs. Mindy Armstead?

MINDY ARMSTEAD: Hi, my name is Mindy Armstead, and I wasn't planning on speaking to the Board tonight. In fact, I was avoiding reviewing the water quality standard final review changes because I just didn't have time in the short

comment period, and I was hoping to pass that off to other people. But, in the course of helping other people in our office today preparing for their comments tonight, I felt compelled to make some comments of my own, so on behalf of myself and the West Virginia Chamber of Commerce, I'd offer the following to you.

Today there were several of us gathered around the desk with the changes and other documents trying to figure out where some of the numbers came from, and we were starting basically with the first number in the Table 8 there was arsenic, trying to figure out where that human health number for arsenic came from. We did figure out where, but we didn't figure out why. And when we were doing this, it became apparent that a document that would explain the rationale for the changes that were made would be extremely helpful to the regulated community to understand why you did these things.

And I understand that, you know, a lot of the discussion goes on in the meetings, but it's not reasonable to assume that the entire regulated community could make it into this room and have, you know, access to those meetings, and the minutes that we did get from you all weren't very clear on a lot of the issues and how things happened.

And, if you would, just bear with me for a minute, and

I apologize for doing this because I've read my own depositions and I know how bad this is, but if you would, just let me take you through one instance of how the regulated community would view this as they begin to review it.

And I want to talk specifically for just one example of what we found today, the adoption of the human health criteria from the MCLs for drinking water - safe drinking water - and their application to the surface water quality standards. And the February 20th meeting was the first comment that we could find that addressed this issue, and it stated that the Board generally adopts the EPA's human health criteria in the water quality standards, which we all know, and the Board adopts the Safe Drinking Water Act for the groundwater standards -- MCLs, which, again we're all familiar with.

Now, the EPA's criteria in their national recommended criteria document is for surface water, and that is for untreated surface water and fish consumption. It's not for tap water. The Safe Drinking Water Act, those standards, the MCLs, are specifically for tap water as it comes into your home, the maximum permissible level of contaminants delivered to a user specifically, so that's the difference right there.

On February 21st, it reiterates that, and, at that time, Ms. Chatfield states that the purposes for the Clean Water Act and the Safe Drinking Water Act are very different, and it's requested that she prepare a memo that explains those differences.

In the March 26th meeting, it states she's working on the memo, and it will be provided at the next meeting. At the next meeting, with no further discussion of the differences between the two, the first criterion is addressed, and that's arsenic, and the Board adopts a ten, the human health standard for MCLs for the drinking water as the ambient criteria for surface water in which we would normally consider to be treatable, okay, with conventional treatment.

The very next thing that is addressed then becomes lead, and, again, the Board adopts an MCL for lead -- no explanation of why this change from what we would consider the appropriate drinking water quality standards.

Yet, the change to these drinking water quality standards for the MCLs is inappropriate for several reasons, but, one of which -- and some of them have already been discussed, but another one which hasn't been brought up is the fact that the water quality standards define Category A as waters which, after conventional treatment, are used for

human consumption, and then a Category C to which these numbers are also applied is for contact recreation.

Tap water has nothing to do contact recreation, so, first of all, if these changes are to be made, that definition needs to be updated so that the definitions for Category A and C are applicable to the tap water, because basically that's what we're doing.

Another thing that jumped out at me when we were looking at these criteria was that we have new total metal standards for arsenic, copper and nickel. Now, I wasn't aware of any movement in the state to go back to total standards, but I'm guessing - I'm hoping - it's a mistake, but it looks like what happens is, that in the national criteria - the national recommended criteria - they have listed numbers for metals in the table and there are examples for water quality standards calculated at a hardness of 100, and the water quality standards in our standards - and it remains, it hasn't changed - for metals, these metals, are based on hardness derived values.

It looks like someone copied the numbers from the examples from the national recommended criteria and put them into our water quality standards without including the footnotes that said, "This is an example based on 100 milligrams per liter calcium carbonate," and it's also a

dissolved standard. There's footnotes on those things that say both of those. Neither of those are included in the recommendations that are proposed in the current revisions.

So that's a big thing. We'd like to know what the intent is. Are we going back? If we are going back to the total standard, that's not an appropriate total standard. There's tests run on total metals to do that. So, anyway, there were several issues like this. There's an error in the selenium value. There's an error in the mercury conversion.

So we would suggest and ask that you would prepare a document that describes the scientific basis for and the rationale for making these changes and then allow again for review of the documents so that we can comment based on your intent rather than trying to ascertain what that might have been. Thank you.

CHAIRMAN SNYDER: Thank you, Ms. Armstead. Eli McCoy?

ELI McCOY: My name is Eli McCoy, and I'm with the consulting firm of Potesta and Associates, an environmental and engineering consulting firm in Charleston, and I appreciate the opportunity to offer comments on the proposed changes in the water quality standards turbidity tonight.

As I consider the current Environmental Quality Board makeup or what used to be Water Quality Board, I do not

believe that any of the Board members were -- or staff were around when the original turbidity standards were being considered. It just so happens that I was.

In July of 1997, when I began working for the Division of Environmental -- or Division of Water Resources, Department of Natural Resources, one of my first project assignments was the pending turbidity issue. After doing some rudimentary research, I told Dave Robinson, who was then Chief of the Office of Water Resources, that the turbidity standard being proposed was impossible to meet.

We then set out to find a way to turn this negative standard into a positive for the state. The connection between non-point source activities and turbidity was obvious even then. It has not changed. We hit upon the idea of using this impossible standard to encourage the utilization of best management practices in agriculture, logging, construction and other soil-disturbing industries. That would be accomplished through the use of an exemption for the standard if best management practices were being followed.

At that time, the coal industry was the only non-point type of industry being regulated as a point source. This industry already had the best management practices in place for all the earth-disturbing industries of the state, and

that was in the form of mandatory permit requirements and performance standards that were spelled out for them.

They had already reached the level of performance where we were hoping to raise the other earth-disturbance activities, too. They had already been held to that standard that we aspired to bring the rest of the industries, too. It made sense to include them in the standard exemption at that time, and I still believe it's the right thing to do.

The mining industry has stricter controls than any of the other non-point activities. They have permit applications that actually require extensive engineering and physical controls, unlike some of the other non-point activities.

You will hear statements tonight about the solids complex, total suspended solids, settleable solids, total dissolved solids and turbidity, and you'll also hear how the Division of Environmental Protection, recognizing the nature of mining activities, has provided for an exemption to the total suspended solids permanent limits during storm events and replaced it with a settleable solids limit, all approved by the Office of Surface Mining.

Some may have concerns over enforcement of permit conditions in the coal industry. There is no other industry

in this state that has the number of inspector onsite hours logged as this industry. This includes facilities that generate hazardous waste, and we are, after all, primarily talking about regulating dirt with the mining industry.

There's also a narrative standard in place that is easily used to accomplish the same thing. That allows enforcement, even with the exemption in place. There are statements as to objectionable color, excessive solids, floating materials. All those are in the standards and can be enforced, even with -- against the facility, even with the exemption in place.

Removal of the exemption will not result in any overall improvement in water quality. I prepared some containers to show you a little bit about what we're talking about. Vanna, would you give me - show me the 10? Why don't you put it on the table there. (Indicating) This is a 10 NTU value, and if you look at the standard that we have in place, that's what one could add to the water column - to the existing water - if it were below 50 NTU, so let's say we had a 20 -- well, let's say we had a 10 in the stream. We could add 10 more. Those are virtually indistinguishable. It's a visual standard that really doesn't play that well when you try to distinguish it.

Let's go to a different one here. Let's go to one

above 50 and we'll use the 250 standard, and those are nephelometric turbidity units. With that one, your standard really comes out to be that you can increase it by 35 NTUs. Show us 35, Mindy. And that brings it up roughly to the -- to a value of 285 NTUs. And, while you can distinguish the 35 from those, those other two are really fairly close. The point is, it's a visual standard. I wanted to give the Board sort of a first-hand look at what we're actually talking about with the implications of those standards. I brought these props for just that purpose.

Our surrounding states also have not seen the need, for the most part, to develop and implement a turbidity standard. Maryland is an exception. Maryland does have a turbidity standard in place. The existing language and turbidity standard was developed to encourage the use of best management practices.

We have 30 years of - since the passage of the Clean Water Act - a public policy to encourage best management practices, and 20 of those years have relied very extensively on the turbidity standard as a tool to encourage best management practices. We should not consider reversing that 20 years, 30 years of public policy without a great deal of thought and examination. It should not be done lightly.

In closing, I encourage the Board to keep the exemption in place for the coal industry. As an industry, they have done more to institute solids controls and sources leaving their sites than the other non-point activities. They should not be punished for their superior level of performance in this area. Thank you.

CHAIRMAN SNYDER: Thank you, Doctor McCoy. I was wondering what was in the box. I was a little concerned.

MR. McCOY: You were worried it was going to be alive; right?

CHAIRMAN SNYDER: It might have been. Lisa Burgess?

LISA BURGESS: I'm Lisa Burgess with Potesta and Associates, and I appreciate the opportunity to speak to you this evening. My remarks are also in response to your request for comments and suggestions on the proposal to remove the exemption to the turbidity standard for mining activities.

I would suggest that you keep this exemption in place. Turbidity is not a pollutant. It's only an indicator of the potential presence of pollutants. The health and environmental effects often attributed to turbidity are actually due to solids in the water quality. The turbidity level of health concerns associated with raw water used for drinking water supplies are actually due to the presence of

suspended, organic and inorganic materials that provide a haven for microbes and shield them from a disinfection process.

Gill clogging and abrasion in fish is caused by suspended solids, not by turbidity. Reproductive declines in fish through egg or fry mortality are not caused by turbidity either, they're caused by siltation. In benthic macrovertebrates are smothered or starved by solids that settle on the stream bed, not by turbidity. Turbidity is actually a measure of an optical property of water where light is scattered and absorbed rather than being transmitted. It's a qualitative measurement, and it can't be assigned a mass, and many substances present in our surface waters can cause this effect.

Some of these substances, like suspended clay, silt and other inorganic solids, are pollutants that can cause harm to the aquatic environment, and they should concern us. Some of these materials come from earth-disturbing activities that include construction of things like shopping malls, hospitals, schools, highways and coal mining activities.

Other substances that contribute to this light scattering effect in water are finely-divided organic matter, color-inducing substances, such as tannins that

leech from leaf litter, plankton and other microscopic organisms that are naturally occurring and necessary to the balance of the aquatic ecosystem.

The agents of harm to the aquatic environment coming from earth-disturbing activities are solids. We have commonly available analytical tools that can check for these substances. Total suspended solids analysis is a measure of the dry weight of solids present in a sample of water after it's been run through a filter. It's expressed in milligrams per liter.

Settleable solids analysis is a measure of the volume of total solids that will settle in the bottom of a cone-shaped apparatus called an Imhoff cone" in a 60-minute period. Settleable solids are expressed in milliliters per liter. Unlike turbidity analysis, both of these are quantifiable procedures that produce practical estimates of the amount of solids present in a given sample.

The good news is that the coal industry has NPDES permits that specifically contain permit limits that are enforceable for solids, total suspended solids and settleable solids. Turbidity is a test that has historically been used to indicate the presence of solids because it's cheap and easy, especially when compared to conventional solids analysis.

The problem with using turbidity as a water quality standard is that it does not tell us that the cause of the turbidity reading is actually a pollutant or if it should be a source of concern.

In conclusion, I can only say that it would be terribly ironic if coal were to lose this exemption, because the coal industry is the only earth-disturbing activity that actually has enforceable controls and permit limits that take care of the discharge of solids that would be indicated by turbidity. Thank you.

CHAIRMAN SNYDER: Thank you, Ms. Burgess. Randy Maggard?

MR. MAGGARD: I also brought some props. I thought I would need an easel, but I think I'll be fine without it. Here's some copies I'd like to pass around that represent some of the items on the table here.

My name is Randy Maggard. I'm with Argus Energy. I'm also President of the Twelve-Pole Creek Water Association. I have approximately 25 years experience in water monitoring and intimately involved with all these things we're discussing regarding turbidity.

The one issue that's been brought up is the issue of settleable solids. There seems to be this misconception that solids discharged from mining operations are not

controlled, but, in all cases, and I'll illustrate this a bit further, is that practically in all cases, you have to monitor settleable solids from your discharges.

This is the Imhoff cone that was previously discussed. This is the apparatus that's used to measure settleable solids. You put approximately one liter - here's the one liter mark - in the Imhoff cone. You put it in a stationary device, let it sit for one hour, then you measure how much the settleable solids limit is. This is the enforceable settleable solids limit on all mining operations, .5 milliliters. That's how much has to come out during a one-hour period. It's marked on here. So you can see that the water really has to be fairly turbid or again - excuse me for using that term - full of suspended solids to be able to -- or it would be fairly clean to put you in violation.

Now to go back, I know that some of you all have probably seen these, but a lot of people might not have. This is actually a page out of an actual NPDES permit for a mining operation, and you can see that they have various categories here, dry weather, DCP, one year, two year and ten-year storm events. DCP is pretty self-explanatory. That's a discharge caused by precipitation. Dry weather's pretty self-explanatory. Now, some people consider dry weather something we haven't had in a long, long time. Dry

weather, regulatory-wise, is 24 hours after the cessation of a rainfall event. It's, you know, 25 hours after it quits raining, it's considered to be dry weather.

Now, when you go through this, you can see there's variations here for different types of discharges, but practically all mining discharges that are below preparation plants, refuse fills, slurry impoundments and valley fills are instream ponds which are assigned water quality based effluent limits. Now, water quality based effluent limits, you've got a total suspended solids value that has to be measured during a dry weather event, but anything from a DCP all the way up to a 10-year or 24-hour storm event has to meet settleable solids criteria, which is the .5 milliliters.

And I'd like to explain that where this permit is held in Wayne County, a one-year storm event is 2.42 inches in a 24-hour period. A two-year is a 2.74 inches in a 24-hour period, and a ten-year is 3.95 inches in a 24-hour period, so you have approximately 4 inches of rain in a 24-hour period, and this mining company is still having to meet a .5 settleable solids limit.

So there seems to be a misconception that mining companies do not control settleable solids. We have multiple facilities constructed. They have to be designed

by a professional engineer. They have to be certified by a professional engineer. They're also monitored bi-monthly. We're required to sample these. The DEP inspectors sample these, so there's lot of enforcement potential to make sure that the mining companies adhere to this.

So, in conclusion, I think that the addition of a turbidity standard would be extremely cumbersome upon the industry and in the regulatory community and also would not solve -- not provide for any more additional environmental protection. Thank you.

CHAIRMAN SNYDER: Thank you, Mr. Maggard. John Hill, please?

JOHN HILL: Good evening, I'm John Hill. I chair the Water Team for the West Virginia Manufacturers Association. The Manufacturers Association is pleased to have this opportunity to offer comment to the Board and appreciates this opportunity to put forward to the Environmental Quality Board several specific items for your consideration.

The first has to do with trout streams. There is no information put forth by the Board that supports the conclusion that any of the 400 streams proposed to be designated as trout streams meet that definition. On the contrary, the Manufacturers Association understands that the streams listed are those to which trout have been stocked in

order to provide trout fishing in streams which predominantly do not naturally support the trout population.

Applying this designation to streams not deserving will inappropriately restrict the use of those streams. There should be an affirmative determination by the Board that a stream meets the definition of "trout stream" before being so designated.

Organoleptic effect criteria. The organoleptic criteria deal with aesthetic issues - taste and odor - and are often, as indicated, orders of magnitude more restrictive than necessary to protect human health. These criteria should not be incorporated into West Virginia water quality standards without both, number one, listing the specific values that will be imposed. The current reference is just to another document over which the Board had no control, to elicit the actual values being proposed.

Second, is to clearly, very clearly, define conditions under which these specific criteria would be applied. Until both of these are established, the true economic impact of this criteria, which the Manufacturers Association believes to be very substantial, cannot be determined.

Third, the appropriate stream flow for assessment of carcinogens. The EPA values for concentrations of carcinogens proposed for inclusion in the water quality

standards provide a protection factor of 10^{-6} when applied to the harmonic mean flow of the stream. The use of the 7Q10 flow with these values intended for other flow rates results in excessive costs and discharge restrictions that exceed those necessary to meet this well-established and understood protection factor of 10^{-6}.

The Board should support using a harmonic mean flow when determining limitations for the carcinogenic compounds; or, in the alternative, actually increase the values appropriately that would be elicited for carcinogens in the Appendix E.

The Manufacturers Association does not understand the motive for removing the list of known public water supplies. If the Board wishes to indicate that there is no need to list drinking water supplies because all the streams are presumed to be drinking so designated, then really the Board must propose an amendment to the water quality standards to assign drinking water use throughout the state.

The Manufacturers Association continues its opposition to designate all state waters as Category A as unwarranted and inappropriate.

And last, but certainly least, the assertion that the proposed rule will have no cost or other economic impact should based on a thorough assessment that is required by

West Virginia Code. It is the duty of the Board to determine the impact of the proposal on employment, agriculture and industry, not the duty of the affected parties. No assessment has been performed and the assertion of no significant cost or economic impact is at least premature and, the Association feels, probably invalid.

Again, I appreciate the opportunity to supply comment. The Association looks forward to the Board's reconsideration of the proposal in these areas, especially those areas that, without substantially improving environmental quality, can adversely impact business opportunities in West Virginia. Thank you.

CHAIRMAN SNYDER: Thank you, Mr. Hill. Joyce McCune Gentry, please?

JOYCE McCUNE GENTRY: Good evening, my name is Joyce McCune Gentry. I'm speaking -- I'm employed by Acacia Environmental Group here in Charleston, West Virginia, and Acacia has been hired by the West Virginia Chamber of Commerce and other trade organizations to conduct thorough technical analysis of the proposed changes to the West Virginia water quality standards.

I am pleased tonight to provide some brief comments on those standards. Our comments tonight will focus on the use of harmonic mean flow versus 7Q10 flow for carcinogenic

compounds. As everyone knows, the criteria for carcinogens are based on increased cancer risks of one per one million population over a seventy-year lifetime.

If you go into the guidance document, which is USEPA Technical Support Document for Water Quality Based Toxics Control, which was published in March 1991, you will find that everything is referenced to harmonic mean flow. Further, when you read through that document, it specifies that harmonic mean flow should be used. If it's not available, then 7Q10 flow can be used, but they recommend multiplying the 7Q10 flow by a factor of three. They say this is based on a sample of sixty streams. They went through and analyzed, and, of all the streams, all of them were at least 40 percent greater than the 7Q10 flow, the harmonic mean was.

They also -- some of these trends vary. So, it could be anywhere from two and a half to three and a half times higher. This means that our current standard is two and a half to three and a half times more stringent than the EPA recommended criteria.

Further in the document, it recommends that, if you do not know the harmonic mean flow and you do have a 7Q10 flow, you should use a factor of -- multiplying factor of three to adjust the flow or to adjust the criteria.

We believe that there are two options the Board has, that the Board can either adjust the criteria to reduce -- to increase the stated numerical criteria to reflect three times 7Q10 or they can adopt harmonic mean. I went through a couple of examples. I pulled out benzene and phenol. If you use the example of phenol, the current proposed listing is 2.2 parts per billion. That would increase to 6.6. Basically, this maintains the 10^{-6} cancer list factor if you pull in 6.6 part per billion.

If you look at -- then if you look at phenol, the current level is 21 parts per million. If you take the three times factor, that would be 63 parts per million. This still maintains the 10^{-6} risk factor. This comment is based on the fact that current West Virginia standard states that we will maintain a 10^{-6} risk factor.

In conclusion, the Board has two options: they can use harmonic mean flow for carcinogens or they can adjust the criteria to continue using 7Q10. Any other options will cause the Board to violate its own guidelines. Thank you.

CHAIRMAN SNYDER: Thank you. Jason Bostic?

JASON BOSTIC: Good evening, I am Jason Bostic with the West Virginia Coal Association, and I would like to first thank the Board for the opportunity to comment on these proposed revisions to the West Virginia water quality

standards.

Of the proposed revisions, one in particular is of great concern to the coal industry, turbidity. Other more qualified technical speakers have already described the science behind the turbidity criteria, explained the coal industry's stringent NPDES permit requirements and detailed how the mining industry addresses the parameters of concern for which turbidity is an indicator.

Now, I would like to explain to the Board why deleting the industry's exemption is such a great concern to the members of the West Virginia Coal Association, which account for 98 percent of the mountain state's underground surface coal production. Removal of the coal industry's exemption will impose a standard that exists only in West Virginia and one that is impractical and offers no tangible environmental benefit.

As many of you know, coal mining is an extremely competitive business. It's competitive on the state, regional, national and global level. For consumers, this is a great thing. The goods produced from coal, which range from cosmetics to steel and include the majority of the nation's electricity, costs less because of the market pressures exerted on the coal producers.

This intense competition also makes markets extremely

sensitive to changes, especially changes that are confined to a particular state or region. In other words, if an action more than increases the cost of coal production in a particular state or region, it will quickly lose its market shares to other producers in other regions.

The coal industry in West Virginia has already overcome monumental challenges to ensure that coal mining continues to be a viable undertaking in West Virginia. Coal mining is more difficult in West Virginia and Appalachian than it is in other regions. The terrain is steep and transportation is restricted.

To compensate for geology and other competitive disadvantages, the West Virginia coal industry has increased productivity, introduced capital intensive and efficient mining methods and hired the most highly-skilled and trained industrial work force in the world.

In short, West Virginia has satisfied the burdens imposed by the market. We have compensated for our geologic and geographic disadvantages with technology and professional coal miners. Forces independent of the energy market, mainly government policy and regulation, also present formidable barriers to West Virginia's most abundant energy resource by increasing the cost of coal production. The coal industry is perhaps the most regulated industrial

activity in the nation and is by far the most regulated business in West Virginia.

In order to mine and process and ship coal in West Virginia, an operator must obtain several permits, several state and federal permits. And, although West Virginia is not unique in this aspect, other mining operations across the nation must have similar permits, actually getting a permit in West Virginia is more difficult and costly. The various regulatory programs in place in West Virginia contain requirements and controls that far exceed those in place in other states or on the federal level.

I will refer you to a document that is included in your folders labeled "Statutes, Rules and Policies that Exceed Corresponding Federal Requirements." The cumulative impact of layers of restrictive only in West Virginia rules -- only in West Virginia rules and policies is placing West Virginia coal at a competitive disadvantage as you will also see from your other handouts in the folder. Permitting a mining operation takes twice as long and costs twice as much here in West Virginia as it does across the Tug Fork River in Kentucky.

Other evidence of the suffocating effects of over-regulation are found in a recent -- in the recently released surface mining environmental impact statement. An economic

examination of the coal industry commissioned by the Federal Environmental Protection Agency concluded and I quote, "There is clearly developing definite reluctance to invest in this area due to the perception of a hostile regulatory environment."

I would urge the Board not to remove the coal industry's turbidity exemption and to not impose another requirement that is found only here and imposed only on the coal industry. Thank you.

CHAIRMAN SNYDER: Thank you very much, Mr. Bostic. Let's see, the next speaker would be Randy Boyd, please?

RANDY BOYD: I've got some handouts for you here. I'm Randy Boyd. I'm a member of the Plateau Action Network located in Fayette County. We're a non-profit citizens group dedicated to sustainable environmental management and economic development. I'm also here on behalf of the Fayette County Water Quality Coalition, which is a group of businesses, healthcare professional, environmental groups, county officials and the West Virginia Professional Rafting Outfitters.

The Fayette County Water Quality Coalition understands the importance of wastewater infrastructure to the health of its economy and clean water to the health of its residents and the tourist industry. In the last year, Fayette County

Water Quality Coalition, along with PAN's help, has gotten a $400,000 direct appropriation from Congress to create a county-wide wastewater - comprehensive county-wide wastewater plant.

We've also got another $2,000,000 to improve wastewater infrastructure, and we appreciate the opportunity to comment, but we're here to oppose the changes to the fecal -- the proposed fecal coliform standards. These proposed changes, if you read them, what they say is, you first of all test for fecal coliform, and then, if you get a violation -- if you get a violation of what is the current standard now, you have to go back and test again, and you test for E. coli, and only then if the E. coli standard -- if the E. coli test is above the standard, do you have a violation.

The problem with that is that you go out and test for fecal coliform and maybe you catch a plume that day from a wastewater treatment plant bypassing, and, you know, maybe you get a number of 60,000, and I've seen numbers in the hundreds of thousands. You take that to the lab. You get it back maybe if you're lucky the next day, maybe three days later, maybe five days later and then you -- nothing requires you to go out and test for the E. coli violation; but, if you do go out and test for that E. coli violation,

the conditions have changed, and, you know, chances are you're not, you know, you may catch that plume, you may not.

Included there you're going to -- I'm going to give you an example. Now, I'm a special ed math teacher in high school, but I've got -- what you've got here is spill data report. If you look at this spill data report, you're going to find that on Piney Creek alone, there were 60 bypasses of wastewater treatment plants in one year due to rainfall, 60. I'm going to quote the DEP here: "The City of Beckley alone bypasses literally hundreds of millions of gallons of raw sewage into Piney Creek each year."

So, you've got 60 bypasses in a year. That's 60 out of 365 days. Theoretically, you've got a one out of six chance when you go out there and test for fecal coliform of finding a violation. And, by the way, the National Park Service -- the National Park Service has documented high fecal counts and E. coli counts in this stream during rainfall events corresponding to these bypasses.

These bypasses are episodic and may last anywhere from several hours to usually no longer than a day. So 60 days, 365 days, you've got basically a one in six chance under the current standards.

Now, if we go under these new proposed standards, you go out there one day and test for fecal coliform, get a one

in six chance. Let's say you catch one of these bypasses and you get 50,000, 60,000. Okay, you would have a violation under the current standards.

Under the proposed standards, you have to go out -- you go out that one day, you have a one out of six chance of getting a violation of the fecal coliform standard, but in order for it to be a violation, you have to go out a second day. Now, that second day might be the next day or three to five days later. When you go out that second day, you still have a one out of six chance of catching one of those plumes.

However, to catch that plume two days in a row, one-sixth times one-sixth, it's a basic law of probability, it's one over -- it's -- you have a one out of thirty-six chance of getting a violation under the new proposed standards. Under the old -- under the existing standards, you have a one out of six chance, and that's not fair.

As a result of these new standards, it would be difficult to prove all but chronic violations. Therefore, the impression will be that water quality has greatly improved when it has not. Therefore, there will be no incentive to improve water quality through funding wastewater improvements. The state's estimated two billion dollar need to bring adequate sewage to its residents has

just been considerably decreased, not by a real improvement in water quality and sewage treatment, but by a test that uses smoke and mirrors to deceive its citizens and hundreds of thousands of tourists. I've got -- is my time up?

CHAIRMAN SNYDER: Time's up, just a quick conclusion if you would, please.

MR. BOYD: Okay. The other thing is the new standards, they define sail boating and motor boating. There's hundreds of thousands of people in West Virginia that kayak, raft and canoe, and that's not included, and we would like that included. Thank you.

CHAIRMAN SNYDER: Thank you, Mr. Boyd. Jennifer Boyd, please?

JENNIFER BOYD: Hello, my name is Jennifer Boyd. I'm the Medical Director of New River Health Association, which is a primary care health center in Fayette County, West Virginia, and I'm here to share with you comments from my colleagues - my provider colleagues - about the proposed changes related to the fecal coliform standards in the triennial review.

As members of the New River Health Association Clinical Provider Group, we would like to provide comments opposing the proposed changes to the fecal coliform standard for contact recreation. We find two weaknesses in each of these

proposals. Using a -- first of all, using a single sample for fecal coliform followed by an E. coli test is not possible because the water sample would be too old for accurate testing after the fecal coliform tests are performed to accurately assess the E. coli test.

Secondly, elevated levels of bacteria from sewage overflows are episodic, and therefore any tests for E. coli which follow a fecal coliform test with criteria violations may not reflect similar conditions. This leaves violations undetected, unreported and poses a potential risk to human health.

Fecal coliform is critically important -- a critically important standard related to public health. A valid bacterial standard is important in protecting all of West Virginia's citizens who use and recreate in our waters. A single weekend epidemic of salmonella or camphylobacter could have serious health effects on those citizens if undetected.

According to the Center for Disease Control, the CDC, and this is a quote, "The most frequent water borne disease illness reported is gastroenteritis," unquote, yet, more serious diseases can occur from exposure to bacterial infected waters. The CDC reports that, quote, "During 1997 to 1998, four deaths were caused by primary amebic

meningoencephalitis. This is from water could enter a person's body through nasal passages when water is forced up the nose." While this is a rare example, it does illustrate the potentially serious effects of water borne diseases.

We urge the Board to reconsider this provision related to fecal coliform testing and to institute standards that are more protective of the public health and are scientifically sound.

CHAIRMAN SNYDER: Thank you, Ms. Boyd. Margaret Janes, please?

MARGARET JANES: I'm Margaret Janes, and I represent the Appalachian Center for Economy and the Environment. We've already submitted written comments, but we're going to comment just on a couple of things today, and we appreciate the opportunity.

First of all, I'd like to thank the Board for adding to the B2 trout list. These streams have an existing trout use, and officially designating them as a trout water can only solidify the protection that the Clean Water Act provides for existing uses. We sincerely appreciate this and thank you for that.

The rest of my comments are related to the proposed changes to the bacterial criterion. We urge that the newly proposed language be dropped. The modifications that have

been newly proposed are vague. We feel they undermine the existing fecal coliform criterion. They're subject to multiple interpretations, and furthermore they're impossible to legally implement.

What we suggest is, is that you leave the existing fecal coliform criterion intact and, over the next year, closely cooperate with the DEP - that's typical for this Board anyway - and work on finding a fair and reasonable transition to the E. coli criteria. We suspect that that transition's going to take two or three years. Without that kind of thoughtful transition, impaired streams, TMDLs, water quality limited segments, ongoing enforcement actions and protection of basic stream uses is jeopardized, so we ask you to try to make a transition period as seamless as possible. It's a tough job, but it can be done.

There's a couple of things that EPA has suggested in their recent implementation guidance. One is to run both standards simultaneously and the other is to simply set a date at sometime in the future where that transition's going to take place.

The language that you have proposed, if it's read, just plain English, just straightforward interpretation, says that if a fecal coliform violation is found, then the same cup of water - the same sample - has to be run for an

E. coli test, and that test will either confirm or disprove that violation. The problem with that has already been pointed out, is that by that time, by the time you get a result, which is at a minimum going to be 32 hours, the sample will simply be too old to test. Therefore, it will be impossible to comply with EPA's testing and handling requirements.

The other interpretation is that if a sample violates a fecal coliform test, then another water sample can be taken at some other time. And when that sample would be taken or who would take it or the flow rate that it would be taken at is strictly up to the sampler's discretion, which basically puts the sampler in the driver's seat. The sampler is in a position to relegate a standard that you have promulgated, that the legislature has approved and that EPA has approved, and make it nothing more than a screening tool for their own standard.

As has been pointed out, fecal coliform and E. coli, all the bacterial elevations are extremely episodically dependent on the flow rate, the environmental conditions that are right there at the time that sample is taken. The circumstances of that original violation are going to be lost. They will never be repeated again. That's just the nature of the beast. Thus, basically we are giving

violators a "get out of jail free" card every time there's a fecal coliform, and the people who have the money to take those additional tests can do it to disprove the original violation.

I think we all know that fecal coliform is one of the most straightforward standards in this state. It simply says you shouldn't have too much manure in the water. You can't get plainer than that. I live in the Potomac headwaters. We've had ongoing fecal coliform problems. I have friends who have been in the hospital with GI disease. People are getting skin infections, ear infections continually. This is an important standard, and it's one that has to be protective, not only of the citizens of the state, but of the industries - the tourist industry - that rely on clean water.

We ask the Board to reconsider this provision. Thank you.

CHAIRMAN SNYDER: Thank you, Ms. Janes. Ann Bradley, please?

ANN BRADLEY: Good evening, my name is Ann Bradley, and I'm with the firm of Spilman, Thomas and Battle, and I've been asked to give these comments tonight on behalf of Jeff Stevens, who's the Chairman of the Environmental Committee for the Independent Oil and Gas Association of West

Virginia.

A part of IOGA's mission is to protect and improve both the business and natural environment of our state. To that end, IOGA has worked closely with the WVDEP and that agency's office of Oil and Gas to ensure the application of reasonable and effective environmental regulatory requirements to oil and gas operations.

Although IOGA will be providing written detailed comments on the proposals to the Board, we'd like to address certain of the more specific proposals this evening.

Number one, we are concerned that the Board is rushing forward unnecessarily in proposing changes to so many criteria at this time. As we understand EPA policy, the Board is only required to propose standards for those pollutants where available information indicates that the pollutants are present or discharged in state waters and that those pollutants can reasonably be expected to interfere with designated uses.

IOGA supports the use of a three-step approach to the valuation of new criteria. First, the Board should determine whether, on the basis of available information, such pollutants are present or are being discharged in state waters.

Second, if the finding of the first step is

affirmative, the Board should then determine whether these pollutants are present in concentrations that can reasonably be expected to interfere with designated uses.

Third, if the second step yields an affirmative finding, then the Board should determine whether the national criteria should be applied or whether there is some derived numeric criteria consistent with the Clean Water Acts that would be appropriate for the protection of state water uses.

Just as Governor Wise and Secretary Timmermeyer have urged the Board to act deliberately and with caution in the adoption of the harmonic mean flow and the Board has embraced that approach, we urge the Board to show the same caution and act with deliberation in determining when and whether new criteria are necessary for the protection of West Virginia's waters. We believe the impact to the regulated community from the blind adherence to EPA's national criteria will be enormous.

Number two, IOGA is concerned with the Board's proposal to reduce by 500 percent the Category A and Category C criteria for arsenic. The proposal would impose the end of tap drinking water limit for arsenic that has been established under the Safe Drinking Water Act. However, in adopting that standard, EPA has provided states at least

four years before they are required to demonstrate compliance with the new arsenic standard at the drinking water tap. The Board's proposal would apply that standard immediately to rivers in West Virginia.

We continue to be troubled by the concept of requiring West Virginia businesses to discharge wastewater that is as clean as tap water. However, in addition, we believe EPA would have allowed a four-year compliance period on the assumption that water systems were not capable of treating the level imposed by the new standard immediately. For these reasons, we urge the Board to postpone taking action on the new arsenic criteria for Category A and C.

Number three, IOGA supports the proposed change to Section 8.32.1, which would reference the state's Non-point Source Management Plan, as issued by DEP in December 2000. Guidance on the appropriate BMPs to be used at oil and gas operations has been issued by the DEP's Office of Oil and Gas. The control of surface run-off from oil and gas activity has been effectively and efficiently addressed through the use of these BMPs. We support the recognition of the use of such practices under the turbidity criterion.

Four, the proposed rule would significantly expand the list of trout waters which currently appears in Appendix A. We are concerned that the Board's proposal to add hundreds

of new streams to the trout water criteria in this single ruling, with a public review period of only 30 days, does not allow sufficient opportunity for concerned members of the public to have meaningful comment on this proposal. Again, we urge the Board to adopt a more deliberate approach on this issue. In particular, we recommend that the Board consider providing notice of its proposed actions in the area where the potential waters are located to ensure that members of the public have a meaningful opportunity to address this proposal.

Finally, the Board has proposed to delete Appendix B, the designation of specific public water supplies, from the water quality standards. IOGA opposes this approach and believes that it would be meaningful if the Board would seek to update this appendix rather than to delete it.

We appreciate the opportunity to provide these comments to the Board. We also want to thank the individual members of the Board for their dedication and hard work. Thank you.

CHAIRMAN SNYDER: Thank you, Ms. Bradley. I'm going to go down the list. There are no yeas or nays for some folks, so I'll just see if you want to present. Larry Emerson?

LARRY EMERSON: I would like to defer, Mr. Chairman.

CHAIRMAN SNYDER: Okay. Thank you, Mr. Emerson. Dan

Ramsey is running out, okay. Was it something we said?

DAN RAMSEY: Not at all.

CHAIRMAN SNYDER: Jess, is it Purvis?

JESSE PURVIS: Yes. My name is Jesse Purvis, and I'm here tonight as a representative of the National Park Service for the three river-based park units in southern West Virginia, New River Gorge National River, Bluestone National Scenic River and Gauley River National Recreation Area, and we're concerned primarily tonight about the proposed changes in the fecal coliform standard that's already been addressed by several other people here.

And, so rather than go over a lot of what they have already said, I'd just like to say that that material that they have quoted is accurate, and we do have some concerns about the wording in there, the confusion and the ambiguity, and I just want to give a couple of examples here.

First, the 24-hour incubation time required for the fecal method does not allow the original sample to be reliably tested for E. coli for any standard methods. Microbiological samples have to begin processing within six hours of sample collection.

Second, allowing further testing to determine compliance delays, reporting of non-compliance by at least

48 hours and, in most cases, 72 hours due to that 24-hour incubation time and also by travel time sometimes to get the samples.

We collect and analyze samples for fecal coliform bacteria from approximately 40 sites over a four-county area that encompass the three parks. So due to travel times, sample processing requirements and all the things that go along with it, sampling of all these sites takes six different sample runs for us to complete.

And just on one run, say we collect a sample at 9:00 on Monday morning and get it back to the lab and begin processing by 2:00 in the afternoon, and that's pretty optimistic a lot of days, results are not going to be available until at least 3:00, more likely 4:00, the next day. Because it's now too late to collect additional samples from that site and begin the processing on Tuesday, the subsequent sample to determine non-compliance cannot be collected until at least Wednesday, and the results will not be available until at least Thursday, so it allows all that additional time in there.

Additionally, monitoring by the Park Service and numerous other agencies has shown that sewage pollution in running waters is highly dependent on hydrologic regime. Usually, this is manifested by higher fecal densities being

associated with higher stream discharges. However, this relationship is not linear.

For a given discharge, fecal densities are usually higher on the rising limb of a hydrograph as the water comes up and lower on the declining limb. Rising limbs rarely last for more than a few hours on small streams, and even on large rivers, it rarely lasts for more than one day. Therefore, returning two days later or even one day later to an area that exhibited non-compliance will not be sampling the same conditions again.

I have some examples here of hydrographs I pulled a few off the USGS's website today, but I will include those in our formal comments to the Board.

Also, third, the Park Service is concerned that the perception -- about the perception that using a proposed standard to determine non-compliance will have on the water quality in West Virginia and especially in the above-noted three park units that receive heavy recreational use.

It appears that the proposed standard will result in reduced incidences of non-compliance. This may lead to the perception that water quality is improved, even though there has been no real improvement in water quality. If this false perception persists, there will be less incentive to improve water quality. The EPA has long recommended that

states use E. coli or Enterococci as the standard for determining sewage pollution for contact recreation, reference included.

This recommendation was based on a higher degree of correlation between results obtained by these methods and the incidences of gastrointestinal illness by water contact recreation exposed to various levels of microbiological contamination. More recent studies have supported this opinion. That's the draft implementation guidance for ambient water quality criteria for bacteria. This later document also provides EPA's recommended approach, which was mentioned by another speaker earlier, for states making a transition for fecal coliforms to E. coli and/or Enterococci.

Finally, the National Park Service suggests that the Environmental Quality Board work towards adopting the E. coli standard as presented by the USEPA. An acceptable alternative might be to modify the proposed standard to one that allows the use of either fecal coliforms, E. coli or Enterococci according to the appropriate EPA and standard method guidelines for each method. Thank you.

CHAIRMAN SNYDER: Thank you, Mr. Purvis. I'll go down the list. Anne Blankenship, would you like to speak?

ANNE BLANKENSHIP: No.

CHAIRMAN SNYDER: Okay, thank you, ma'am, and actually the last person, Calbert Armbrecht?

MR. ARMBRECHT: No.

CHAIRMAN SNYDER: Okay, and the last person on the list, Liz Garland, who indicated that would like to speak, although we will open this up for anyone who hasn't spoken who would like to after Ms. Garland is done.

LIZ GARLAND: I am Liz Garland, with West Virginia Rivers Coalition, I'll say last but not least in this particular case. We are submitting written comments, so I will try and bullet through some of those comments and hit on a few key points.

To begin with, it is West Virginia River Coalition's conviction that exemptions from water uses that provide protection to human and aquatic health are not a good practice. If Weirton Steel had invested adequate time negotiating with the City of Weirton over the last six years, they would not need exemption from public water supply protections. WVRC believes extending Weirton Steel's exemption another seven years until September of 2010 is nearly the same as providing the permanent exemption that was arduously objected to by many citizens and organizations in a previous hearing and ruled against by the EQB. A more progressive timetable toward a final solution of Weirton's

need for exemption is overdue.

Next, I'd like to discuss trout waters. Rivers Coalition appreciates the efforts of the EQB working with the staff of DEP and the Division of Natural Resources to review and update the list of streams eligible for protections provided trout waters under Category B2 trout waters, Appendix A. This list should be viewed as a working document constantly eligible for edification and enhancement. Rivers Coalition recommends that the EQB be receptive to additions throughout the triennial review and revisit the list with DEP and DNR staff at the close of each triennial.

Appendix E, water quality criteria. The intent of the EQB to update West Virginia's numeric criteria for water quality parameters to EPA's national recommended water quality criteria of 2002 is consistent with Rivers Coalition's position that standards governing water quality protection in the state be at least as protective as federal guidelines. It should be considered acceptable, even admirable, if West Virginia protects its waters to an even higher standard.

The new pollutants list and Table 1, the comparison chart or Appendix E, move West Virginia parameters to EPA's level of protection with two key exceptions that I'll point

out at this point.

The first is fecal coliform. Fecal coliform parameters are applied for primary contact recreation in a state where recreational contact is a part of its largest growing economic industry, tourism, and in a state which faces enormous infrastructure development challenges, from straight piping to combined sewer overflow failures. Therefore, protections for primary contact recreation are amongst the most important parameters facing this EQB review.

I'd like to reiterate that West Virginia's water quality standards do a poor job of defining primary contact recreation. They do not fully recognize water contact typically encountered by someone recreating in a mountainous state. Whitewater paddlers, boat fishermen, fly fishermen are subjected to more contact than most sailers and motor boaters.

I'm going to skip past on the technical reasoning, which has been extremely well discussed so far, and go on to the fact that West Virginia Rivers Coalition recommends that EQB abandon its present proposal for sequential testing. One consideration may be incorporating a move to both tests over a period of, say, five years. A five-year transition would allow the additional cost of E. coli testing to be

spread out over time, to develop a history of data which would provide comparative data and help deal with those concerns of how to approach things, such as TMDL cleanups based on fecal coliform records; and, three, move to a standard which provides insurance for protections for primary contact recreation in West Virginia.

The second exception I wanted to discuss was turbidity. West Virginia Rivers Coalition believes it is inappropriate to exempt from turbidity standards non-point sources exercising BMPs as measuring practices and sites with surface mining permits.

During the recent months of the triennial review, some comments by the EQB deferred the coal, timber and agricultural industries measure of protection from turbidity to other agency reviews or regulatory measures.

West Virginia water quality standards should be a stand-alone document through which the best protections are provided all of the state's waters. Review, regulation and protection by those issuing coal permits, for instance, should be based upon the foundation of the state's water quality standards and not the other way around.

Excessive turbidity and the resulting sedimentation in streams should be recognized as a broad-reaching problem. Extending exemption of turbidity standards to non-point

activities and permitted surface coal mines places inherent risks on an extensive portion of the state's waters. West Virginia Rivers Coalition believes those risks are not warranted and, to close, Rivers Coalition would just like to thank the EQB for handling this enormous task which we believe protects the rivers of West Virginia. Thank you.

CHAIRMAN SNYDER: Thank you, Ms. Garland. Is there anyone who would like to speak at this time and did not indicate so or have the opportunity? Okay.

Well, let me do just a quick wrap-up. Obviously, we do appreciate your comments. We appreciate you being here this evening and the wonderful comfort that we all experience in this meeting room.

We will continue to receive written comments in the Board office through 5:00 p.m. Monday, 6/23/03. You can fax, e-mail, carry in, however you want to bring them in, but 5 p.m. is the solid deadline. The Board will reconvene July 10th, 9:00, to discuss the comments received, make final decisions on revisions to the proposed legislation.

After Monday at 5:00 p.m. - this is an important note and something to keep in mind - we will not take additional comments from the public on these revisions. This prohibition on ex parte communication is outlined in the State Administrative Procedures Act. The one exemption to

this prohibition is that we may continue to communicate with the state and federal agency staff after the close of the comment period.

Although further public comments and communication on the revisions will not occur, the meeting on July 10th will be open to the public, as always. We always encourage you to attend. An opportunity will be provided by the Board for discussion after deliberations and decisions have been made by the Board, and, again, thank you very much for all coming. We appreciate your time and efforts. We're adjourned.

(WHEREUPON, the hearing concluded at 8:27 p.m.)

REPORTER'S CERTIFICATE

STATE OF WEST VIRGINIA

COUNTY OF KANAWHA, to-wit:

I, Karen R. Meyers, Certified Court Reporter and Notary Public within and for the State aforesaid, duly commissioned and qualified, do hereby certify that the foregoing is, to the best of my skill and ability, a true and accurate transcript of the hearing held in the foregoing-styled matter on the 18th day of June, 2003.

Given under my hand this 23rd day of June, 2003.

Karen R. Meyers

KAREN R. MEYERS, CERTIFIED COURT REPORTER

COMMISSIONER FOR STATE OF WEST VIRGINIA

My commission expires: April 15, 2012.

OFFICIAL SEAL
COMMISSIONER FOR
STATE OF WEST VIRGINIA
KAREN R. MEYERS
140 PETERS DR.
BECKLEY, W.VA. 25801
My commission expires April 15, 2012

KRM

WV Environmental Quality Board
JUNE 18, 2003
PUBLIC HEARING
7:00 P.M.
Sign-In Sheet

NAME:		Speaking: (Y/N)
√1)	Charlie Armstead	WV Chamber (Y)
√2)	Tom Boggs	WV Chamber (Y)
√3)	Mindy Armstead	WV Chamber (Y)
√4)	Eli McCoy	Potesta (Y)
√5)	Lisa Burgess	Potesta (Y)
√6)	Randy Maggard	Argus Energy (Y)
√7)	John Hill	West Virginia Manufacturers Assoc. (Y)
√8)	Joyce McClure Gentry	ACACIA ENVIRONMENTAL WV Chamber (Y)
√9)	Jason Bostic	WV Coal Association (Y)
10)	Leonard Knee	Bowles Rice (N)

Fayette County Water Quality Coalition

YES ✓ 11) Randy Boyd Plateau Action Network

(yes speaker) ✓ 12) Jennifer Boyd New River Health Association

✓ 13) MARGARET JANES Appalachian Y CENTER

✓ 14) Ann Bradley Independent Oil + Gas Assoc. (V)

15) LARRY EMERSON ARCH COAL, INC.

16) Dan Ramsey - USFWS

17) Jesse M Purkins - NPS

18) Anne Blankenship

19) DOUG HUDSON WVDA - NO -

20) LINDSEY ZAMONSKI · not speaking

21) Mike Callaghan not speaking

22) Robert Armbruster Wetland Trust

23) Mike Castle NOT Speaking

24) Ken Ward NOT Speaking

25) Liz Garland WVRC Y

26)

27)

28)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

JUN 2 3 2003

Dr. Edward M. Snyder, Ph.D., Chair
Environmental Quality Board
1615 Washington Street East
Charleston, WV 25311-2126

Dear Dr. Snyder:

On May 8, 2003, the West Virginia Environmental Quality Board (EQB) began the Public Notice and Comment Period on its proposed changes to West Virginia (WV) Requirements Governing Water Quality Standards. This proposed rule resulted from the States's triennial review of water quality standards (WQS) as required Section 301(c)(1) of the Clean Water Act (CWA). In addition to the proposed revisions, the EQB is requesting comments on three additional issues. Those issues are outlined in the document titled "Notice of Additional Areas of Consideration," which is included in the notice of proposed changes.

EPA appreciates the opportunity to provide comments for your consideration on the proposed changes to WV WQS and Notice of Additional Areas of Consideration. We are pleased with the number of updates to the numeric criteria table. Our comments on the proposed rule and Notice of Additional Areas of Consideration are contained in Enclosure 1.

If you have any questions concerning this letter please, contact Ms. Cheryl Atkinson at (215) 814-3392.

Sincerely,

Evelyn S. MacKnight

Evelyn S. MacKnight, Chief
PA/DE/WV Branch (3WP11)
Office of Watersheds

Printed on 100% recycled/recyclable paper with 100% post-consumer fiber and process chlorine free.
Customer Service Hotline: 1-800-438-2474

Enclosure 1

Section 2.5

This section deletes the words "or not" from the designated uses definition. EPA believes that the state does not intend this to be a substantive change and that it is only a stylistic change. However, this change makes the sentence unclear, particularly because it could appear to differ from the definition in the federal regulations at 40 CFR 131.3(f) which say that, "Designated uses are those uses specified in water quality standards for each water body or segment whether or not they are being attained." EPA recommends that EQB not remove the words "or not" from the designated use definition.

Section 3.2.d

This section adds the reference "USEPA's organoleptic effect criteria may be used when applicable." For clarity, the WV WQS should refer the reader to some specific document listing organoleptic criteria, such as organoleptic criteria in the "National Recommended Water Quality Criteria: 2002" EPA Office of Water, November 2002 (EPA-822-R-02-047) or any other specific document.

Section 4.1.a

This section deletes the word "or not" from the last sentence. The new proposed sentence now reads, "Existing uses are those uses actually attained in the water body on or after November 28, 1975, whether they are included as designated uses within these water quality standards." EPA believes that the state does not intend this to be a substantive change and that it is only a stylistic change. However, this change makes the sentence unclear, particularly because it could appear to differ from the definition in the Federal regulations at 40 CFR 131.3(e) which say that, "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." EPA recommends that EQB not remove the words "or not" from the existing use definition.

Section 7.1

This section deletes the reference list of WV major river basins and its alphanumeric system. EPA understands that this list may have been deleted because an effort is underway to update the state's alphanumeric stream coding system. However, since this section still references the 1956 system, EPA recommends that EQB keep the list in the WQS as a courtesy to the reader. When the new system is in place EQB can update the list and the reference at that time.

Section 7.2.a.2

This section revises an exemption to the "half-mile rule" The WV "half-mile rule" requires that segments of streams located within a half-mile above public water supply intakes be protected by prohibiting the discharge of any pollutants in excess of the concentrations designated for the Public Water Supply designated use. The exemption allows the application of a mixing zone on the specified stretch of the Ohio River, where Weirton Steel Corporation has a drinking water intake approximately 1,500 feet downstream from one of its outfalls. As with any criteria, when WV submits the revision, it should include a sound scientific rationale documenting how this provision would ensure protection of human health considering the public water supply use.

Section 7.2.b

The *Summary of Proposed Changes* statement says that this section "revises the exemption section to allow for application for natural background exemption to apply to trout waters." EPA reminds EQB that before it approves site-specific water quality criteria for a natural condition, WV must find that the natural condition will fully protect existing and designated uses and ensure the full protection of aquatic life, including trout waters.

Section 7.2.d.16.2

EPA is pleased that WV continues to limit the parameters for which this Weirton Steel socioeconomic variance applies. The proposed variance eliminates zinc and extends the socioeconomic variance until July 1, 2007 for lead, temperature, and iron. EPA reminds EQB that it must show that the conditions for granting a variance still apply and that the variance provisions are consistent with 40 CFR 131.10(g). Discharger-specific variances based on the substantial and widespread economic and social economic impact factors would have to include a demonstration that those alternative control strategies were evaluated as part of the showing that standards were not attainable.

Section 7.2.d.19.3

This section proposes a site-specific Category A and Category B1 chloride criteria for the Ward Hollow of Davis Creek. The promulgation of site-specific criteria should follow the appropriate state procedures as specified in the state regulations at 46CSR6, as well as at 46CSR1-7.2.c.4 for site-specific criteria based on natural conditions. EPA reminds WV that site-specific criteria, as with all water quality criteria, must be based on a sound scientific rationale in order to protect the existing and designated uses. The state submission for approval of such criteria should include documentation of that rationale and the methodology used to develop the site-specific criteria.

Section 8.1.a

The Board is also asking for comment on a proposal to revise Section 8.1.a, which refers to 40 CFR 136. One proposal refers to 40 CFR 136 as effective by July 1, 2002. Another proposal refers to "the most recent effective version" of those regulations. The effect of the latter amendment would to be to incorporate prospectively in the state regulations any changes that EPA may incorporate in the federal regulations at 40 CFR 136. If EPA makes changes to 40 CFR 136 in the future, those changes would be automatically incorporated into the state regulations. In some states the state courts have held that such prospective incorporation is illegal or unconstitutional under the state laws and constitution. The Board should verify that prospective incorporation is allowed under West Virginia law before adopting the latter proposal.

Section 8.32.2

EPA supports removing the exemption for surface mining activities from the turbidity criterion. EPA reminds WV the water quality criteria and exemptions thereof must be based on 304(a) guidance or other scientifically defensible methods.

Section 9.2.a

The Board is considering a request to adopt the Great Lakes Initiative standard for determining whether a substance is bioaccumlative. In general, EPA could support the adoption of the Great Lakes Initiative standard for determining whether a substance is bioaccumlative. In its adoption WV should be specific as to which portion of 40 CFR Part of 132 - *Water Quality Guidelines for the Great Lakes System* WV plans to adopt.

Appendix B, C, and D

The EQB has proposed to delete the following list of Use Categories

1. Appendix B - List of Category A water,
2. Appendix C - List of Category E-3 Power Production Water, and
3. Appendix D - List of Category C - Water Contact Recreation Waters.

Note that, in Appendix A, the only list of waters retained is Category B-2 Trout Waters. EPA recommends a statement in the water quality standards that would refer the reader to a referenced list (e.g., The Bureau of Public Health for Category A).

Criteria

EPA is pleased to see numerous new and revised criteria which WV is adopting from EPA's 2002 National Recommended Water Quality Criteria. We are also pleased that WV revised the units used to express the criteria to make them more uniform. However, where the criteria are being converted from mg/l to ug/l, the revisions forget to specify the new unit of ug/l in the table. To avoid confusion, EPA recommends that the criteria table in Appendix E identify the measuring unit for each of the listed criterion.

Arsenic & Dissolved Trivalent Arsenic

WV has proposed to adopt EPA's recommended aquatic life number for arsenic. However, the proposed regulation does not indicate whether the criteria applies to total or dissolved arsenic. (EPA's recommended aquatic life criteria for arsenic is expressed as dissolved.) In addition, WV intends keep its dissolved trivalent arsenic criteria. In the event the EQB keeps both a total and dissolved aquatic life criteria for arsenic, EQB should provide clarification when and how total vs. dissolved arsenic criteria will apply. EPA encourages EQB to review its aquatic life for arsenic and trivalent arsenic and consider adoption of the EPA 2002 National Recommended Water Quality Criteria for arsenic. Otherwise, EQB needs to provide to EPA scientifically defensible rationale to support WV's revised arsenic aquatic life criteria.

Bacteria

EPA is pleased to see that WV has proposed to adopt, in part, EPA's 1986 *Ambient Water Quality Criteria for Bacteria*, which recommends that *Escherichia coli (E. coli)* and enterococi are the best indicators to determine potential risk from acute gastrointestinal disease. Specifically, WV has proposed to keep its old fecal coliform parameter and added EPA's *E. coli* criteria for bathing (body contact) recreational use. WV's proposed criteria states that "if a sample tested for fecal coliform shows noncompliance with the [fecal coliform] provision, then further testing of the sample for *E. coli* can be allowed to determine compliance. If *E. Coli* testing indicates that the sample meets EPA's recommended criteria this will suffice for meeting the criterion."

EPA continues to believe that when appropriately applied and implemented, EPA's 1986 recommended water quality criteria for bacteria based on *E. coli* are protective of human health for acute gastrointestinal illnesses. In addition, testing for *E. coli* only if the fecal coliform sample shows noncompliance may be difficult to implement and may not be the applicable measure. EPA recognizes that states and authorized tribes that have yet to adopt EPA's recommended 1986 water quality criteria for bacteria based on *E. coli* may be concerned about how to ensure consistency and continuity within their regulatory programs. To facilitate this period of transition, EPA recommends that WV include as an alternative both fecal coliform and *E. coli* in its water quality standards for the protection of designated recreational waters for a limited period of time, such as one triennial review cycle, instead of allowing the *E. coli* standard

to apply only "if a sample tested for fecal coliform shows noncompliance with the fecal coliform provision." The dual sets of applicable criteria will enable regulatory decisions and actions based on the fecal coliform standard to continue while collecting data for the newly adopted *E. coli* standard. This would allow WV some time to be actively collecting data on *E. coli* while working to incorporate *E. coli* water quality criteria into their water quality programs, e.g., National Pollutant Discharge
Elimination System (NPDES), 305(b), and 303(d) programs. Alternatively, EPA recommends that WV adopt a delayed effective date together with the *E. coli* standard to allow for time in which to collect data on the newly adopted criteria. Once *E. coli* is adopted into WV water quality standards, EPA encourages WV to remove the fecal coliform criterion as it applies to recreational waters during its next triennial review.

Mercury and Methylmercury

EPA has updated its national recommended mercury and methylmercury criteria for human health and they are available in the report, National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047). EPA encourages WV to review EPA's human health methylmercury criterion and consider adoption of the EPA 2002 National Recommended Water Quality Criteria for this parameter.

Selenium

The EQB has proposed to revise its Category A human health criteria for selenium. The EQB should provide to EPA scientifically defensible rationale to support its revised selenium human health criteria.

WV has added a footnote to its chronic selenium aquatic life criterion (which is expressed as total recoverable) to allow the use of a conversion factor of 0.996 to convert the aquatic life criterion in terms of dissolved. EPA's national recommended criteria allows a conversion factor of 0.922 for chronic selenium aquatic life criteria applied to freshwater. EPA recommends that WV review its aquatic life criteria and either adopt EPA's recommended conversion factor or provide scientific rationale for using a different conversion factor.

Zinc

As you are aware EPA updated its national recommended water quality criteria for zinc and is available in the report, National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047). WV has not proposed revisions to its zinc criteria. Pursuant to 40 CFR 131.11 (b), WV should consider, during the triennial review, adopting EPA's recommended or other criteria supported by scientifically defensible methods.

Expired WQS Standards

EPA requests that EQB review its entire 46CSR1 rule for any site-specific criteria, variances, or other standards that may have expired. In order to clarify and simplify the regulations, EPA recommends that the EQB delete any expired variance, criteria or other standard which are no longer applicable.

Coordination with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS)

In February of 2001, EPA entered into a Memorandum of Agreement (MOA) with the FWS and the NMFS regarding coordination under the CWA and the Endangered Species Act (ESA). Section 7 of the ESA requires that all Federal agencies ensure that any covered action, (including any approval or disapproval action under CWA Section 303(c)) is not likely to jeopardize the continued existence of any threatened or endangered species, or to result in the destruction or adverse modification of the habitat that has been designated as critical for species.

We would appreciate your cooperation in meeting the spirit of these commitments under the MOA in order to expedite our 303(c) action once revisions to WV's WQS rule are submitted for our review. While we recognize that this MOA does not bind the state, dischargers, construction projects and others who are individually responsible for compliance with the Endangered Species Act. The EQB can assist EPA in meeting our commitment by facilitating early exchange of information with the FWS and NMFS and helping in early identification of potential problems. This effort can contribute to a speedier review by EPA and decrease the likelihood of nonconcurrence by FWS and NMFS on an action to approve WV triennial review.

Division of Water and Waste Management
414 Summers Street
Charleston, WV 25301
Telephone Number: (304) 558-2107
Fax Number: (304) 558-5905

West Virginia Department of Environmental Protection

Bob Wise
Governor

Stephanie R. Timmermeyer
Cabinet Secretary

July 9, 2003

RECEIVED
JUL 16 2003
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

Environmental Quality Board
1615 Washington St. E.
Charleston, WV 25311-2126

Re: Proposed Rule 46 CSR-1

Dear Board Members:

The West Virginia Department of Environmental Protection's Division of Water and Waste Management (DWWM) appreciates the opportunity to offer proposed changes, corrections and comments on the Board's proposal filed 5/19/03.

The DWWM further appreciates the Board's consideration of the numerous comments offered in our previously filed comments, which led to many of the changes outlined in the subject proposal.

All following noted references are to the newly proposed section of the rule:

Section 2.4. – Since "water body" is not defined either in this rule or in State Code, the following alternative language is suggested in an effort to clarify the intent: "Designated uses are those uses specified in water quality standards for each state water whether or not they are being attained." This language would be consistent with the federal language for designated uses.

Section 2.5. – Typographical error on "Management".

Section 2.7. – See above comments in Section 2.4. DWWM alternatively suggests the following language: "Existing uses are those uses actually attained in a state water on or after November 28, 1975, whether or not they are included.in the water quality standards".

Section 2.19. – The date offered of July 1, 2001 in this Section is not consistent with the date referenced in the Board's Notice of Additional Areas of Consideration. Such Notice references the July 1, 2002 date. It is suspected that the Board intended the use of the 2002 date.

Section 4.1.a. – The language here should be consistent again with the suggested change in Section 2.4. above.,

Section 5.2.g. – Again, since "water body" is not defined, suggest deleting the word "body". A check throughout the rule should similarly make this change wherever the term is used e.g. in Section 7.2.c.4.

Section 7.1.e.2.&3. – Suggest leaving the reference to Kanawha River Zones 1 & 2 as these descriptions are subsequently used in a number of areas e.g. Section 7.2.d.19 & 20 as well as in Appendix E, Table 1 unless those subsequent referenced areas can be covered with a footnote to describe these segments.

Section 7.2.d.9.1. – For consistency with other language used in this general Section, suggest the following: "**Except that** the upper Blackwater . . . less than 7Q10, **the** naturally occurring . . . applicable criteria".

Section 7.2.d.6.1. – Since the December 31, 1998 time frame has expired, the Board should consider removing this exception.

Section 7.2.d.16.2. – Typographical error in "Management".

Section 7.2.d.19.3. – Similar to 7.2.d.9.1. above, suggest: "**Except that** in Ward Hollow . . . 310 mg/liter".

Section 7.2.d.20.2. – Now that the alphanumeric reference system designations have been eliminated, the Board may want to remove the reference used.

Section 7.2.d.20.3 – See comment in 7.2.d.20.2. above. Additionally, since the May 30, 1998 deadline has expired, the Board should consider removing this exception.

Section 8.1.a. – See comments in Section 2.19. above. Additionally as the Board has elected to continue the inclusion of the reference to 47 CSR 10, the Board may consider inclusion of corresponding similar reference to 47 CSR 30, Section 7.2.

Section 8.1.b.3. – Correct title should read " Division of Water and Waste Management".

Appendix A – Again, since the alphanumeric system designation has been eliminated, the Board may seek reconsideration of the use of the River Basin references in the Appendix.

Appendix E – Table 1: The DWWM suggests that if the proposed elimination of Appendices B, C & D is incorporated, the Board may seek to revise this Appendix to Appendix B to prevent confusion on the part of future recipients of the rule searching for omitted Appendices.

The following are comments and corrections relating to the various criteria changes proposed in Appendix E:

General comment - No "units" are reflected with any of the criteria or is there a footnote included for this purpose. Appropriate units need to be incorporated.

Section 6. – It is not clear whether the Board intended to eliminate the current Human Health Unionized Ammonia criteria or if this omission was an oversight.

Section 27.b.&c. – Although the Board has corrected the conflicting "not to exceed" requirements associated with certain criteria, this language is still incorporated in these sections, as well as in subsequent metal criteria, e.g. Section 40.a.&b., 43.b.&c., 92.b.&c., 101.b.&c., 125.c., and 146.a.&b. Additionally, similar language is used for criteria e.g. Odor, Dissolved Oxygen and Temperature without any clarifying footnote that the alternate language trumps or replaces footnotes 1 and 2. Removal of the phrase or appropriate clarifications to avoid conflicting requirements in each of these areas should be provided.

Section 18. - It is unclear whether the Board intended to propose elimination of the Acute Aquatic Life criteria for Beryllium. Additionally, the basis for the revised Human Health criteria should be noted.

Section 26. - There is no footnote 'w' as included with Butylbenzyl Phthalate. Appears this is an oversight taken from the "Comparison Table of EPA National Recommended Water Quality Criteria 2002 and Water Quality Standards for Priority Toxic Pollutants".

Section 43.a. - It is unclear if the Board intended to include separate Acute and Chronic Aquatic Life values for Copper under 43.a. when 43.b. & c. reflect values for Dissolved Cu based upon applicable hardness data and the listed Conversion Factor. It appears the Board attempted to reflect EPA's rules based upon a hardness of 100 mg/l. To prevent potential improper use of the criteria, we suggest that the Board remove 43.a. and reflect only the appropriate equations of 43.b.&c.

Section 61. - Diethyl Phthalate – (See comment in #4 above).

Section 63. - Dimethyl Phthalate (See comment in #4 above).

Section 64. - Di-n-Butyl Phthalate (See comment in #4 above).

Section 76.a. – Typographical error on "Contact". Also, as pointed out in the Agency's previous comments, "Primary Contact Recreation" is not defined in the Board's rule. Therefore, if the Board desires to continue application of this language, a definition should be provided in Section 2.

Also, see comments in Section 7.1.e.2.&3. above regarding the reference to Zone 1. in 76.b.

As a final comment to this section, the Agency suspects the new allowance to be potentially problematic. For example, current analytical practices require a 24 hr. turnaround time for Fecal Coliform testing which would exceed the 8 hr. mandated hold time for any E-coli

sample. The result would require running both simultaneously which would substantially increase Agency costs. Further, no laboratories are currently certified by the WVDEP's Laboratory Certification Program to perform E-coli analysis.

DWWM understands that the EPA is encouraging the Board to examine adopting E-coli or other similar bacteria criteria. In this regard, the Agency suggests that the Board undertake a more comprehensive examination of associated issues such as EPA studies on contact illness rates, categorizing degrees of contact, seasonality and flow concerns. The Board should seek to re-evaluate the ramifications of the new language and acknowledge costs as part of the Fiscal Note.

Section 81. – It is unclear why Halomethanes, which encompassing compound list is yet to be specified, (see Agency's previous comments) is continued at the current level. Note that with the possible exception of the newly proposed Category 'C' value for Chlorodibromomethane at 13 ug/l, any individual value for other newly established halomethanes e.g. methylene chloride, methyl bromide, bromoform, or dichlorobromomethane is superfluous. It is suspected that inclusion of the individually specified halomethanes was intended by the Board to replace the existing value for total halomethanes. If this was not the intent, then a specified listing of the compound makeup of this criteria should be provided.

Section 92.a. - The basis for the new Category C and the more restrictive Category 'A' values for Lead is unclear. It would also be beneficial for the Board to supply this rationale.

Section 93. – It is unclear if the Board intended to omit applicability of Trout Water Aquatic Life coverage for Malathion. Suggest this was a possible oversight.

General Comments – It is unclear whether the Board intended to eliminate criteria for Nitrite or if this was an oversight.

Section 112.b. - See comments in Section 7.1.e.2.&3. above.

Section 115. - Use of the example values listed for pentachlorophenol could be a future cause of error as a quick research for application of the criteria could lead to alternate use of the values noted. Therefore the Agency suggests reverting to the existing language referring only to the use of the formula and applying an 'x' in the applicable Aquatic Life columns.

Section 116. – It is unclear if the Board intended to omit the existing qualifying language for pH relating to photosynthetic activity.

Section 118. - If the Board intends to continue the Chronic Aquatic Life values for Phthalate Esters, the Agency's previous comment remains in that a defined list of Phthalate Esters must be provided.

Section 120. - Similar to the comments offered for Halomethanes above, the level of Polynuclear Aromatic Hydrocarbons make the values for specifically added PAHs e.g. Acenaphthene, Anthracene, Fluorene, Fluoranthene and Pyrene superfluous. Resolution of the previously commented on issue is still necessary unless the Board's intent was to replace the level of total PAH with the individually specified proposed criteria.

Section 124. – DWWM has concerns over implementing optional criteria. The agency recognizes EPA's position of the scientific acceptability of the use of the conversion factor of 0.922 to express the chronic criteria (not the 0.966 CF value proposed) as a dissolved metal. However, the proposal to provide for either a total recoverable or dissolved criteria could prove problematic. The DEP urges the Board to include only one of these criteria.

Section 126 – The Agency recognizes that the proposed Category 'A' value for Dissolved Solids and Salinity is based upon the value originally published in the EPA Red Book. Agency records suggest that numerous waters may have background levels exceeding this proposed criteria, particularly in waters reflecting moderate to high levels of alkalinity. If the Board re-evaluates the level proposed for WV waters, it may seek to evaluate the basis and rationale for values used by surrounding states before any decision is finalized.

Section 129.b. - See comments in Section 7.1.e.2.&3. Also, since the appendix listings have been eliminated, the Board may wish to omit the reference in 129.c. Additionally in 129.e. reference to "(01)" is inaccurate and the reference to 7.1.d. should be eliminated.

End Note 5 – Need to add "Table 2" after Appendix E.

General Comment – It is unclear whether the Board intended to omit all of the current criteria for "Other Uses" with the exception of Fluoride so noted under Section 79. Additionally, consistent with listing alternate criteria for the Ohio River, the Agency continues to suggest a reconciliation of the Fl criteria with the level established by ORSANCO as well as any associated with Health Department requirements. Alternatively, the Board could separately list the more restrictive value for the Ohio River as a separate Section 79.a., consistent with certain listings e.g. for Fecal Coliform.

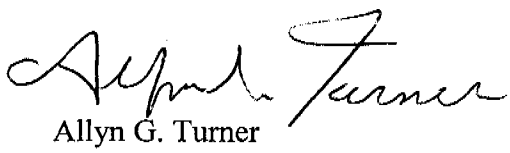
General Comment - Unless already considered, the Board should evaluate for inclusion EPA's revisions to the November 2002 Recommended Criteria for the 15 priority pollutants listed and revised in the December 12, 2002 Federal Register Notice.

Finally, with regard to the recently approved Chronic Aluminum aquatic life criteria, please note that background concentrations in many areas of the State will exceed the established criteria. As a recent example, samples collected by the Division of Mining and Reclamation since October, 2002 involving approximately 200 stations resulting in 1363 sample results yield an average

concentration of 233 ug/l dissolved aluminum. Further, approximately 74% of those stations had at least one exceedence of the criteria. If interested in additional information, the Board may refer to the Agency's previously submitted documentation on this issue in June 1997, subsequent data submitted in early 1999, and other data recently generated by DWWM's Watershed Assessment Program.

The DWWM appreciates the opportunity to offer these comments and appreciates the time extension provided to accommodate the recent flood emergency at our former Greenbrier Street location. We trust that the results will lead to an improved rule that will aid Agency personnel in our various associated program operations as well as enhance the overall quality of our State's waters.

Very Truly Yours,



Allyn G. Turner
Director

AGT/rss

cc: Stephanie Timmermeyer
Matt Crum
Randy Sovic
Pat Campbell
Mike Johnson
Pravin Sangani
Jerry Ray
Ken Politan

STATE OF WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES

Bob Wise
Governor

Paul L. Nusbaum
Secretary

June 23, 2003

Edward M. Snyder, Ph.D., Chair
Environmental Quality Board
1615 Washington Street, East, Suite 301
Charleston, West Virginia 25311-2125

Dear Dr. Snyder:

The West Virginia Department of Health and Human Resources, Bureau for Public Health, Office of Environmental Health Services is pleased to submit the following comment on the fecal coliform standard proposed in Revised Appendix E, Table 1., 76.a. of 46 CSR 1, Requirements Governing Water Quality Standards.

The Office of Environmental Health Services understands the difficulty the Environmental Quality Board has in resolving the manner in which multiple procedures may be used to determine if a surface water body has been impacted by fecal coliform within the human health use designation. The Bureau for Public Health's Office of Laboratory Services has indicated that in accordance with the federal *Safe Drinking Water Act*, the holding time for a source water sample for fecal coliform or E. coli analysis is eight (8) hours, six (6) hours transit time, and two (2) hours sample preparation time. The analysis for fecal coliform requires 24 hours. Therefore, the limited sample holding time for this parameter would not allow the opportunity to use a fraction of the original sample to set up and culture a second sample for purposes of determining the presence of E. coli. Because the holding time for this parameter would be exceeded, the analysis would not be consistent with appropriate laboratory quality assurance and quality control procedures.

It is not specified in 76.a. as to whether a second sample would be collected in the event that the holding time was exceeded on the initial sample analyzed for fecal coliform. If a second sample were to be collected, it would not be representative of the conditions under which the initial sample was collected and it would therefore, be inappropriate to compare the results to those of the first sample. Should the EQB pursue the use of E. coli as a secondary standard for bacteria, the initial sample should be split and both parameters run concurrently.

Sincerely,

Barbara S. Taylor, Director
Office of Environmental Health Services

BST/cjj

BUREAU FOR PUBLIC HEALTH
Office of Environmental Health Services
815 Quarrier Street, Suite 418
Charleston, West Virginia 25301-2616
Telephone: (304) 558-2981 FAX: (304) 558-1291

DEPARTMENT OF THE NAVY
COMMANDER
NAVY REGION, MID-ATLANTIC
6506 HAMPTON BLVD.
NORFOLK, VA 23508-1273

IN REPLY REFER TO:

5090
Code 00R/7/26

JUN 19 2003

Mr. Edward Snyder
W. V. Environmental Quality Board
1615 Washington Street E
Suite 301
Charleston, WV 25311

Dear Mr. Snyder:

SUBJECT: PROPOSED REVISIONS TO TITLE 46, REQUIREMENTS GOVERNING WATER QUALITY STANDARDS

As the Department of Navy Regional Environmental Coordinator for West Virginia, we are submitting the enclosed comments on Title 46. Three comments pertain to the proposed revisions and two comments address existing provisions we hope you will consider. If you have any questions, please contact Mr. Will Bullard at (757) 444-5153.

Sincerely,

Christine H. Porter

CHRISTINE H. PORTER
Head, Regional Environmental
Coordination Office
By direction

Enclosure: Navy comments on West Virginia Rule 46 CSR-1, Requirements Governing Water Quality Standards

Copy to:
Atlantic Division, Naval Facilities Engineering Command (EV12)

Navy Comments on West Virginia Rule 46 CSR-1
Requirements Governing Water Quality Standards

Proposed Revisions

1. Aquatic Life Criteria Acute Averaging Period

Footnote 1 to Table 1 of Appendix E defines the aquatic life acute criteria as a "one hour average". However, the speed of action for acute toxicity may range from one hour for fast acting toxicants such as ammonia and chlorine to longer durations for slower acting toxicants like metals. EPA's revised saltwater criteria document for copper published in 1995 presents the acute criterion as a 24 - hour average. EPA's research on Speed of Action of Metals Acute Toxicity to Aquatic Life published in 1995 shows that lead and zinc would have similar averaging periods, and other metals such as cadmium could have even longer averaging periods. EPA's California Toxics Rule promulgated on May 18, 2000 provides the agency's current guidance on this issue. In that rulemaking, EPA defined the averaging period for the acute criteria as a "short duration" rather than using a one-hour average (65 FR 31700 and 31716, footnote d). EPA's response to comments on its current definition of CMC explains that the term short duration does not mean 1 hour or 24 hours, but is dependent on the individual pollutant. Use of this more general definition allows application of the appropriate averaging period to the particular pollutant for which a waste load allocation is being developed. EPA's Response to Comments document can be found at www.epa.gov/ost/standards/ctr/c25_d.pdf.

Recommendation: Be consistent with the latest rulemaking by EPA. Change Footnote 1 by replacing the words "One hour average concentration" with the words "Short duration (which varies depending on the pollutant) average concentration ".

2. Expression of Metals Criteria

In Table 1 of Appendix E the proposed metals criteria are only expressed as a function of the conversion factor and hardness. The metals criteria should also be expressed as a function of the water effect ratio (WER) as recommended in the CA Toxics Rule issued by EPA on May 18, 2000. Footnote I of the numeric criteria table in that rule states that criteria are expressed as a function of the WER (column B1 or C1 * WER = CMC and column B2 or C2 * WER = CCC. Columns B1 and B2 are freshwater acute and chronic criteria. Expression of criteria as a function of the WER would allow implementation of site-specific criteria in discharge permits before the criteria is promulgated using the procedures in 46 CSR 6.

Recommendation: Add a footnote to Table 1 of Appendix E of the State standards regulation that is consistent with EPA footnote in the CA Toxics Rule.

3. Criteria for Polychlorinated Biphenyls (PCBs)

The aquatic life and human health criteria for PCBs are not consistent with EPA's latest recommended water quality criteria for PCBs, found in EPA's *National Recommended Water Quality Criteria: 2002* (EPA-822-R-02-047, November 2002). The EPA recommended PCB criteria for protection of **aquatic life** are 0.014 ug/l for each of the seven Aroclors (PCB-1242, PCB –1254, PCB-1221, PCB-1232, PCB-1248, PCB-1260, and PCB-1016). It is unclear whether the State current and proposed criterion of 0.014 ug/l for "Polychlorinated biphenyls" applies to each individual Aroclor or to total PCBs. In order to clarify the aquatic life criteria and to be consistent with EPA's recommendation, the criteria in Table 1 of Appendix E of the State's standards should be expressed as 0.014 ug/l for each of the seven individual Aroclors. In contrast to the aquatic life criteria, EPA's latest recommended **human health** criterion for PCBs is expressed as total PCBs. Again, it is unclear whether the State's current human health criterion of 0.000045 ug/l for PCBs applies to individual Aroclors (EPA's previously recommended criteria were expressed this way) or to total PCBs.

Recommendation: Clarify the PCBs human health and aquatic life criteria, and be consistent with EPA recommendations.

Existing Provisions

4. Chronic Aquatic Life Criteria for Silver

The state previously promulgated chronic aquatic life criteria for silver as shown in Table 1 of Appendix E. However, EPA did not publish recommended chronic criteria for silver in its latest published criteria update, *National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047, November 2002)*, because there was not enough acceptable data as specified in EPA guidance entitled *Guidelines for Deriving Numerical National Water Quality Criteria for Protection of Aquatic Organisms and their Uses.*

Recommendation: Repeal the existing chronic aquatic life criteria for silver listed in the state standard rule.

5. Establishment of Safe Concentration Values:

In accordance with Section 46-1-9 and where necessary to protect state waters, safe concentration values may be developed to regulate discharges when there is no promulgated water quality standard. The safe concentration values are developed in one of two ways. The affected discharger can provide the necessary data as specified in Section 9.1 or the state can set the value based on a percentage of the 96-hour LC50 for the discharge pollutant. The safe concentration values are specific to the discharger and are not true water quality standards developed in accordance with EPA guidance and receiving appropriate public comment. EPA guidance entitled *Guidelines for Deriving Numerical National Water Quality Criteria for Protection of Aquatic Organisms and their Uses* requires toxicity testing of at least one species of freshwater animal in at least

eight different families, development of acute to chronic ratios for species of animals in at least three different families, at least one acceptable test with a freshwater alga or vascular plant, and at least one acceptable bio-concentration factor determined with an appropriate freshwater species if a maximum permissible tissue concentration is available.

Recommendation: Remove Section 46-1-9 from the standards rule and issue as separate technical guidance or as part of a permit regulation with clarification that the safe concentration value applies to a site-specific discharge and is not a statewide water quality standard.

14

Questions for DNR

1.) What is the best way to list the NO CODE streams in the Appendix

2.) In Upshur County - Right Fork Middle River - a Code of [redacted], is that correct or should it be MTM?

3.) Code KE for Groves Creek - do you know what County that is in, maybe Clay County?

4.) In Pocahontas County - Red Run of South Fork of Cranberry - a Code of KNC-23-C, is that correct or should it be KNG-23-C?

We have alphabetized the list within each of the River Basins - 1st by County then by stream name within each county.

We have also deleted the exact duplicates, made corrections to Counties, Stream Codes, corrected some typos, and added twenty (20) streams inadvertently left off the proposed list. See Attached

1. We have never figured out a best way. Perhaps, put a footnote that if there is doubt or a question to contact District Fish Biologist. Or, reference it as a trib of another coded stream; e.g., PSB-28-K-6-? Upper Gulf Run is a trib
- of Whites Run (6)
- of Seneca Creek (K)
- of North Fork (28)
- of South Branch (PSB)

2. MTM

3. Clay County

4. KGC-23-C

EQB Fax: 558-4116

To - Libby Chatfield

"AFTER COMMENT APPENDIX A"

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 2.20.

River Basin	County	Stream
James River		
J-1-A	Mercer	Ewin Run
J-3	Monroe	Cove Creek
J-1-C	Monroe	North Fork of Potts Creek
J	Monroe	South Fork Potts Creek
Potomac River		
P	"Berkeley	Hartland Run
P	"Berkeley	Middle Creek (Above Route 30 Bridge)
P	"Berkeley	Mill Creek
P	"Berkeley	Mill Run
P	Berkeley	Opequon Creek
P	"Berkeley	Tillance Creek
P	"Berkeley	Tuscarora Creek (Above Martinsburg)
~~P~~	~~Berkely-Morgan~~	~~Meadow Branch~~
P	"Jefferson	Rocky Marsh Run
P	Jefferson	Town Run
P	Morgan	Meadow Branch
PS	"Jefferson	Big Bullskin Run
PS	"Jefferson	Cattail Run
PS	"Jefferson	Evitt's Run
PS	Jefferson	Flowing Springs Run (Above Halltown)
PS	"Jefferson	Long Marsh Run
PC	Hampshire	Cold Stream
PC	"Hampshire	Dillons Run
PC	Hampshire	Edwards Run ~~of Capon~~ (upstream of pond)
~~PC~~	~~"Hampshire~~	~~Edwards Run and Impoundment~~
PC-17	Hampshire	Hawk Run of Cacapon
PC	"Hardy	Camp Branch
PC	Hardy	Lost River
~~PC~~	~~"Hardy~~	~~Lower Cove Run~~
PC-24-H	Hardy	Lower Cove Run of Lost River
PC	"Hardy	Moores Run
PC	"Hardy	North River (Above Rio)
PC	"Hardy	Rock Cliff Lake (Impoundment)
PC	"Hardy	Trout Pond (Impoundment)
~~PC~~	~~"Hardy~~	~~Trout Run~~
PC-23	Hardy	Trout Run of Cacapon
PC	"Hardy	Waites Run
PC	"Hardy	Warden Lake (Impoundment)

PSB-28-A-1	Grant	Big Run of Jordan Run
PSB-28-E	Grant	High Ridge Run of North Fork
PSB-28-A-2	Grant	Laurel Run of Jordan
PSB	Grant	North Fork Lunice Creek
PSB-29	Grant	Redman Run
PSB-28-B	Grant	Samuel Run of North Fork
PSB-25-C-2	Grant	Spring Run of South Mill Creek
~~PSB~~	~~"Grant~~	~~Spring Run~~
PSB	"Grant	South Fork Lunice Creek
~~PSB~~	~~Grant~~	~~South Mill Creek~~
PSB	"Grant	South Mill Creek (Above Hiser)
PSB	Grant-Pendleton	North Fork South Branch
PSB	Grant-Pendleton	South Branch of Potomac River
PSB	Hampshire	Mill Creek
~~PSB~~	~~"Hampshire~~	~~Mill Run~~
PSB-13	Hampshire	Mill Run of South Branch
~~PSB~~	~~Hardy~~	~~Dumpling Creek~~
PSB-21-F	Hardy	Dumpling Run
PSB-28-EE-2-A	Pendleton	Back Run of Sawmill Branch
~~PSB~~	~~"Pendleton~~	~~Big Run~~
PSB-28-EE	Pendleton	Big Run of North Fork
PSB-28-R	Pendleton	Blizzard Run
PSB-28-S	Pendleton	Brier Gap Run
PSB-32	Pendleton	Briggs Run of South Branch
PSB-28-C	Pendleton	Broad Run of North Fork
PSB-28-K-1	Pendleton	Brushy Run of Seneca Creek
PSB-28-EE-4	Pendleton	Elk Run of Big Run
PSB	Pendleton	Hawes Run (Impoundment)
PSB-28-K-3	Pendleton	Horsecamp Run of Seneca Creek
~~PSB~~	~~"Pendleton~~	~~Laurel Fork~~
PSB-28-G	Pendleton	Laurel Fork of North Fork - to VA line
~~PSB~~	~~Pendleton~~	~~Laurel Fork of North Fork~~
PSB-28-T	Pendleton	Laurel Run of North Fork
PSB	"Pendleton	Little Fork
PSB-28-GG-2-A	Pendleton	Little Low Place Hollow of Laurel Fork
PSB-28-K-2-B	Pendleton	Long Run of Roaring Creek
PSB-28-I	Pendleton	Powdermill Run of North
PSB-33	Pendleton	Reeds Creek
PSB-28-K-2	Pendleton	Roaring Creek of Seneca Creek
PSB-21-K	Pendleton	Rough Run of South Branch
PSB-28-GG-1	Pendleton	Sams Run of Laurel Fork
PSB-28-EE-2	Pendleton	Sawmill Branch of Big Run
PSB	"Pendleton	South Branch (Above North Fork)
PSB-28-K	"Pendleton	~~Seneca~~ Seneca Creek
PSB-28-K-4	Pendleton	Strader Run of Seneca Creek
PSB-28-EE-3	Pendleton	Teter Camp Run of Big Run
PSB-47	Pendleton	Thorn Creek
~~PSB-28-EE-3~~	~~Pendleton~~	~~Teter Camp Run of Big Run~~
PSB-47	Pendleton	Thorn Creek
PSB-28-K-6-?	Pendleton	Upper Gulf Run of Whites Run
PSB-28-GG-2	Pendleton	Vance Run of Laurel Fork
PSB-28-K-3-B	Pendleton	Wamsley Run
PSB-28-K-6	Pendleton	Whites Run of Seneca Creek
PSB-28-I-1	Pendleton	Wilson Run of Kettle Creek

PNB-18	Grant	Difficult Run of North Branch
PNB	Grant	North Fork of Lunice Creek
PNB	Grant/Mineral	North Fork of Patterson Creek
PNB	Grant	Stony River → should be ~~[illegible]~~ upstream of Mt. Storm Lake
PNB-?	Grant	Wilsonia Run of North Branch
PNB-16-B	Grant	Wycroff Run of Abrams Creek
PNB-15-A	Mineral	Cranberry Run of Deep ~~Creek~~ Run
PNB-15	Mineral	Deep Run of North Branch
~~PNB~~	~~"Mineral~~	~~Fort Ashby (Impoundment)~~
PNB-14	Mineral	Howell Run of North Branch
PNB	"Mineral	Mill Creek (Above Markwood)
PNB	"Mineral	New Creek
PNB	"Mineral	New Creek Dam 14 (Impoundment)
~~PNB~~	~~Mineral~~	~~North Fork Patterson Creek~~
PNB	Pendleton	North Branch of Potomac
PNB-16-B-?	Grant	Johnnycake Run of Wycroff Run
S-9-A	Hardy	Capon Run

Ohio River

O	Hancock	North Fork of Kings Creek
O	Ohio	Middle Wheeling Creek

Monongahela River

M	Monongalia-Marion	Whiteday Creek (Above Smithtown)
M	Preston	Boyds Run
M	Preston	Cherry Run of Little Sandy
M	Preston	Fields Creek
M	Preston	Hog Run of Little Sandy
M	Preston	Laurel Run of Big Sandy
MC	"Monongalia	Blaney Hollow
MC	"Monongalia	Coopers Rock (Impoundment)
MC	Monongalia	Morgan Run
MC	Preston	Big Sandy
MC	"Preston	Buffalo Creek
MC-20	"Preston	Elsey Run
MC-33-A	Preston	Flag Run of Buffalo Creek
MC-12-B-3	Preston	Hog Run
~~MC~~	~~Preston~~	~~Laurel Run~~
MC-12-A	Preston	Laurel Run of Big Sandy
MC	Preston	Little Sandy
MC-12-B-6	Preston	Mill Run of Little Sandy
MC	Preston	Muddy Creek
MC	Preston	Piney Run of Little Sandy
MC-18	Preston	Roaring Creek of Cheat R. except lower 2 mi.
MC	Preston	Saltlick Creek
MC-36	Preston	Wolf Creek
MC-41	Preston/Tucker	Long Run
MC-54-K	Preston/Tucker	Twelvemile Run of Clover
MC-60-K-6	Randolph	Baker Camp Run
MC-60-T-8	Randolph	Big Run of Gandy

~~(No code)~~ MC-60-T-?	Randolph	Big Run of Gandy (above the sinks)
MC-60-O-1	Randolph	Big Run of Red Creek
MC	Randolph	Camp Five Run
MC-60-K-15	Randolph	Daniels Creek
~~(No code)~~ MC-60-T-?	Randolph	Devers Run of Gandy
~~MC~~	~~Randolph~~	~~Dry Fork~~
MC	"Randolph	Dry Fork (Above Otter Creek)
MC-60-K-17	Randolph	East Fork of Glady (Above compressor Station
~~MC~~	~~"Randolph~~	~~East Fork Glady Fork (Above C & P Compressor Station)~~
MC-60-K-4	Randolph	Five Lick
MC-60-O-2	Randolph	Flatrock Run
MC	Randolph	Gandy Creek
~~MC~~	~~"Randolph~~	~~Gandy Creek (Above Whitmer)~~
~~MC-60-T~~	~~Randolph~~	~~Gandy Creek (Headwaters) above sinks~~
MC	"Randolph	Glady Fork
MC-60-T-9	Randolph	Grants Branch
MC-60-Q	Randolph	Horsecamp Run
MC	"Randolph	Laurel Fork
~~MC~~	~~Randolph~~	~~Laurel Fork of Dry Fork~~
MC-60-T-1	Randolph	Lower Two Spring
MC-60-K-11	Randolph	McCray Creek
MC-60-T-10	Randolph	Narrow Ridge Run
MC-60-K-2	Randolph	Panther Camp Run
MC	Randolph / ~~Tucker~~ Pocahontas	Shavers Fork (Above Little Black Fork)
MC	"Randolph	Spruce Knob Lake (Impoundment)
MC-60-P	Randolph	Spruce Run
MC-60-T-3	Randolph	Swallow Rock
MC-60-T-6	Randolph	Taylor Run
MC-60-K-1	"Randolph	Three Spring Run
MC-60-R	Randolph	Tory Camp Run
MC-60-T-2	Randolph	Upper Two Spring
MC-60-T-11	Randolph	Warner Run
MC-60-K-16	Randolph	West Fork of Glady - exclude lower 2 miles
MC-60-K-5	Randolph	Woodford Run
MC	Tucker	Aarons Run of Pheasant Run
MC-60-L	Tucker	Big Run of Dry Fork
MC-60-D	"Tucker	Blackwater River (Above Davis)
MC-60-D	"Tucker	Blackwater River (Below Davis) downstream to mouth of North Fork (insert date adopted)
~~MC-60-B~~	~~Tucker~~	~~Blackwater River (Lower Section) - State Park Bridge downstream to mouth of North Branch~~
No Code MC	Tucker	Canoe Run
MC	Tucker	Clover Run
MC-55	Tucker	Dry Run
~~MC~~	~~"Tucker~~	~~Elklick Run~~
MC-60-C	Tucker	Elklick Run of Black Fork
MC-60-I	Tucker	Elklick Run of Dry Fork
MC-60-O-3	Tucker	Gandy Run of Red Creek
MC-54-D	Tucker	Hile Run of Horseshoe Run
MC-54	"Tucker	Horseshoe Run
MC-51-B	Tucker	Indian Run
MC-54-I	Tucker	Leadmine Run of Horseshoe Run
MC-51-C	Tucker	Left Fork of Clover Run
MC-54-E	Tucker	Lick Drain

MC-54-G	Tucker	Lynn Run
~~MC~~	~~Tucker~~	~~Maxwell Run~~
MC-54-C	Tucker	Maxwell Run of Horseshoe
MC-54-A	Tucker	Mike Run of Horseshoe
MC-56	Tucker	Mill Run of Cheat River
MC-60-I	Tucker	Mill Run of Dry Fork
No Code MC	Tucker	Mill Run of Left Fork of Clover
MC-52	Tucker	Minear Run of Cheat
MC	Tucker	Red Creek
MC-60-G	Tucker	Red Run
MC-46-B	Tucker	Right Fork of Bull Run
MC-51-A	Tucker	Right Fork of Clover Run
MC-60-D-10	Tucker	Sand Run
MC	Tucker	Slip Hill Mill Branch
MC	Tucker	Thomas Park (Impoundment)
MC-54-H	Tucker	Thunderstruck Run of Horseshoe
MC-45	Tucker	Tobes Run
No Code MC	Tucker	Two Spring Run of Glady Fork
MC-51-D	Tucker	Valley Fork
MC-57	Tucker	Wolf Run of Cheat River
MC-60-D-11	Tucker	Yoakum Run
MC-54	Tucker/Preston	Horseshoe Run (Headwaters) to Leadmine
~~MC~~	~~Tucker-Randolph~~	~~Shavers Fork~~
(No Code) MC	Pocahontas	Oats Run of Shavers Fork
MCS-55	Pocahontas	Second Fork
MCS-54	Randolph	Beaver Creek
MCS-57	Randolph	Black Run
MCS-47	Randolph	Blister Run
MCS-14	Randolph	Clifton Run
MCS-50	Randolph	First Fork
MCS-48	Randolph	Fish Hatchery Run
MCS-33	Randolph	Fishing Hawk
MCS-43	Randolph	Glade Run
MCS-16	Randolph	Johns Run
MCS-49	Randolph	Lambert Run
MCS-13	Randolph	Little Black Fork
MCS-12	Randolph	Little Laurel Run
MCS-9	Randolph	Nail Run
MCS-15	Randolph	Rattlesnake Run
MCS-46	Randolph	Red Run of Shavers Fork
MCS-22-A	Randolph	Stalnaker Run
MCS-22	Randolph	Taylor Run
MCS-40	Randolph	Whitmeadow Run
MCS-40	Randolph	Yokum Run
~~MCS~~	~~Randolph-Pocahontas~~	~~Shavers Fork (Headwaters) above Old Spruce~~
MCS-4	Tucker	Jobs Run
MCS-5	Tucker	Laurel Run of Shavers Fork
MCS-3-A	Tucker	South Branch of Haddix Run
MCS-7	Tucker	Stonelick Run
~~MW~~	~~Harrison~~	~~Dog Run (Pond)~~
MW	Lewis	Stonecoal Lake

MT	Barbour	Brushy Fork (Above Valley Furnace)
~~MT~~	~~"Barbour~~	~~Mill Run~~
MT-23-F	Barbour	Mill Run of Teter Creek
MT-23-H	Barbour	Mill Run of Teter Creek
~~MT~~	~~"Barbour~~	~~Teter Creek Lake (Impoundment)~~
MT-38	Barbour	Zebs Creek
MT-18-E-5-B	Preston	Frog Run
MT	Preston	Roaring Creek (Above Little Lick Branch)
MT	Preston-Taylor-Monongalia	Laurel Run of Threeforks
MT-66-C	Randolph	Back Fork of Riffle Creek
MT-47	Randolph	Beaver Creek
MT-68	Randolph	Becky Creek from secondary Rt 56 bridge upstream
MT-68-A	Randolph	Big Branch of Becky Creek
~~MT~~	~~"Randolph~~	~~Big Run~~
MT-81	Randolph	Big Run of Tygart
MT-73	Randolph	Clay Run
MT-77	Randolph	Conley Run
~~MT~~	~~"Randolph~~	~~Elkwater Fork~~
MT-74	Randolph	Elkwater Fork above Mowry Run
~~MT~~	~~Randolph~~	~~Files Creek~~
MT-50	Randolph	Files Creek (Rt. FK-MT-50-A) from compressor station upstream
MT-64-C	Randolph	Glade Run
MT-72	Randolph	Hamilton
MT-50-B	Randolph	Left Fork of Files Creek
MT-50-A-1	Randolph	Limekiln Run
MT-74-B	Randolph	Limekiln Run of Elkwater
MT-80	Randolph	Logan Run
MT-44	Randolph	Mathais Run
MT-66-B	Randolph	McGee Run
MT-64-E	Randolph	Meatbox Run
MT-33	Randolph	Middle Form (Upper) above Cassity
MT-64	Randolph	Mill Creek upstream at end of Co. Rt. 46/4
MT-74-A	Randolph	Mowry Run
MT-64-F	Randolph	Potatohole Fork
MT-67	Randolph	Rafe Run
MT-78	Randolph	Ralston Run
MT-66	Randolph	Riffle Creek - above McGee Run
MT-45-C	Randolph	Right Fork of Chenoweth Creek
MT-61	Randolph	Shavers Run
MT-75	Randolph	Stewart Run
MT	Randolph	Tygart River (Above Huttonsville)
MT-79	Randolph	Windy Run
MT	Taylor-Barbour	Tygart Lake Tailwaters (Above Route 119 Bridge)
~~MT~~	~~Upshur~~	~~Buckhannon River~~
MT M	Upshur	Right Fork of Middle Fork
MT B-32	Upshur-Randolph	Left Fork Buckhannon
MT B-31	Upshur-Randolph	Right Fork of Buckhannon
MTB-32-H	Randolph	Beech Run
MTB-31-I	Randolph	Devil Fork
~~MTB-32~~	~~Randolph~~	~~Left Fork of Buckhannon (Upper) upstream of Star Bridge~~

(No Code) MT-56?	Randolph	Millstone Run Right Fork of Files Creek
~~MTB-31~~	~~Randolph~~	~~Right Fork of Buckhannon (Head) above Pickens~~
MTB-31-C	Upshur	Alec Run
MTB-28	Upshur	Big Run of Buckhannon - about DLM drain
MTB	Upshur	Buckhannon River (Above Beans Mill)
~~MTB~~	~~Upshur~~	~~French Creek~~
MTB-32-E	Upshur	Lick Run
MTB-31-D	Upshur	Millsite Run
MTB-27	Upshur	Panther Fork (headwaters) - from 2 miles above Co. Rt. 32
MTB-31-B	Upshur	Reger Run
MTB-25-A	Upshur	Right Fork of Tenmile Creek - except lower ½ mile
MTB-32-D	Upshur-Randolph	Bearcamp Run
MTB	Upshur-Randolph	Left Fork Right Fork
~~MTB~~	~~Upshur-Randolph-Lewis~~	~~Right Fork Buckhannon River~~
MTM-26	Randolph	Birch Fork of Middle Fork
MTM-16	Randolph	Cassity Fork (Upper) - above Mulberry Run
MTM-28	Randolph	Kittle Run
MTM-23	Randolph	Laurel Branch
MTM-22	Randolph	Laurel Run of Middle Fork
MTM-13	Randolph	Long Run
MTM	Randolph	Middle Fork River (Above Cassity)
MTM-27	Randolph	Mitchell Lick Fork
(No Code) MTM-16-?	Randolph	Panther Run of Cassity Fork (Upper) except lower 1/4 mile
MTM-21	Randolph	Pleasants Run
MTM-25	Randolph	Schoolcraft Run
MTM-24-A	Randolph	Spice Run
MTM-24	Randolph	Sugar Run
MTM-11-E	Upshur	Jenks Fork
MTM-11	Upshur	Right Fork Middle Fork River
~~MTM-11~~	~~Upshur~~	~~Right Fork Middle Fork - above Hemlock~~
MTM-11-D	Upshur-Randolph	Jackson Fork
MY	Preston	Maple Run
MY	Preston	Rhine Creek
MY	Preston	Snowy Creek
MY	Preston	Youghiogheny River
No Code ~~MTM-26-?~~ KNG-88-A-?	Pocahontas	Sutton Run of North Fork of Deer Creek
No Code MTM-26-?	Randolph	Rocky Run of Birch Fork
No Code KG-60-?	Webster	Right Fork of Turkey Creek of Gauley

Little Kanawha River

LK-131	Upshur	Getout Run
LK	Upshur	Left Fork-Right Fork (Little Kanawha River)
LK	Upshur-Lewis	Little Kanawha River (Above Wildcat)

Kanawha River

K	Fayette	Falls Creek
K-76	Fayette	Loop Creek
K	Fayette	Paint Creek
K	Upshur	Left Fork of Right Fork Little Kanawha
KC	Boone	Hopkins Fork
KC	Boone	Spruce Laurel Fork
KC	Boone	West Fork of Pond Fork
KC	Kanawha	Little Coal River
KC	Raleigh	Clear Fork
KC	Raleigh	Marsh Fork
KC	Raleigh	Peachtree Creek
KE	Clay	Groves Creek
KE	Braxton	Camp Creek (Centralia)
KE	"Braxton	Sutton Lake Tailwaters (Above Route 33/5 Bridge)
KE	Braxton	Sutton Reservoir
KE	Braxton	Wolf Creek (Centralia)
KE	Clay	Blue Knob Creek
KE-50-I	Clay	Rockcamp Run
KE	Clay	Strange Creek
KE	Kanawha	Blue Creek
KE-76-Q	Nicholas	Poplar Creek
KE-76-L.5	Nicholas	Tug Fork
KE-135	Pocahontas	Big Run of Elk
KE-138	Pocahontas	Big Spring Fork
KE-139-B	Pocahontas	Crooked Fork
KE-138-B	Pocahontas	Cup Run
KE-133	Pocahontas	Dry Branch
KE	Pocahontas	Elk River (Slaty Fork Section)
KE-137	Pocahontas	Laurel Run of Elk
KE-136	Pocahontas	Props Run
KE-139-.5A	Pocahontas	Slaty Fork
KE	Pocahontas,Randolph	Elk River
KE-130	Randolph	Chimney Rock Run
KE-129	Randolph	Valley Fork
KE	Randolph-Webster	Right Fork of Leatherwood
KE	Webster	Back Fork
KE	Webster	Back Fork of Elk
KE-127	Webster	Big Run of Elk
KE	"Webster	Desert Fork
KE-98-B-16	Webster	Desert Fork (Headwaters) above Roaring Run
KE	"Webster	Elk River (Above Webster Springs)
KE-98-C-14	"Webster	Fall Run
KE	Webster	Laurel Creek (Erbacon)
KE	"Webster	Laurel Fork
KE-98-C-11	Webster	Laurel Fork of Left Fork of Holly
KE-98-C	"Webster	Left Fork Holly River
KE-98-C	Webster	Left Fork of Holly (Headwaters upstream of Rt 20 Bridge
KE-111-K-2	Webster	Little Sugar Creek
KE	"Webster	Sugar Creek
KE-111-K	Webster	Sugar Creek (Headwaters) above Little Sugar

KE-118	Webster-Randolph	Bergoo Creek
KC-31-B	Boone	Hopkins Fork
KC	"Raleigh	Marsh Fork (Above Sundial)
KC	Raleigh	Stephens Lake (Impoundment)
KG-19-I	Fayette	Brackens Creek
KG-19-A	Fayette	Dogwood Creek
KG	Fayette	Glade Creek
KG-6	Fayette	Rich Creek
No code	Fayette	Surbaugh Creek
KG	Fayette	Wolf Creek
KG-34-H-14	Greenbrier	Bear Run
KG-34-G-8	Greenbrier	Becky Run
KG-34-E-8	Greenbrier	Beech Run
KG	Greenbrier	Big Clear Creek
KG-34-G-13	Greenbrier	Big Run of South Fork of Cherry
KG-34-G-2	Greenbrier	Briery Run
KG-19-U-1	Greenbrier	Brown Creek
KG-34-H-5	Greenbrier	Coats Run
KG-34-G-10	Greenbrier	Cold Knob Fork
KG-34-E-13	Greenbrier	Cold Spring Branch
KG-34-G-5	Greenbrier	Elklick Run
KG-34-E-9	Greenbrier	Hogcamp Run
KG-34-F-2	Greenbrier	Improvement Branch
KG-19-U-2-D	Greenbrier	Job Knob Branch
KG-19-V-7	Greenbrier	Kuhn Branch
KG	"Greenbrier	Little Clear Creek and Laurel Run
KG-34-E	Greenbrier/Nicholas	Laurel Creek (Headwaters) from McMillion Run upstream
KG	"Greenbrier	Meadow Creek
KG-34-E-11	Greenbrier	Middle Branch
KG-19-U-2-C	Greenbrier	Old Field Branch
KG-34-G-6	Greenbrier	Rocky Run
KG-19-U-3	Greenbrier	Sam Creek
KG-34-G	Greenbrier	South Fork of Cherry(Headwaters) downstream to Rocky Run
KG	Greenbrier	Summit Lake (Impoundment)
KG-24	Greenbrier-Nicholas	Hominey Creek
KG	Greenbrier-Nicholas	Laurel Creek
KG-34-H	Greenbrier-Nicholas	North Fork Cherry River
KG	Greenbrier-Nicholas	South Fork Cherry River
KG	"Nicholas	Anglins Creek
KG-19-G	Nicholas	Anglins Creek (Headwaters) - 41/9 bridge upstream
KG-26-K	Nicholas	Brushy Creek
KG-24-E-2	Nicholas	Brushy Meadow Creek
KG-34	Nicholas	Cherry River
KG	Nicholas	Collison Creek
KG-20	Nicholas	Collison Creek
KG-32-I	Nicholas	Cranenest Run
KG	Nicholas	Deer Creek
KG-24-E	Nicholas	Grassy Creek
KG	Nicholas	Hominy Creek

~~KG-24~~	~~Nicholas~~	~~Horminey Creek (Middle)~~
~~KG-24~~	~~Nicholas~~	~~Horminey Creek (Lower)~~
~~KG-24~~	~~Nicholas~~	~~Horminey Creek (Upper)~~
KG	Nicholas	Panther Creek
KG	Nicholas	Peters Creek
KG-24-I	Nicholas	Price Fork
KG	Nicholas	Summersville Reservoir (Impoundment)
KG	"Nicholas	Summersville Tailwaters (Above Collison Creek)
~~KG~~	~~Nicholas-Greenbrier~~	~~Laurel Creek of Cherry~~
KG34-F	Nicholas-Greenbrier	Little Laurel Creek
~~KG-34-H~~	~~Nicholas-Greenbrier~~	~~North Fork of Cherry~~
~~KG~~	~~Nicholas-Greenbrier~~	~~North Fork of Cherry~~
KG-34-H-4	Nicholas-Randolph	Hunters Run
(No Code) KG-34-H-?	Pocahontas	Darnell Run of North Fork of Cherry
KGW	Pocahontas-Webster	Williams River
KGC	Pocahontas-Webster-Nicholas	Cranberry River
KG-73	Randolph-Pocahontas	North Fork of Gauley
KG-72	Randolph-Pocahontas	Middle Fork of Gauley
~~KG~~	~~Randolph-Webster~~	~~Gauley River Headwaters~~
~~KG~~	~~Randolph-Webster~~	~~Gauley River (Above Moust Coal Tipple)~~
KG-45	Webster	Big Laurel Fork
KG-59	Webster	Big Run of Gauley
KG-70	Webster	Big Run of Gauley
KG	Webster	Gauley River (Headwaters) above Jerryville
KG-61	Webster	Hughes Run
KG-58	Webster	Laurel Creek of Gauley
KG-57	Webster	Miller Mill Run
KG-67	Webster	Straight Creek of Gauley
KG-60	Webster	Turkey Creek
KG-65	Webster	Williams Camp Run

KGC-3	Nicholas	Jakeman Run
KGC-4-A	Nicholas	Little Barrenshe
KGC-4	Pocahontas	Barrenshe Run
(No code) KE	Pocahontas	Hawthorne Run or Jeffery Run of Big Spring Fork
KGC-24	Pocahontas	North Fork of Cranberry (Only the C&R Area)
KGC	Pocahontas	South Fork Cranberry River
KGC	Pocahontas-Webster-Nicholas	Cranberry River
KGC-19	Randolph	Dogway Fork
KGC-9	Webster	Aldrich Run
KGC-8	Webster	Foxtree Run
KGC-15	Webster	Hanging Rock Branch
KGC-7	Webster-Nicholas	Bee Run

KGW-26	Pocahontas	Black Mountain Run
KGW-25	Pocahontas	Day Run
KGW-20-A	Pocahontas	Lick Creek
KGW-22	Pocahontas	Little Laurel Creek
KGW-27	Pocahontas	Mountain Lick Run
KGW-21	Pocahontas	Sugar Creek
KGW-20	Pocahontas	Tea Creek

~~KGW~~	~~Pocahontas~~	~~Williams River above Day Run Campground~~
KGW-10	"Pocahontas-Webster	Middle Fork of Williams
KGW	Pocahontas-Webster	Williams River (Above Dyer)
KGW-1	Webster	Craig Run
KGW-2	Webster	Jonathan Run
KGW-9	Webster	Lick Branch
KGW-3	Webster	Sawyer Run
KGW-4	Webster	Spice Run
KGW-8	Webster	White Oak Fork
KN-23	Fayette	Buffalo Creek
KN-27-C	Fayette	Chestnut Knob Fork of Laurel
KN	Fayette	Dunloup Creek ~~(Downstream from Harvey Sewage Treatment Plant)~~
KN	Fayette	Glade Creek of Manns
KN-15	Fayette	Keeney Creek
~~KN~~	~~"Fayette~~	~~Laurel Creek (Above Cotton Hill)~~
KN-27	Fayette	Laurel Creek of New River
KN	Fayette	Meadow Fork
KN	Fayette	Mill Creek
~~KN~~	~~Fayette~~	~~Mill Creek of New River~~
KN	Mercer	East River (Above Kelleysville)
KN	"Mercer	Pigeon Creek
KN	Monroe	Laurel Creek
KN-61	Monroe	Rich Creek
KN-51-Q	"Monroe	Turkey Creek
KN	Raleigh	Beaver Creek
~~KN~~	~~Raleigh~~	~~Dunloup Creek~~
KN-26-B	Raleigh	Fat Creek
~~KN~~	~~Raleigh~~	~~Glade Creek~~
KN	Raleigh	Glade Creek of New River
KN-29-E	Raleigh	Pinch Creek
KN-26	Raleigh	Piney Creek
KN	Summers	Meadow Creek
KNB-30	Mercer	Crane Creek
KNB-12-B	Mercer	Laurel Creek (Bluestone)
KNB-3	Summers	Little Bluestone
KNG	"Greenbrier	Anthony Creek (Above Big Draft)
KNG(S)-3-A	Greenbrier	Burns Run
KNG	Greenbrier	Culverson Creek
KNG(S)-2-B	Greenbrier	Flynn Creek
KNG	Greenbrier	Hughart Creek
KNG (57)-1	"Greenbrier	Milligan Creek
~~KNG(S)-1~~	~~Greenbrier~~	~~Milligan Creek - upstream of old Rt. 60~~
KNG	Greenbrier	North Fork Anthony Creek
KNG-(S)-3-C-1	Greenbrier	Roaring Creek
KNG	Greenbrier	Sinking Creek
KNG	"Greenbrier	Spring Creek
KNG-28-Q-2	Greenbrier	Twomile Run

~~KNG~~	~~Greenbrier-Monroe~~	~~Second Creek (Rt. 219 Bridge to Nickell's Mill)~~
KNG-23	Greenbrier-Monroe	Second Creek - a 2 mile section around Rodgers Mill (Fly Fishing Only section)
KNG	Monroe	Kitchen Creek (Above Gap Mills)
KNG-78-L	"Pocahontas	Abes Run
KNG-53-G	Pocahontas	Barclay Run
KNG	"Pocahontas	Beaver Creek
KNG-68-A-5	Pocahontas	Black Run
KNG	"Pocahontas	Buffalo Fork (Impoundment)
KNG-79-C-2	Pocahontas	Club House Run
KNG	"Pocahontas	Deer Creek
KNG-53-H	Pocahontas	Douthat Creek
KNG -78	Pocahontas	East Fork of Greenbrier
~~KNG-78~~	~~Pocahontas~~	~~East Fork Greenbrier River (Head) above Abes Run~~
KNG-68-A-6	Pocahontas	Elleber Run
KNG-79-B	Pocahontas	Fill Run
KNG-78-G	"Pocahontas	Five Mile Run
KNG	"Pocahontas	Greenbrier River (Above Hosterman)
KNG-68-A-6	Pocahontas	Griffin Run
KNG	"Pocahontas	Hills Creek
KNG-78-A	Pocahontas	Johns Run
KNG	"Pocahontas	Knapp's Creek
KNG-60	Pocahontas	Laurel Run of Greenbrier
KNG-70	Pocahontas	Leatherbark Run
~~KNG~~	~~"Pocahontas~~	~~Little River East Fork~~
KNG-78-C	Pocahontas	Little River of East Fork (Head) downstream to Buffalo Fork
~~KNG~~	~~"Pocahontas~~	~~Little River West Fork~~
KNG-79-C	Pocahontas	Little River of West Fork (Head) first low water bridge
KNG	Pocahontas	Locust Creek
KNG-78-H-1	Pocahontas	Long Run
KNG-78-K	"Pocahontas	Mullenax Run
~~KNG~~	~~"Pocahontas~~	~~North Fork Deer Creek (Above Route 28/5)~~
KNG-68-A	Pocahontas	North Fork of Deer Creek - FS bridge below Sutton Run
KNG-78-H	Pocahontas	Poca Run
KNG-23-C	Pocahontas	Red Run of South Fork of Cranberry
KNG	"Pocahontas	Seneca (Impoundment)
KNG-66-D	Pocahontas	Shock Run
KNG	"Pocahontas	Sitlington Creek
KNG-79-C-1	Pocahontas	Spanoak
KNG	"Pocahontas	Stoney Creek
KNG-49	"Pocahontas	Swago Creek
KNG-68-A-4	Pocahontas	Tacker Fork
KNG	Pocahontas	Thorny Creek
KNG-74	Pocahontas	Trout Run of Greenbrier
KNG	Pocahontas	Watoga Lake
KNG -79	Pocahontas	West Fork Greenbrier
~~KNG~~	~~"Pocahontas~~	~~West Fork Greenbrier River (Above the impoundment at the tannery)~~
~~KNG-79~~	~~Pocahontas~~	~~West Fork of Greenbrier (Head) above~~ Wildell

No Code	Randolph	White Run of East Fork of Glady
KNB	"Mercer	Camp Creek
KNB	Mercer	Marsh Fork
OG	Logan	Big Huff Creek
OG	Raleigh-Wyoming	Slab Fork
OG	Wyoming	Laurel Fork of Clear Fork
OG	Wyoming	Pinnacle Creek creek

Tug Fork of Big Sandy River

~~BST~~	~~McDowell~~	~~Dry Fork (Above Canebrake)~~
BST	McDowell	Dry Fork of Tug
BST-99	McDowell	Elkhorn Creek
~~BST-99~~	~~McDowell~~	~~Elkhorn Creek - downstream to North Fork~~
BST-70-W	McDowell	Jacob Fork

DIVISION OF NATURAL RESOURCES
Wildlife Resources Section
Operations Center
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Bob Wise
Governor

Ed Hamrick
Director

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To: Libby Chatfield

From: Tom Oldham

Wildlife Resources Section
WV Division of Natural Resources

Fax #: (304) 637-0250

More Coming

Comments:

Pages transmitted, including cover: 14

If there are an incorrect number of pages, please call 304-637-0245

~~PC (2) - 23 - A - 1 - (2)~~	~~"Hardy~~	
PC (2) - 25 - A - 1 - (2)	"Hardy	Trout Pond (Impoundment)
~~PC~~	~~"Hardy~~	~~Trout Run~~
PC-23	Hardy	Trout Run of Cacapon
PC - 22	"Hardy	Waites Run
PC (2) - 20 - (1)	"Hardy	Warden Lake (Impoundment)

PSB-28-A-1	Grant	Big Run of Jordan Run
PSB-28-E	Grant	High Ridge Run of North Fork
PSB-28-A-2	Grant	Laurel Run of Jordan
PSB	Grant	North Fork Lunice Creek
PSB-29	Grant	Redman Run
PSB-28-B	Grant	Samuel Run of North Fork
PSB-25-C-2	Grant	Spring Run of South Mill Creek
~~PSB~~	~~"Grant~~	~~Spring Run~~
PSB -26-D	"Grant	South Fork Lunice Creek
~~PSB~~	~~Grant~~	~~South Mill Creek~~
PSB -25-C	"Grant	South Mill Creek (Above Hiser)
PSB -28	Grant-Pendleton	North Fork South Branch
PSB	Grant-Pendleton	South Branch of Potomac River
PSB -9	Hampshire	Mill Creek
~~PSB~~	~~"Hampshire~~	~~Mill Run~~
PSB-13	Hampshire	Mill Run of South Branch
~~PSB~~	~~Hardy~~	~~Dumpling Creek~~
PSB-21-F	Hardy	Dumpling Run
PSB-28-EE-2-A	Pendleton	Back Run of Sawmill Branch
~~PSB~~	~~"Pendleton~~	~~Big Run~~
PSB-28-EE	Pendleton	Big Run of North Fork
PSB-28-R	Pendleton	Blizzard Run
PSB-28-S	Pendleton	Brier Gap Run
PSB-32	Pendleton	Briggs Run of South Branch
PSB-28-C	Pendleton	Broad Run of North Fork
PSB-28-K-1	Pendleton	Brushy Run of Seneca Creek
PSB-28-EE-4	Pendleton	Elk Run of Big Run
PSB (L) - 21 - X - (1)	Pendleton	Hawes Run (Impoundment)
PSB-28-K-3	Pendleton	Horsecamp Run of Seneca Creek
~~PSB~~	~~"Pendleton~~	~~Laurel Fork~~
PSB-28-G	Pendleton	Laurel Fork of North Fork - to VA line
~~PSB~~	~~Pendleton~~	~~Laurel Fork of North Fork~~
PSB-28-T	Pendleton	Laurel Run of North Fork
PSB	"Pendleton	Little Fork
PSB-28-GG-2-A	Pendleton	Little Low Place Hollow of Laurel Fork
PSB-28-K-2-B	Pendleton	Long Run of Roaring Creek
PSB-28-I	Pendleton	Powdermill Run of North
PSB-33	Pendleton	Reeds Creek
PSB-28-K-2	Pendleton	Roaring Creek of Seneca Creek
PSB-21-K	Pendleton	Rough Run of South Branch
PSB-28-GG-1	Pendleton	Sams Run of Laurel Fork
PSB-28-EE-2	Pendleton	Sawmill Branch of Big Run
PSB	"Pendleton	South Branch (Above North Fork)
PSB-28-K	"Pendleton	~~Senaca~~ Seneca Creek
PSB-28-K-4	Pendleton	Strader Run of Seneca Creek
PSB-28-EE-3	Pendleton	Teter Camp Run of Big Run
PSB-47	Pendleton	Thorn Creek
~~PSB-28-EE-3~~	~~Pendleton~~	~~Teter Camp Run of Big Run~~
PSB-47	Pendleton	Thorn Creek
PSB-28-K-6-?	Pendleton	Upper Gulf Run of Whites Run
PSB-28-GG-2	Pendleton	Vance Run of Laurel Fork
PSB-28-K-3-B	Pendleton	Wamsley Run
PSB-28-K-6	Pendleton	Whites Run of Seneca Creek
PSB-28-I-1	Pendleton	Wilson Run of Kettle Creek

PNB-18	Grant	Difficult Run of North Branch
PNB	Grant	North Fork of Lunice Creek
PNB	Grant/Mineral	North Fork of Patterson Creek
PNB	Grant	Stony River → should be removed
PNB-?	Grant	Wilsonia Run of North Branch
PNB-16-B	Grant	Wycroff Run of Abrams Creek
PNB-15-A	Mineral	Cranberry Run of Deep Creek Run
PNB-15	Mineral	Deep Run of North Branch
~~PNB~~	~~"Mineral~~	~~Fort Ashby (Impoundment)~~
PNB-14	Mineral	Howell Run of North Branch
PNB -4-5	"Mineral	Mill Creek (Above Markwood)
PNB -7	"Mineral	New Creek
PNB (2)-7-4-(1)	"Mineral	New Creek Dam 14 (Impoundment)
~~PNB~~	~~Mineral~~	~~North Fork Patterson Creek~~
PNB	Pendleton	North Branch of Potomac
PNB-16-B-?	Grant	Johnnycake Run of Wycroff Run
S-9-A	Hardy	Capon Run

upstream of Mt. Storm Lake

Ohio River

O-98-A	Hancock	North Fork of Kings Creek
O-88-D-A	Ohio	Middle Wheeling Creek

Monongahela River

M-16	Monongalia-Marion	Whiteday Creek (Above Smithtown)
MT-12-?	Preston	Boyds Run
MC-12-B-5	Preston	Cherry Run of Little Sandy
MT-12-?	Preston	Fields Creek
MC-12-B-3	Preston	Hog Run of Little Sandy
MC-12-A	Preston	Laurel Run of Big Sandy
MC-2-B	"Monongalia	Blaney Hollow
MC (2)-6-(1)	"Monongalia	Coopers Rock (Impoundment)
MC-2	Monongalia	Morgan Run
MC-12	Preston	Big Sandy
MC-33	"Preston	Buffalo Creek
MC-20	"Preston	Elsey Run
MC-33-A	Preston	Flag Run of Buffalo Creek
MC-12-B-3	Preston	Hog Run
~~MC~~	~~Preston~~	~~Laurel Run~~
MC-12-A	Preston	Laurel Run of Big Sandy
MC-12-B	Preston	Little Sandy
MC-12-B-6	Preston	Mill Run of Little Sandy
MC-17	Preston	Muddy Creek
MC-12-B-?	Preston	Piney Run of Little Sandy
MC-18	Preston	Roaring Creek of Cheat R. except lower 2 mi.
MC-32	Preston	Saltlick Creek
MC-36	Preston	Wolf Creek
MC-41	Preston/Tucker	Long Run
MC-54-K	Preston/Tucker	Twelvemile Run of Clover
MC-60-K-6	Randolph	Baker Camp Run
MC-60-T-8	Randolph	Big Run of Gandy

~~(No code)~~ MC-60-T-?	Randolph	Big Run of Gandy (above the sinks)
MC-60-O-1	Randolph	Big Run of Red Creek
MC-60-N-10	Randolph	Camp Five Run
MC-60-K-15	Randolph	Daniels Creek
~~(No code)~~ MC-60-T-?	Randolph	Devers Run of Gandy
~~MC~~	~~Randolph~~	~~Dry Fork~~
MC-60	"Randolph	Dry Fork (Above Otter Creek)
MC-60-K-17	Randolph	East Fork of Glady (Above compressor station
~~MC~~	~~"Randolph~~	~~East Fork Glady Fork (Above C & P Compressor Station)~~
MC-60-K-4	Randolph	Five Lick
MC-60-O-2	Randolph	Flatrock Run
MC-60-T	Randolph	Gandy Creek
~~MC~~	~~"Randolph~~	~~Gandy Creek (Above Whitmer)~~
~~MC-60-T~~	~~Randolph~~	~~Gandy Creek (Headwaters) above sinks~~
MC-60-K	"Randolph	Glady Fork
MC-60-T-9	Randolph	Grants Branch
MC-60-Q	Randolph	Horsecamp Run
MC-60-N	"Randolph	Laurel Fork
~~MC~~	~~Randolph~~	~~Laurel Fork of Dry Fork~~
MC-60-T-1	Randolph	Lower Two Spring
MC-60-K-11	Randolph	McCray Creek
MC-60-T-10	Randolph	Narrow Ridge Run
MC-60-K-2	Randolph	Panther Camp Run
MC≤	Randolph / Pocahontas	Shavers Fork (Above Little Black Fork)
MC (4)-60-T-10-(1)	"Randolph	Spruce Knob Lake (Impoundment)
MC-60-P	Randolph	Spruce Run
MC-60-T-3	Randolph	Swallow Rock
MC-60-T-6	Randolph	Taylor Run
MC-60-K-1	"Randolph	Three Spring Run
MC-60-R	Randolph	Tory Camp Run
MC-60-T-2	Randolph	Upper Two Spring
MC-60-T-11	Randolph	Warner Run
MC-60-K-16	Randolph	West Fork of Glady - exclude lower 2 miles
MC-60-K-5	Randolph	Woodford Run
MC-33-A-1-?	Tucker	Aarons Run of Pheasant Run
MC-60-L	Tucker	Big Run of Dry Fork
MC-60-D	"Tucker	Blackwater River (Above Davis)
MC-60-D	"Tucker	Blackwater River (Below Davis) downstream to mouth of North Fork
		(insert date adopted)
~~MC-60-D~~	~~Tucker~~	~~Blackwater River (Lower Section) - State Park Bridge downstream to mouth of North Branch~~
No Code MC	Tucker	Canoe Run
MC-57	Tucker	Clover Run
MC-55	Tucker	Dry Run
~~MC~~	~~"Tucker~~	~~Elklick Run~~
MC-60-C	Tucker	Elklick Run of Black Fork
MC-60-I	Tucker	Elklick Run of Dry Fork
MC-60-O-3	Tucker	Gandy Run of Red Creek
MC-54-D	Tucker	Hile Run of Horseshoe Run
MC-54	"Tucker	Horseshoe Run
MC-51-B	Tucker	Indian Run
MC-54-I	Tucker	Leadmine Run of Horseshoe Run
MC-51-C	Tucker	Left Fork of Clover Run
MC-54-E	Tucker	Lick Drain

MC-54-G	Tucker	Lynn Run
~~MC~~	~~"Tucker~~	~~Maxwell Run~~
MC-54-C	Tucker	Maxwell Run of Horseshoe
MC-54-A	Tucker	Mike Run of Horseshoe
MC-56	Tucker	Mill Run of Cheat River
MC-60-I	Tucker	Mill Run of Dry Fork
No Code MC	Tucker	Mill Run of Left Fork of Clover
MC-52	Tucker	Minear Run of Cheat
MC-60-O	"Tucker	Red Creek
MC-60-G	Tucker	Red Run
MC-46-B	Tucker	Right Fork of Bull Run
MC-51-A	Tucker	Right Fork of Clover Run
MC-60-D-10	Tucker	Sand Run
MC-56-?	"Tucker	Slip Hill Mill Branch
MC (L)-60-O-3-(1)	"Tucker	Thomas Park (Impoundment)
MC-54-H	Tucker	Thunderstruck Run of Horseshoe
MC-45	Tucker	Tobes Run
No Code MC	Tucker	Two Spring Run of Glady Fork
MC-51-D	Tucker	Valley Fork
MC-57	Tucker	Wolf Run of Cheat River
MC-60-D-11	Tucker	Yoakum Run
MC-54	Tucker/Preston	Horseshoe Run (Headwaters) to Leadmine
~~MC~~	~~Tucker-Randolph~~	~~Shavers Fork~~
(No Code) MC	Pocahontas	Oats Run of Shavers Fork
MCS-55	Pocahontas	Second Fork
MCS-54	Randolph	Beaver Creek
MCS-57	Randolph	Black Run
MCS-47	Randolph	Blister Run
MCS-14	Randolph	Clifton Run
MCS-50	Randolph	First Fork
MCS-48	Randolph	Fish Hatchery Run
MCS-33	Randolph	Fishing Hawk
MCS-43	Randolph	Glade Run
MCS-16	Randolph	Johns Run
MCS-49	Randolph	Lambert Run
MCS-13	Randolph	Little Black Fork
MCS-12	Randolph	Little Laurel Run
MCS-9	Randolph	Nail Run
MCS-15	Randolph	Rattlesnake Run
MCS-46	Randolph	Red Run of Shavers Fork
MCS-22-A	Randolph	Stalnaker Run
MCS-22	Randolph	Taylor Run
MCS-40	Randolph	Whitmeadow Run
MCS-40	Randolph	Yokum Run
~~MCS~~	~~Randolph-Pocahontas~~	~~Shavers Fork (Headwaters) above Old Spruce~~
MCS-4	Tucker	Jobs Run
MCS-5	Tucker	Laurel Run of Shavers Fork
MCS-3-A	Tucker	South Branch of Haddix Run
MCS-7	Tucker	Stoneclick Run
~~MW~~	~~Harrison~~	~~Dog Run (Pond)~~
MW (L)-38-(1)	Lewis	Stonecoal Lake

MT-23-C	Barbour	Brushy Fork (Above Valley Furnace)
~~MT~~	~~"Barbour~~	~~Mill Run~~
MT-23-F	Barbour	Mill Run of Teter Creek
MT-23-H	Barbour	Mill Run of Teter Creek
~~MT~~	~~"Barbour~~	~~Teter Creek Lake (Impoundment)~~
MT-38	Barbour	Zebs Creek
MT-18-E-5-B	Preston	Frog Run
~~MT~~ MC-18	Preston	Roaring Creek (Above Little Lick Branch)
MT-12-D	Preston-Taylor-Monongalia	Laurel Run of Threeforks
MT-66-C	Randolph	Back Fork of Riffle Creek
MT-47	Randolph	Beaver Creek
MT-68	Randolph	Becky Creek from secondary Rt 56 bridge upstream
MT-68-A	Randolph	Big Branch of Becky Creek
~~MT~~	~~"Randolph~~	~~Big Run~~
MT-81	Randolph	Big Run of Tygart
MT-73	Randolph	Clay Run
MT-77	Randolph	Conley Run
~~MT~~	~~"Randolph~~	~~Elkwater Fork~~
MT-74	Randolph	Elkwater Fork above Mowry Run
~~MT~~	~~Randolph~~	~~Files Creek~~
MT-50	Randolph	Files Creek (Rt. FK-MT-50-A) from compressor station upstream
MT-64-C	Randolph	Glade Run
MT-72	Randolph	Hamilton
MT-50-B	Randolph	Left Fork of Files Creek
MT-50-A-1	Randolph	Limekiln Run
MT-74-B	Randolph	Limekiln Run of Elkwater
MT-80	Randolph	Logan Run
MT-44	Randolph	Mathais Run
MT-66-B	Randolph	McGee Run
MT-64-E	Randolph	Meatbox Run
MT-33	Randolph	Middle Form (Upper) above Cassity
MT-64	Randolph	Mill Creek upstream at end of Co. Rt. 46/4
MT-74-A	Randolph	Mowry Run
MT-64-F	Randolph	Potatohole Fork
MT-67	Randolph	Rafe Run
MT-78	Randolph	Ralston Run
MT-66	Randolph	Riffle Creek - above McGee Run
MT-45-C	Randolph	Right Fork of Chenoweth Creek
MT-61	Randolph	Shavers Run
MT-75	Randolph	Stewart Run
MT	Randolph	Tygart River (Above Huttonsville)
MT-79	Randolph	Windy Run
MT (T)-27-(1)	Taylor-Barbour	Tygart Lake Tailwaters (Above Route 119 Bridge)
~~MT~~	~~Upshur~~	~~Buckhannon River~~
MT M	Upshur	Right Fork of Middle Fork
MT B-32	Upshur-Randolph	Left Fork Buckhannon
MT B-31	Upshur-Randolph	Right Fork of Buckhannon
MTB-32-H	Randolph	Beech Run
MTB-31-I	Randolph	Devil Fork
~~MTB-32~~	Randolph	~~Left Fork of Buckhannon (Upper) upstream of Star Bridge~~

(No Code) MT-56?	Randolph	Millstone Run Right Fork of Files Creek
~~MTB-31~~	~~Randolph~~	~~Right Fork of Buckhannon (Head) above Pickens~~
MTB-31-C	Upshur	Alec Run
MTB-28	Upshur	Big Run of Buckhannon - about DLM drain
MTB	Upshur	Buckhannon River (Above Beans Mill)
~~MTB~~	~~Upshur~~	~~French Creek~~
MTB-32-E	Upshur	Lick Run
MTB-31-D	Upshur	Millsite Run
MTB-27	Upshur	Panther Fork (headwaters) - from 2 miles above Co. Rt. 32
MTB-31-B	Upshur	Reger Run
MTB-25-A	Upshur	Right Fork of Tenmile Creek - except lower ½ mile
MTB-32-D	Upshur-Randolph	Bearcamp Run
MTB - 31-F	Upshur-Randolph	Left Fork Right Fork
~~MTB~~	~~Upshur-Randolph-Lewis~~	~~Right Fork Buckhannon River~~
MTM-26	Randolph	Birch Fork of Middle Fork
MTM-16	Randolph	Cassity Fork (Upper) - above Mulberry Run
MTM-28	Randolph	Kittle Run
MTM-23	Randolph	Laurel Branch
MTM-22	Randolph	Laurel Run of Middle Fork
MTM-13	Randolph	Long Run
MTM	Randolph	Middle Fork River (Above Cassity)
MTM-27	Randolph	Mitchell Lick Fork
(No Code) MTM-16-?	Randolph	Panther Run of Cassity Fork (Upper) except lower 1/4 mile
MTM-21	Randolph	Pleasants Run
MTM-25	Randolph	Schoolcraft Run
MTM-24-A	Randolph	Spice Run
MTM-24	Randolph	Sugar Run
MTM-11-E	Upshur	Jenks Fork
MTM M-11	Upshur	Right Fork Middle Fork River
~~MTM-11~~	~~Upshur~~	~~Right Fork Middle Fork - above Hemlock~~
MTM-11-D	Upshur-Randolph	Jackson Fork
MY -5	Preston	Maple Run
MY -4	Preston	Rhine Creek
MY -2	Preston	Snowy Creek
MY	Preston	Youghiogheny River
No Code [redacted]	Pocahontas KNG-88-A-?	Sutton Run of North Fork of Deer Creek
No Code MTM-26-?	Randolph	Rocky Run of Birch Fork
No Code KG-60-?	Webster	Right Fork of Turkey Creek of Gauley

Little Kanawha River

LK-131	Upshur	Getout Run
LK - 115 - H	Upshur	Left Fork-Right Fork (Little Kanawha River)
LK	Upshur-Lewis	Little Kanawha River (Above Wildcat)

Kanawha River

K-80	Fayette	Falls Creek
K-76	Fayette	Loop Creek
K-65	Fayette	Paint Creek
~~K~~	~~Upshur~~	~~Left Fork of Right Fork Little Kanawha~~
KC-31-B	Boone	Hopkins Fork
KC-10-T-11	Boone	Spruce Laurel Fork
KC-10-A-7	Boone	West Fork of Pond Fork
KC-10	Kanawha	Little Coal River
KC-47	Raleigh	Clear Fork
KC-46	Raleigh	Marsh Fork
KC-46-G	Raleigh	Peachtree Creek
KE-69	Clay	
KE-102-A	Braxton	Groves Creek
~~KE~~	~~Braxton~~	Camp Creek (Centralia)
~~KE~~	~~Braxton~~	~~Sutton Lake Tailwaters (Above Route 38/5 Bridge)~~
KE-91	Braxton	~~Sutton Reservoir~~
KE-43	Clay	Wolf Creek (Centralia)
KE-50-I	Clay	Blue Knob Creek
KE	Clay	Rockcamp Run
KE	Kanawha	Strange Creek
KE-76-O	Nicholas	Blue Creek
KE-76-L-5	Nicholas	Poplar Creek
KE-135	Pocahontas	Tug Fork
KE-138	Pocahontas	Big Run of Elk
KE-139-B	Pocahontas	Big Spring Fork
KE-138-B	Pocahontas	Crooked Fork
KE-133	Pocahontas	Cup Run
~~KE~~	~~Pocahontas~~	Dry Branch
KE-137	Pocahontas	~~Elk River (Slaty Fork Section)~~
KE-136	Pocahontas	Laurel Run of Elk
KE-139-.5A	Pocahontas	Props Run
~~KE~~	~~Pocahontas,Randolph~~	Slaty Fork
KE-130	Randolph	~~Elk River~~
KE-129	Randolph	Chimney Rock Run
KE	Randolph-Webster	Valley Fork
~~KE~~	~~Webster~~	Right Fork of Leatherwood
KE-111	Webster	~~Back Fork~~
KE-127	Webster	Back Fork of Elk
~~KE~~	~~"Webster~~	Big Run of Elk
KE-98-B-16	Webster	~~Desert Fork~~
KE	"Webster	Desert Fork (Headwaters) above Roaring Run
KE-98-C-14	"Webster	Elk River (Above Webster Springs)
KE-102	Webster	Fall Run
~~KE~~	~~"Webster~~	Laurel Creek (Erbacon)
KE-98-C-11	Webster	~~Laurel Fork~~
KE-98-C	"Webster	Laurel Fork of Left Fork of Holly
~~KE-98-C~~	Webster	Left Fork Holly River
KE-111-K-2	Webster	~~Left Fork of Holly (Headwaters upstream of Rt 20 Bridge~~
~~KE~~	~~"Webster~~	Little Sugar Creek
KE-111-K	Webster	~~Sugar Creek~~
		Sugar Creek (Headwaters) above Little Sugar

KE-118	Webster-Randolph	Bergoo Creek
KC-31-B	Boone	Hopkins Fork
KC -44	"Raleigh	Marsh Fork (Above Sundial)
KC (4)-46-Q-(1)	Raleigh	Stephens Lake (Impoundment)
KG-19-I	Fayette	Brackens Creek
KG-19-A	Fayette	Dogwood Creek
KG	Fayette	Glade Creek
KG-6	Fayette	Rich Creek
No code KG-19-?	Fayette	Surbaugh Creek
KG	Fayette	Wolf Creek
KG-34-H-14	Greenbrier	Bear Run
KG-34-G-8	Greenbrier	Becky Run
KG-34-E-8	Greenbrier	Beech Run
KG-19-U	Greenbrier	Big Clear Creek
KG-34-G-13	Greenbrier	Big Run of South Fork of Cherry
KG-34-G-2	Greenbrier	Briery Run
KG-19-U-1	Greenbrier	Brown Creek
KG-34-H-5	Greenbrier	Coats Run
KG-34-G-10	Greenbrier	Cold Knob Fork
KG-34-E-13	Greenbrier	Cold Spring Branch
KG-34-G-5	Greenbrier	Elklick Run
KG-34-E-9	Greenbrier	Hogcamp Run
KG-34-F-2	Greenbrier	Improvement Branch
KG-19-U-2-D	Greenbrier	Job Knob Branch
KG-19-V-7	Greenbrier	Kuhn Branch
KG	"Greenbrier	Little Clear Creek and Laurel Run (KG-19-V, KG-19-V-5)
KG-34-E	Greenbrier/Nicholas	~~Laurel Creek (Headwaters) from McMillion Run upstream~~
KG	"Greenbrier	Meadow Creek
KG-34-E-11	Greenbrier	Middle Branch
KG-19-U-2-C	Greenbrier	Old Field Branch
KG-34-G-6	Greenbrier	Rocky Run
KG-19-U-3	Greenbrier	Sam Creek
KG-34-G	Greenbrier	South Fork of Cherry(Headwaters) downstream to Rocky Run
KG (4)-34-H-5-(1)	Greenbrier	Summit Lake (Impoundment)
KG -24	Greenbrier-Nicholas	Hominey Creek
~~KG~~	~~Greenbrier-Nicholas~~	~~Laurel Creek~~
KG -34-H	Greenbrier-Nicholas	North Fork Cherry River
~~KG~~	~~Greenbrier-Nicholas~~	~~South Fork Cherry River~~
~~KG~~	~~"Nicholas~~	~~Anglins Creek~~
KG-19-G	Nicholas	Anglins Creek (Headwaters) - 41/9 bridge upstream
KG-26-K	Nicholas	Brushy Creek
KG-24-E-2	Nicholas	Brushy Meadow Creek
KG -34	Nicholas	Cherry River
~~KG~~	~~Nicholas~~	~~Collison Creek~~
KG-20	Nicholas	Collison Creek
KG-32-J	Nicholas	Cranenest Run
KG -24-B	Nicholas	Deer Creek
KG-24-E	Nicholas	Grassy Creek
~~KG~~	~~Nicholas~~	~~Hominy Creek~~

~~KG-24~~	~~Nicholas~~	~~Hominey Creek (Middle)~~
~~KG-24~~	~~Nicholas~~	~~Hominey Creek (Lower)~~
~~KG-24~~	~~Nicholas~~	~~Hominey Creek (Upper)~~
KG -32	Nicholas	Panther Creek
KG -13	Nicholas	Peters Creek
KG-24-I	Nicholas	Price Fork
KG K(L)-82-(1)	Nicholas	Summersville Reservoir (Impoundment)
~~KG~~ K(T)-82-(1)	"Nicholas	Summersville Tailwaters (Above Collison Creek)
~~KG~~	~~Nicholas-Greenbrier~~	~~Laurel Creek of Cherry~~
KG34-F	Nicholas-Greenbrier	Little Laurel Creek
~~KG-34-H~~	~~Nicholas-Greenbrier~~	~~North Fork of Cherry~~
~~KG~~	~~Nicholas-Greenbrier~~	~~North Fork of Cherry~~
KG-34-H-4	Nicholas-Randolph	Hunters Run
(No Code) KG-34-H-4?	Pocahontas	Darnell Run of North Fork of Cherry
KGW	Pocahontas-Webster	Williams River
KGC	Pocahontas-Webster-Nicholas	Cranberry River
KG-73	Randolph-Pocahontas	North Fork of Gauley
KG-72	Randolph-Pocahontas	Middle Fork of Gauley
~~KG~~	~~Randolph-Webster~~	~~Gauley River Headwaters~~
~~KG~~	~~Randolph-Webster~~	~~Gauley River (Above Moust Coal Tipple)~~
KG-45	Webster	Big Laurel Fork
KG-59	Webster	Big Run of Gauley
KG-70	Webster	Big Run of Gauley
KG	Webster	Gauley River (Headwaters) above Jerryville
KG-61	Webster	Hughes Run
KG-58	Webster	Laurel Creek of Gauley
KG-57	Webster	Miller Mill Run
KG-67	Webster	Straight Creek of Gauley
KG-60	Webster	Turkey Creek
KG-65	Webster	Williams Camp Run

KGC-3	Nicholas	Jakeman Run
KGC-4-A	Nicholas	Little Barrenshe
KGC-4	Pocahontas	Barrenshe Run
(No code) KE	Pocahontas	Hawthorne Run or Jeffery Run of Big Spring Fork
KGC-24	Pocahontas	North Fork of Cranberry (Only the C&R Area)
KGC	Pocahontas	South Fork Cranberry River
KGC	Pocahontas-Webster-Nicholas	Cranberry River
KGC-19	Randolph	Dogway Fork
KGC-9	Webster	Aldrich Run
KGC-8	Webster	Foxtree Run
KGC-15	Webster	Hanging Rock Branch
KGC-7	Webster-Nicholas	Bee Run

KGW-26	Pocahontas	Black Mountain Run
KGW-25	Pocahontas	Day Run
KGW-20-A	Pocahontas	Lick Creek
KGW-22	Pocahontas	Little Laurel Creek
KGW-27	Pocahontas	Mountain Lick Run
KGW-21	Pocahontas	Sugar Creek
KGW-20	Pocahontas	Tea Creek

~~KGW~~	~~Pocahontas~~	~~Williams River above Day Run Campground~~
KGW-10	"Pocahontas-Webster	Middle Fork of Williams
KGW	Pocahontas-Webster	Williams River (Above Dyer)
KGW-1	Webster	Craig Run
KGW-2	Webster	Jonathan Run
KGW-9	Webster	Lick Branch
KGW-3	Webster	Sawyer Run
KGW-4	Webster	Spice Run
KGW-8	Webster	White Oak Fork
KN-23	Fayette	Buffalo Creek
KN-27-C	Fayette	Chestnut Knob Fork of Laurel
KN-22	Fayette	Dunloup Creek ~~(Downstream from Harvey Sewage Treatment Plant)~~
KN-17-A	Fayette	Glade Creek of Manns
KN-15	Fayette	Keeney Creek
~~KN~~	~~"Fayette~~	~~Laurel Creek (Above Cotton Hill)~~
KN-27	Fayette	Laurel Creek of New River
KN ~~-22~~ KN-22-B	Fayette	~~Meadow Fork Creek~~ Meadow Fk of Dunlap Cr.
KN-7	Fayette	Mill Creek
~~KN~~	~~Fayette~~	~~Mill Creek of New River~~
KN-60	Mercer	East River (Above Kelleysville)
KN-60-B	"Mercer	Pigeon Creek
KN-51-I	Monroe	Laurel Creek
KN-61	Monroe	Rich Creek
KN-51-Q	"Monroe	Turkey Creek
KN-26-F	Raleigh	Beaver Creek
~~KN~~	~~Raleigh~~	~~Dunloup Creek~~
KN-26-B	Raleigh	Fat Creek
~~KN~~	~~Raleigh~~	~~Glade Creek~~
KN-29	Raleigh	Glade Creek of New River
KN-29-E	Raleigh	Pinch Creek
KN-26	Raleigh	Piney Creek
KN-32	Summers	Meadow Creek
KNB-30	Mercer	Crane Creek
KNB-12-B	Mercer	Laurel Creek (Bluestone)
KNB-3	Summers	Little Bluestone
KNG-28	"Greenbrier	Anthony Creek (Above Big Draft)
KNG(S)-3-A	Greenbrier	Burns Run
KNG	Greenbrier	Culverson Creek
KNG(S)-2-B	Greenbrier	Flynn Creek
KNG	Greenbrier	Hughart Creek
KNG(S)-1	"Greenbrier	Milligan Creek
~~KNG(S)-1~~	~~Greenbrier~~	~~Milligan Creek - upstream of old Rt. 60~~
KNG-28-Q	Greenbrier	North Fork Anthony Creek
KNG-(S)-3-C-1	Greenbrier	Roaring Creek
KNG ~~-28~~ KNG-(S)-2	Greenbrier	Sinking Creek KNG(S)-2
KNG-30	"Greenbrier	Spring Creek
KNG-28-Q-2	Greenbrier	Twomile Run

~~KNG~~	~~Greenbrier-Monroe~~	~~Second Creek (Rt. 219 Bridge to Nickell's Mill)~~
KNG-23	Greenbrier-Monroe	Second Creek - a 2 mile section around Rodgers Mill (Fly Fishing Only section)
KNG-23-H	Monroe	Kitchen Creek (Above Gap Mills)
KNG-78-L	"Pocahontas	Abes Run
KNG-53-G	Pocahontas	Barclay Run
KNG-47	"Pocahontas	Beaver Creek
KNG-68-A-5	Pocahontas	Black Run
KNG(L)-78-C-1-(1)	"Pocahontas	Buffalo Fork (Impoundment)
KNG-79-C-2	Pocahontas	Club House Run
KNG-68	"Pocahontas	Deer Creek
KNG-53-H	Pocahontas	Douthat Creek
KNG-78	Pocahontas	East Fork of Greenbrier
~~KNG-78~~	~~Pocahontas~~	~~East Fork Greenbrier River (Head) above Abes Run~~
KNG-68-A-6	Pocahontas	Elleber Run
KNG-79-B	Pocahontas	Fill Run
KNG-78-G	"Pocahontas	Five Mile Run
KNG	"Pocahontas	Greenbrier River (Above Hosterman)
KNG-68-A-6	Pocahontas	Griffin Run
KNG(S)-4	"Pocahontas	Hills Creek KNG(S)-4
KNG-78-A	Pocahontas	Johns Run
KNG-53	"Pocahontas	Knapp's Creek
KNG-60	Pocahontas	Laurel Run of Greenbrier
KNG-70	Pocahontas	Leatherbark Run
~~KNG~~	~~"Pocahontas~~	~~Little River East Fork~~
KNG-78-C	Pocahontas	Little River of East Fork (Head) downstream to Buffalo Fork
~~KNG~~	~~"Pocahontas~~	~~Little River West Fork~~
KNG-79-C	Pocahontas	Little River of West Fork (Head) first low water bridge
KNG-38	Pocahontas	Locust Creek
KNG-78-H-1	Pocahontas	Long Run
KNG-78-K	"Pocahontas	Mullenax Run
~~KNG~~	~~"Pocahontas~~	~~North Fork Deer Creek (Above Route 28/5)~~
KNG-68-A	Pocahontas	North Fork of Deer Creek - FS bridge below Sutton Run
KNG-78-H	Pocahontas	Poca Run
KNG-23-C	Pocahontas	Red Run of South Fork of Cranberry
KNG(L)-59-D-(1)	"Pocahontas	Seneca (Impoundment)
KNG-66-D	Pocahontas	Shock Run
KNG-66	"Pocahontas	Sitlington Creek
KNG-79-C-1	Pocahontas	Spanoak
KNG-55	"Pocahontas	Stoney Creek
KNG-49	"Pocahontas	Swago Creek
KNG-68-A-4	Pocahontas	Tacker Fork
KNG-59	Pocahontas	Thorny Creek
KNG-74	Pocahontas	Trout Run of Greenbrier
KNG(L)-43-(1)	Pocahontas	Watoga Lake
KNG-79	Pocahontas	West Fork Greenbrier
~~KNG~~	~~"Pocahontas~~	~~West Fork Greenbrier River (Above the impoundment at the tannery)~~
~~KNG-79~~	~~Pocahontas~~	~~West Fork of Greenbrier (Head) above Wildell~~

No Code	Randolph	White Run of East Fork of Glady
KNB -13	"Mercer	Camp Creek
KNB -13 -0	Mercer	Marsh Fork
OG -76	Logan	Big Huff Creek
OG -134	Raleigh-Wyoming	Slab Fork
OG -100 - ?	Wyoming	Laurel Fork of Clear Fork
OG -124	Wyoming	Pinnacle Creek creek

Tug Fork of Big Sandy River

~~BST~~	~~McDowell~~	~~Dry Fork (Above Canebrake)~~
BST -70	McDowell	Dry Fork of Tug
BST -99	McDowell	Elkhorn Creek
~~BST-99~~	~~McDowell~~	~~Elkhorn Creek - downstream to North Fork~~
BST-70-W	McDowell	Jacob Fork

United States Department of the Interior

NATIONAL PARK SERVICE

NEW RIVER GORGE NATIONAL RIVER
GAULEY RIVER NATIONAL RECREATION AREA
BLUESTONE NATIONAL SCENIC RIVER
104 Main Street
P.O. Box 246
Glen Jean, West Virginia 25846

IN REPLY REFER TO:

N3617(NERI)

June 23, 2003

RECEIVED
JUN 23 2003
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

West Virginia Environmental Quality Board
1615 Washington Street East
Suite 301
Charleston, WV 25311-2126

Dear Sirs:

The National Park Service wishes to express its concern with the proposed amendments to the Requirements Governing Surface Water Quality Standards rule that were filed with the West Virginia Secretary of State and the Legislative Rule Making Review Committee on May 19, 2003.

Our concern involves the proposed change in the bacteria standard for Primary Contact Recreation (Category C). In Appendix E, Table 1, the relevant standard is number 8.13 in the current rule, and number 76.a in the proposed rule. The proposed rule incorporates the existing fecal coliform standard, but adds an additional standard using Escherichia coli (noted as Escheria Coli in Appendix E, Table 1 of the proposed rule). If a sample shows noncompliance with the fecal coliform standard, it is proposed that the original sample be subsequently evaluated against the E. coli standard. There are several problems with this approach.

First, the 24-hour incubation time required for the fecal coliform method will not allow the original sample to be reliably tested for E. coli. According to American Public Health Association (Standard Methods for the Examination of Water and Wastewater), microbiological sample examination should begin within 6 hours of sample collection.

Second, allowing "further testing" to "determine compliance" delays the reporting of noncompliance by at least 48 hours, and in many cases 72 hours, from initial sampling. Because of the 24-hour incubation required for both methods, results from a sample are not available until 24-30 hours after sample collection. If a second sample is required to determine noncompliance, it cannot be collected until after examination of the first sample reveals that it exceeds the standard.

The National Park Service collects and analyzes samples for fecal coliform bacteria from approximately 40 sites over a four county area that encompasses the three parks that we manage (New River Gorge National River, Gauley River National Recreation Area, and Bluestone

National Scenic River). Due to travel times and sample processing requirements, sampling all of these sites takes 6 different sample collection runs. If a sample is collected on Monday at 9:00 AM, and returned to the lab and processed beginning at 2:00 PM, the results will not be available until at least 3:00 PM on Tuesday. Because it is now too late to collect additional samples and begin processing on Tuesday, the subsequent sample must be collected on Wednesday, and the results will then not be available until Thursday afternoon.

Monitoring by the National Park Service and numerous other organizations has shown that sewage pollution in running waters, as measured by fecal coliform bacteria or other methods, is highly dependent on hydrologic regime. Usually, this is manifested by higher fecal densities being associated with higher stream discharges. However, this relationship is not linear. For a given discharge, fecal densities are usually higher on the rising limb of a hydrograph (as the water level rises), and lower on the declining limb (as the water level falls). Rising limbs rarely last for more than a few hours on small streams, and even on large rivers they rarely last more than one day. Therefore returning two days later, or even one day later, to an area that exhibited noncompliance will not be sampling the same conditions.

Third, the National Park Service is concerned about the perception that using the proposed standard to determine noncompliance will have on water quality in West Virginia, and especially in the above-noted three park units that receive heavy recreational use. It appears that the proposed standard will result in reduced incidences of noncompliance. This may lead to the perception that water quality has improved, when in fact there has been no improvement in water quality. If this false perception persists, there will be less incentive to improve water quality, and less impetus for correcting the widespread delivery of untreated sewage to West Virginia streams.

The U. S. Environmental Protection Agency (EPA) recommends the use of E. coli (or enteroccci) for determining sewage pollution for contact recreation (Ambient Water Quality Criteria for Bacteria – 1986, EPA440/5-84-002, 1986). This recommendation is based on a greater reliability of this method (versus the fecal coliform method) for associating the incidence of gastrointestinal illness with exposure to various levels of microbiological contamination. More recent studies have supported this opinion (Draft – Implementation Guidance for Ambient Water Quality Criteria for Bacteria – 1986, EPA-823-D-00-001, 2000). This latter document also provides EPA's recommended approach for States making the transition from fecal coliforms to E. coli and/or enterococci.

The National Park Service suggests that the Environmental Quality Board adopt the E. coli standard as presented by the EPA. Recent research has shown a high correlation between fecal coliform levels and E. coli levels (U. S. Geological Survey Water-Resources Investigations Report 03-4055 and 03-4056, both published in 2003). Therefore a transition to the EPA-preferred method would reduce the value of existing fecal coliform data. Acceptable alternatives include a one- to five-year transition to the E. coli standard, or allowing the use of either of fecal coliforms, E. coli, or enterococci, according to the appropriate EPA guidance for each method.

Thank you for the opportunity to comment on this proposed rule. For additional information, please contact our aquatic resources specialist, Jesse M. Purvis, Ph.D., at 304-465-6513.

Sincerely,

Calvin F. Hite

Calvin F. Hite
Superintendent

cc:
Keith Everett, ARD, Resource Stewardship and Science
Bill Jackson, Chief, Water Operations Branch, Water Resources Division
Randy Boyd, Plateau Action Network

United States Department of the Interior

FISH AND WILDLIFE SERVICE
West Virginia Field Office
694 Beverly Pike
Elkins, West Virginia 26241

June 17, 2003

RECEIVED
JUN 17 2003
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

Dr. Edward M. Snyder, Chair
West Virginia Environmental Quality Board
1615 Washington Street, East
Charleston, West Virginia 25311-2126

Dear Dr. Snyder:

The U. S. Fish and Wildlife Service (Service) is providing comments for the West Virginia Environmental Quality Board (WVEQB) May 8, 2003 proposed water quality standard rule. We are submitting the following information in accordance with section 303(c)(2) of the Clean Water Act (CWA). the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 15 U.S.C. 661 et seq.) and the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Appendix E, Table 1 — Nitrite Aquatic Life Criteria

The WVEQB has proposed the removal of the aquatic life criteria for nitrite. Nitrite is produced as an intermediate compound in the nitrification process. In this biological process, Nitrosomonas bacteria convert ammonia to nitrite and Nitrobacter converts nitrite to nitrate. The effectiveness of the conversion of nitrite to nitrate is dependent on several factors, including pH, temperature, dissolved oxygen, concentration, number of nitrifying bacteria, nitrous acid, and un-ionized ammonia, and the presence of both ameliorating and inhibitory compounds (Russo 1980; Lewis and Morris 1986).

Under normal circumstances, the conversion of nitrite to nitrate is relatively rapid and nitrite is present in only trace amounts in natural waters. In wastewater treatment plants, total ammonia exist as both ammonium (NH_4) and un-ionized ammonia (NH_3). However, if pH of waste waters increase, either naturally or by addition of a base, the concentration of un-ionized ammonia will increase. Un-ionized ammonia concentrations of 0.1 to 1.0 mg/l inhibit nitrobacters and nitrosomonads. Barica (1990) investigated ammonia and nitrite levels in Hamilton Harbor of Lake Ontario and reported that concentrations of toxic un-ionized ammonia depended on ammonia loadings from sewage treatment plants, seasonal nitrogen cycle, pH, and water temperature. He found nitrite concentrations exceeded the International Joint Commission chronic toxicity thresholds of .03 mg/l for most of the summer and often surpassed the cold-water fish toxic level of 0.25 mg/l. Nitrite levels were 0.60 to 1.2 mg/l near the outfall of a sewage treatment plant.

Russo and Thurston (1974) found nitrite levels of approximately 0.1 mg/l below a sewage treatment plant in a cold water stream in Montana. Schmidt et al. (1999) measured monthly nitrite concentrations for a one year period below a sewage treatment plant outfall that received waste water from an average population equivalent of 7,700, with 33% originating from industry. They found average monthly nitrite values ranging from 0.2 to 1 mg/l. Fish exposed to sublethal concentrations of nitrite exhibit gill damage and degenerative changes in liver (Arillo et al., 1984; Laurent and Perry, 1991).

Organic compounds often found in significant concentrations in industrial waste inhibit the nitrification process, resulting in higher concentrations of nitrite (Russo 1980; Mazik et al. 1991). Dodecylamine, aniline, and n-methylaniline at concentrations of less than 1 mg/l can cause 50 percent inhibition of ammonia oxidation by Nitrosomonas. Nitrate oxidation by Nitrobacter is inhibited by concentrations of 100 mg/l of p-nitrobenzaldhyde, p-nitroaniline, and n-methylaniline (Russo 1980). Aniline is listed in the West Virginia Toxic Release Inventory (NICS 2002), and in January 21, 2002, the Bayer Corporation at New Martinsville, West Virginia reported production of 40 million tons of aniline (Chem Profiles 2002). Patrick et al (1979) reported that Klingler (1959) found nitrite concentrations of 30 mg/l and higher in receiving waters from metal, dye, and celluloid industries. Potentially, compounds that inhibit the nitrification process are present in West Virginia's industrial waste-water stream.

Nitrite toxicity to aquatic life is dependent on chloride concentrations. Russo and Thurston (1977) found that increased concentrations of chloride resulted in decreased nitrite toxicity to rainbow trout (Oncorhynchus mykiss), and that the effect was linearly correlated. Crawford and Allen (1977) reported that increased calcium concentrations decreased nitrite toxicity to chinook salmon (Oncorrhynchus tshawytscha). Toxicity of nitrite to fishes is highly dependent on the chemical composition of the water (Russo 1980).

Reviewing work by Klinger (1959), Russo and Thurston (1977) reported that 10 mg/l nitrite was fatal to dace (Phoxinus laevis) after a 14-day exposure. Nitrite concentrations of 10 mg/l, in a 3 mg/l chloride media, was fatal to Gila trout (Oncorhynchus gilae), during a 96-hour exposure (Fuller et al. 2003). Rainbow trout (Oncorhynchus mykiss) exposed to 0.45 mg/l environmental nitrite for 24 hours accumulated nitrite about 15 times over the environmental concentration. Nitrite accumulation increased along with exposure time and was correlatable with trout physiological condition. Trout near death showed blood nitrite concentrations 60 times greater than nitrite in their environment. Trout concentrated nitrite against the gradient, even when nitrite levels were 20 times higher in the trout than in the environment (Margiocco et al 1983).

Nitrite toxicity literature, through 1977, was summarized by Russo and Thurston (1977). They reported that in short-term (less than four days) nitrite exposures of 0.2 mg/l is lethal to several fish species with trout and salmonids being the most sensitive. Short-term exposures of 2 to 15 mg/l were lethal to fathead minnows (Pimephales promelas) and channel catfish (Ictalurus punctatus). Creek chubs (Semotilus atromaculatus), carp (Cyprinus carpio), common white suckers (Catostomus commersoni), quillback (Carpiodes cyprinus), and mottled sculpins (Cottus bairdi) survived short-term exposures to nitrite concentrations ranging from 67 to 100 mg/l (Russo 1980). In a review of the U. S. Environmental Protection Agency's (USEPA)

recommended nitrite criteria, Patrick et al. (979) reported that a 10-day bioassay is not long enough to identify nitrite chronic effects and recommended longer-term testing.

In 1986, Lewis and Morris summarized nitrite LC50 data for all fish species on which there was published literature. They found nitrite 96-hour LC50 values for rainbow trout (Oncorhynchus mykiss), channel catfish (Ictalurus punctatus), black bullhead (Ictalurus melas), fathead minnow (Pimephales promelas), creek chub (Semotilus atromaculatus), common white sucker (Catostomus commersoni), and largemouth bass (Micropterus salmoides) ranged from 3.6 to >100 mg/l, when corrected to 20 mg/l chloride. However, 96-hour LC50 values for those species ranged from 0.15 to 140 mg/l when chloride concentrations ranged from 0.24 to 38 mg/l. They concluded that salmonids are among the most sensitive to nitrite but there is variation in nitrite sensitivities among warmwater fish taxa. Channel catfish are as sensitive to nitrite as salmonids, while minnows, bullheads and sculpins are considerable less sensitive. Sunfish, including largemouth bass (Micropterus salmoides) are especially insensitive to nitrite.

Marco et al. (1999) studied the effects of nitrite on newly hatched larvae of Oregon spotted frog (Rana pretiosa), red-legged frog (Rana aurora), Western toad (Bufo boreas), Pacific treefrog (Hyla regilla), and northwestern salamander (Ambystoma gracile). They found the 15-day LC50 values for these species ranged from 0.57 to 1.75 mg/l (all tests were conducted in dechlorinated water). They reported that all species showed a high mortality at the USEPA recommended limits of 5 mg/l for warm-water fishes and a significant larval mortality at USEPA's recommended limit of 1.0 mg/l for drinking water (USEPA 1986). These findings are significant because of the observed worldwide decline in amphibian populations.

The 1986 USEPA (USEPA 1986) Guidance Document states that nitrite concentrations at or below 5 mg/l should be protective of warmwater fish and nitrite at or below 0.06 mg/l should be protective of salmonids. The 1986 document provides scientific rationale that supports those recommendations. USEPA guidance for 2002 (USEPA 2002) does not include nitrite criteria but the Service is unable to locate USEPA rationale for excluding nitrite aquatic life criteria. McDonald (1994) reported nitrite aquatic life water quality criteria ranging from 0.010 to 0.6 mg/l in Europe, British Columbia and Russia.

In summary, nitrite is toxic to aquatic species at concentrations ranging from 0.2 to >100 mg/l. Some fish species bio-accumulate nitrite, against the environmental nitrite gradient. Toxicity depends upon aquatic species tolerances and chemical parameters present in surface waters that may increase or decrease nitrite toxicity. Chemical wastewater effluents that contain p-nitrobenzaldhyde, p-nitroaniline, and n-methylaniline or waste products from metal, dye, and celluloid industries may result in toxic nitrite concentrations. High organic inputs (eg. sewage treatment facilities, meat processing out-falls, fish hatchery out-falls) can provide environments that increase the risk of nitrite toxicity to aquatic life. Nitrite levels must be administratively managed to be protective to the most sensitive resident organism. Therefore, the Service recommends retaining the current nitrite criteria for aquatic life in State water quality standards. If the nitrite criteria is removed, the Service request an opportunity to review the scientific information used to support the removal.

Section 8.32.2— Turbidity

The numeric criterion for turbidity states that the criterion shall not apply to activities where an approved Federal or State Surface Mining Permit is in effect. The Board is considering a recommendation that proposes the removal of the turbidity exemption for surface mining. On April 11, 2003 the Service provided comments to WVEQB on the effects of turbidity and our recommendation regarding the surface mine exemption. You will find those comments in Attachment 1

We appreciate the opportunity to provide comments during the Triennial Review. If you have any questions or require additional information, please contact me directly, or Dan Ramsey of my staff at (304) 636-6586.

Sincerely,

Thomas R. Chapman
Field Supervisor

Literature Cited

Arillo, A. E. E. Gaino, C. Margiocco, P. Mensi. And G. Schenone. 1884. Biochemical and ultrastructural effects of nitrite in rainbow trout: liver hypoxia as the root of the acute toxicity mechanism. Environ. Res. 34:135-154.

Barica, J. 1990. Ammonia and nitrite contamination of Hamilton Harbour, Lake Ontario. Water. Pollut Res. J. 25(3):359-386.

Chemical Profiles. 2002. Website: www.the-innovation-group.com/Chemprofiles/Aniline.htm.

Crawford, R. E. and G. H. Allen. 1977. Seawater inhibition of nitrite toxicity to chinook salmon. Trans. Amer. Soc. 106(1): 105-109.

Fuller, S. A., J. P. Henne, G. J. Carmichael, and J. R. Tomasso. 2003. Toxicity of ammonia and nitrite to the Gila trout. N. Amer. J. Aquaculture 65(2)162-164.

Klinger, K. 1959. Sodium nitrate, a slow-acting fish poison. Wat. Pollut. Abstr. 32:142.

Lewis, W. M. and D. P. Morris. 1986. Toxicity of nitrite to fish: a review. Trans. Amer. Fish. Soc. 115(3):183-195.

Laurent, P. and S. F. Perry. 1991. Environmental effects on fish gill morphology. Phys. Zoo. 64:4-25.

Marco, A., C. Quilchano, and A. R. Blaustein. 1999. Sensitivity to nitrate and nitrite in pond-breeding amphibians from the Pacific northwest. Environ. Toxicol. Chem 18(12):2836-2839.

Margiocco, C., A Arillo, P. Mensi, and G. Schenone. 1983. Nitrite bioaccumulation in Salmo gairdneri Rich, and hematological consequences. Aquat. Toxicol 3:261-270.

Mazik, P. M., M. L. Hinman, D. A. Winkelman, S. J. Klaine, B. A. Simco, and N. C. Parker. 1991. Influence of nitrite and chloride concentrations on survival and hematological profiles of striped bass. Trans. Amer. Fish. Soc. 129:247-254.

McDonald, D. D. 1994. A review of environmental quality criteria and guidelines for priority substances in the Fraser River Basin. Environment Canada. North Vancouver, B. C., DOE FRAP 1994-30.

NICS 2002. West Virginia Scorecard 2000-2001, The toxic release inventory in West Virginia. National Institute for Chemical Studies.

Patrick, R., J. E. Holt, R. E. Crawford, B. A. Manny, R. C. Russo, R. V. Thruston, and G. A. Wedemeyer. 1979. A review of the EPA red book: quality criteria for water. R. V. Thurston, R. C. Russo, C. M. Fetterolf, Jr., T. A. Edsall, and Y. M. Barber, Jr., editors. Red Book Review Scoring Committee. Water Quality Section, Amer. Fish Soc., Bethesda, Maryland.

Russo, R. C. 1980. Recent advances in the study of nitrite toxicity of fishes. Pages 226-240 in W. R. Swain and V. R. Shannon, editors. Proceedings of the 3rd USA-USSR symposium on the effects of pollutants upon aquatic ecosystems: theoretical aspects of aquatic toxicology. U. S. Environmental Protection Agency, EPA-600/9-80-034, Duluth, Minnesota.

Russo R. C. and R. V. Thurston. 1977. The acute toxicity of nitrite to fishes. Pages 118-131 in R. A. Tubbs, editor. Recent advances in fish toxicology.

Schmidt, H., D. Bernet, T. Wahli, W. Meir, and P. Burkhardt-Holm. 1999. Active biomonitoring with brown trout in diluted sewage plant effluents. J. Fish Biol. 54:585-596.

USEPA. 1986. Quality criteria for water 1986. EPA 440/5-86-001. Office of Water Regulations and Standards, Washington, DC.

USEPA 2002. National recommended water quality criteria: 2002. EPA-822-R-02-047. Office of Water/Science and Technology, Washington, DC.

cc:
USEPA-Cheryl Atkinson
USFWS-Dave Densmore
Reader File
Project File

ATTACHMENT 1

United States Department of the Interior

FISH AND WILDLIFE SERVICE

West Virginia Field Office
694 Beverly Pike
Elkins, West Virginia 26241

FILE COPY

April 11, 2003

Dr. Edward M. Snyder, Chair
West Virginia Environmental Quality Board
1615 Washington Street, East
Charleston, WV 25311-2126

Dear Dr. Snyder:

The U.S. Fish and Wildlife Service (Service) has reviewed issues being considered for revision in West Virginia's 46 CSR 1, *Requirements Governing Water Quality Standards*. We are submitting the following comments in accordance with Section 303(c)(2) of the Clean Water Act (CWA), the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 15 U.S.C. 661 et seq.) and the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Harmonic Mean Flow

During West Virginia Environmental Quality Board (WVEQB) meetings, there have been proposals and discussions of adopting harmonic mean flow for development of NPDES (National Pollution Elimination System) effluent limitations for carcinogens for Human Health Category A waters. Presently, the West Virginia Division of Environmental Protection (WVDEP) uses 7Q10 design flow to calculate effluent limitations for those parameters for both Water Use Categories A and B. Nominally, the proposal to adopt harmonic mean flow is for Category A waters, however, adoption of that design flow could result in increased pollutant levels of some parameters and could impact aquatic organisms, including threatened and endangered species.

During the early 1990's, there was considerable debate and data generated on the consequence of adoption of harmonic mean flow. Some data showed that carcinogens discharged to State waters would be increased five to seven times if harmonic mean flows were used instead of 7Q10 design flows (Carpenter Environmental Associates 1993). The U. S. Environmental Protection Agency (USEPA) compared harmonic mean flows to 7Q10 flows in 60 randomly selected streams throughout the country. They reported that harmonic mean flows of all 60 streams were equal to or greater than two times their 7Q10 flows. Fifty-four of the stream's harmonic mean flows were equal to or greater than 2.5 times their 7Q10 flows. Forty of the 60 stream's harmonic mean flows were equal to or greater than 3.5 times the 7Q10 (USEPA 1991). EPA does not report the

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number of streams that had higher harmonic mean flows than 7Q10 flows, but harmonic mean flows in some streams were 2 to 3.5 times higher than 7Q10 flows. Designing effluent limits for higher flows will result in greater pollution loading for some waters.

Presently, there are approximately 27 regulated parameters that are considered carcinogenic and some are toxic and bio-accumulative to aquatic organisms. Many of those constituents have no numeric criteria in West Virginia's Water Quality Standards to protect Category B uses. Dioxin is toxic and bio-accumulative to both aquatic and to terrestrial biota that rely on aquatic food sources. Water column concentrations of dioxin that would be protective of aquatic organisms and organisms that feed on aquatic biota are often measured in parts per quadrillion. A large volume of information concerning toxicity of dioxin has been collected by the Service and we would be glad to provide that information to the board.

The 96-hour LC50 for hexachlorobenzene (HCB) has been reported as 12 mg/l for largemouth bass (USFWS 1980). Largemouth bass are host fish for the glochidial stage of the endangered pink mucket pearlymussel (Lampsilis abrupta). HCB is also toxic to fathead minnow (Pimephales promelas), channel catfish (Ictalurus punctatus), and bluegill (Lepomis macrochirus), at levels (LC-50) of 22 mg/l, 14 mg/l, and 12 mg/l, respectively (USFWS 1980). Green sunfish bioconcentrate HCB approximately 22,000 times (USEPA 1988). Acute toxicity values for a variety of aquatic species is reported by USEPA (1988). HCB is also toxic to birds (Briggs 1992), and could cause adverse effects to the threatened bald eagle (Haliaeetus leucocephalus) that feed on fish.

Polycyclic aromatic hydocarbons (PAH) include, but are not limited to, naphthalene, acenaphtrene, anthracene, and pyrene. Concentrations of naphthalene is toxic (27-day LC50) to rainbow trout at 110 ug/l. Chironomids experienced 2-day LC50 effects when exposed to 60 ug/l acenaphtrene and concentrations of 91 ug/l pyrene caused toxicity (48-hr LC50) to *Daphnia*. (Government of Canada 1994). Toluene, trichloroethylene, tetrachloroethylene, and 1, 1, 2, 2-tetrachloroethane are toxic to a variety of aquatic species, including Daphnia, fathead minnow (Pimephales promelas), and rainbow trout (Oncorhynchus mykiss) (Government of Canada 1992, 1993a, 1993b, 1993c).

Adoption of harmonic mean flow as the design flow to set effluent limitations for Category A use, for which there are no Category B use criteria, could result in increased loading of chemicals that are toxic and bioaccumulative to aquatic biota. This could impact aquatic life, threatened and endangered species and result in impacts to designated and/or existing uses.

To determine the advisability of adopting harmonic mean design flow, the Service recommends an analysis be performed, using harmonic mean flow design (or any new design flows), to determine the level of releases of all parameters that are regulated for Category A use, and are toxic to aquatic biota, but unregulated for Category B use. This assessment is particularly important for those compounds that are bio-accumulative. Assessments should also be conducted on the affects of those parameters to body burdens of aquatic organisms and to organisms that rely on aquatic food sources, including but not limited to, fish, mink, mussels, and eagles.

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We have some significant concerns regarding adoption of a new design flow. In 2001, the Service and USEPA developed a Memorandum of Agreement (MOA) (USEPA 2001). An important component of the MOA was enhanced Federal coordination for Clean Water Act and Endangered Species Act issues during development of new or revised water quality standards (Section (A)(2)). In the spirit of the MOA, we will be discussing our concerns with USEPA. We hope that the State will participate in that dialog and that we can reach agreement on appropriate design flows.

Aluminum

The acute and chronic aquatic life water quality criteria is presently 750 ug/l and 87 ug/l, respectively, for dissolved aluminum with a conversion factor of one. Research conducted in Pennsylvania streams has shown that these values, expressed as total aluminum, may not be sufficiently protective for fish in some streams (Dr. William Sharpe, personal communication).

There are at least six forms of aluminum that can be present in waters, depending on the pH and a variety of other factors. In establishing aluminum criteria, the interaction of pH should be considered. This interaction has been recognized in Canada. Canadian water quality guidelines limit aluminum concentrations to 5 ug/l in waters with pH of 6.5, or below (cited in Wren and Stephenson 1991). Brodeur J. C. et al. (2001) found that a 36-day exposure of salmon to waters with a pH of 5.2 and total aluminum concentrations of 50 ug/l had a sub-lethal effect that altered the fish energy budget resulting in weight loss. An aluminum study in Choptank River, Maryland revealed that aluminum concentrations during a year of high rainfall were two to five times higher than a low rainfall year (USEPA 1990).

Aluminum toxicity in some fish species is bimodal, in that it causes asphyxiation at higher levels (approximately 5.5 to 6.5) and interferes with electrolyte balance at lower pH. Because of this bimodal toxicity, reduction of surface water acidity through liming or by mixing low and high pH waters may actually increase fish mortality at the point of mixing (Sparling and Lowe 1996; Poleo, A. B. S. et al. 1994). Vuorien M. V. et al. (1993) demonstrated different tolerances of three fish species in varied combinations of pH and aluminum

A large number of the West Virginia streams are small infertile streams that exhibit significant variations in seasonal pH values. For example, reproducing native brook trout streams and small warmwater streams exhibit seasonal pH variations from 4.9 to 6.0 (personal observation). Those streams would be in potential jeopardy if criteria are set that result in increased aluminum loading. Aluminum is precipitated as pH increases, however, aluminum can be mobilized from surface sediments and elevated concentrations can readily be attained if a seasonal flush of acidified water occurs (LaZerte, B. 1986).

The Service and USEPA have discussed the problems of setting appropriate aluminum criteria and have agreed that the major problem in setting aluminum criteria is the conflicting results in a large number of studies. For example, the Service has collected results of approximately 100 aluminum studies. The Service recommends a through review of studies be completed and that the criteria be established based on the preponderance of scientific findings.

Specific Comments

The Service has reviewed Triennial Review comments submitted by WVDEP and offer the following comments and recommendations based on that review:

Section 2.20 and Section 4.1.c

WVDEP has stated that there is confusion with respect to the definition of "Trout waters"(Sect 2.20) and language defining waters that receive protection under Tier 2.5 (Sect. 4.1.c) in the Antidegradation Policy (46-1-4).

"Trout waters" are defined as streams that sustain year-round trout populations and exclude streams which receive annual stockings of trout but that do not support year-round trout populations. Those waters are assigned the designated use of "B-2" (Section 6.3.b) and specific protective numeric criteria for that use are found in Appendix E of the water quality standards. Within the Antidegradation Policy, it is recognized that naturally reproducing trout streams are especially valuable and are therefore designated waters of "special concern" and considered Tier 2.5 waters for the purpose of an antidegradation review. However, the Tier 2.5 designation for streams with naturally reproducing trout populations does not require more protective numeric criteria that those provided for use category B-2.

Streams that are stocked with trout, but do not have naturally reproducing trout populations are assigned a designated use of "B-2" (warmwater) and specific numeric criteria for that use is also found in Appendix E of the water quality standards. It seems inappropriate to designate a stocked trout stream as a warmwater stream. Adult trout, whether from stockings or from natural reproduction, would require the same numeric criteria protection. The Service recommends that the EQB consider providing stocked trout streams appropriate numeric criteria protection, at least through the trout stocking periods, and that stocked trout streams be designated as Tier 2.5 for the purpose of antidegradation reviews.

Section 2 (Proposed New Definition For "Aquatic Life")

WVDEP has commented that there is no clear definition of "aquatic life" throughout the rule and suggested the following definition:

> "Living organisms that require residency in freshwater systems (e.g. springs, ponds, lakes, streambeds and rivers) to complete their life cycles"

The Service has concerns in attempting to provide a "one-size-fits-all" definition of aquatic life. An obvious problem would be a definition that could protect exotic or invasive species, that could result in lost of existing use. Aquatic organisms and communities that should be identified in establishing designated or existing uses vary between types of waters, stream gradient or order, water temperature, lake trophic condition, geology, etc. One of the stated goals of the Clean Water Act is to restore and maintain the biological integrity of the Nation's waters. Biological integrity may vary among water bodies and may be dependent on different aquatic groups.

USEPA (1994) guidance recognizes that a biological inventory to establish existing use should be conducted on a case-by case basis, from which it may be possible to establish an understanding of broader faunal groups. USEPA defines "aquatic community" as "an association of interacting populations of aquatic organisms in a *given water body or habitat*" (emphasis added). The Service believes that continued biological assessments of the State's waters to establish existing uses will appropriately identify "aquatic life" life that should be protected, in order to preserve the existing uses.

Section 7.2.c.4

This section has been expanded and provides guidelines for determining natural conditions for a waterbody. DEP has pointed out that when making decisions regarding waterbody health for 305(b) reporting or 303(d) listing, they have historically relied on former language at Section 7.2.c.4 ("Where lesser quality is due to natural conditions...the naturally occurring values shall be the applicable criteria."). DEP has asked to be exempt from the expanded language when making decisions for 305(b) or 303(d) reporting.

It is the opinion of the Service that if the expanded language provides supportable scientific guidelines in determining natural conditions, the reason for establishing natural background conditions (i.e. establishing NPDES limits, 303(d) listing, 305(b) reporting) has no bearing on when or who uses the guidelines. The Service recommends that the guidelines be applicable for any situation that requires determination of a natural conditions.

Section 8.22.1

WVDEP has commented on a significant deficiency in the water quality standards. Some constituents are toxic to aquatic organisms at levels below the method detection limits and when that is the case, DEP can no longer assume those constituents are at zero levels. DEP has suggested re-adoption of language in the former 46 CSR 1-8.5 (effective date July 1998) "Implementation procedure for parameters with water quality criteria which are below the detection limit". The Service believes that this could be an appropriate method to provide protection from those parameters and recommend consideration of this approach or any other scientifically supportable methodology that would resolve this problem. There are parameters that are toxic to threatened and endangered species at levels below detection limits. We would be glad to provide any information and comments on any methodology that may be considered to resolve this problem.

Sections 8.7.1; 8.14; 8.22; 8.25

WVDEP has commented that in these sections Requirements Governing Water Quality Standards are not consistent with either ORSANCO or Health Department values or Ground Water Rules. It is the Service's opinion that for the purpose of the Triennial Review it is appropriate to review and, if necessary, revise Water Quality Standards based on peer reviewed scientific data and through supportable guidance provided specifically for Rule 46CSR Title 1. The rules and criteria provided in other programs or agencies may or may not be appropriate for

Water Quality Standards and consistency should not be a guiding principle. Information available from other programs, authorities, or new scientific studies should be considered, and as supporting information and made available for review during the Triennial Review process. However, consideration of that information should be made within the context of guidance provided for Rule 46CSR, Title 1.

Section 8.12

This section provides numeric criteria for dissolved oxygen (DO). DEP has requested clarification of the intent of the language "at any time" for these criteria. Presently, it is required that for aquatic life use B1 (warmwater), with the exception of the Kanawha and Ohio River mainstems, DO shall not be less than 5 mg/l at any time. For aquatic use B2 (trout waters) DO shall not be below 7 mg/l in spawning areas and in no case less than 6 mg/l at any time.

It is well established in fishery literature that the 5 mg/l, 6 mg/l, and 7 mg/l values for warmwater, trout, and spawning trout, respectively, are the minimal levels that will generally sustain those fisheries. However, it is common for daily excursions below those values to occur in lakes and larger order steams. Consumption of DO during nighttime decomposition of organic matter, temperature variations, and other processes, can reduce DO concentrations to below 5 mg/l., particularly at night when plants are unable to produce oxygen. Because of those processes, lakes and larger streams such as the Kanawha and Ohio Rivers will at times have values below 5 mg/l, and fish communities are adapted to that natural phenomena. However, most of the State's streams are small order, infertile waters with relatively small amounts of plants, organic matter, and with stable DO content. For those streams, excursions below the water quality standards at any time would not be acceptable and could change the stream use. This is especially true for trout waters. The Service recommends there should be no change in the DO numeric standards.

Section 8.32

DEP has asked the Board to review the turbidity standard and explain how the standard applies to chronic life criteria. The Service conducted a literature review of the effects of turbidity (Vohs et al. 1993) and provide the following information from that review:

> Suspended solids result in respiratory interference to gilled aquatic organisms and can cause death, particularly to immature fish. Increased suspended solids also cause stress to bivalves by decreasing their pumping rates. In one study, it was found that when suspended solids were four times the normal concentrations the population density of macroinvertebrates decreased and the drift rate of those organisms increased 90%. Reduction in population density of the macroinvertebrates occurred even in the absence of visible accumulation of sediment and the drift rate responded to suspended material in the absence of significant settling.
>
> The European Inland Fisheries Advisory Commission reported that a river in France that supports a cyprinid fish fauna, supported no fish in a stretch of that stream that contains

up to 570 ppm suspended solids from coal mines. A few chubs and roach were surviving 10 km below the mines, where suspended solids had fallen to about 100 ppm.

A study below a quarry showed that sucker (Catostomus sp.) and redhorse populations Moxostoma erythrurum) recovered when small amounts of solids were released from the quarry, but never reached the levels of those above the quarry even after two years when solids never exceeded 80 ppm. Carp (Cyprinus carpio) and longear sunfish (Lepomis megalotis) populations below the quarry never reached the same abundance as above the quarry. Spotted bass (Micropterus punctulatus) showed some resistance to quarry inputs of solids but showed a slower growth rate. It was concluded that lack of recovery two years after population decimation is evidence that a depressive effect is exerted on warmwater fish populations by suspended solid loads that include not more than 40 mg/l additional inorganic solids. Avoidance reactions were also observed in this study that were clearly due to suspended sediment in absence of significant deposition.

The open water community consists of a benthic community that live on and in the river bed and a pelagic community composed of organisms that live within the water column. The kinds of organisms that comprise the benthic community is dependent on physical parameters such as sediment

Based on this evidence, it the Service recommends that a turbidity criterion be retained. We also believe that additional literature reviews would further support the need for the criterion.

Turbidity is an indirect measure of suspended solids. At some point, depending on aspects of flow and channel morphology, suspended solids will be deposited as sediments to stream or lake beds. If suspended solids are regulated sedimentation will be reduced. The indirect effects of sedimentation are well documented in the literature and has the potential to significantly effect aquatic biota and can change the existing or designated use of a water body. Sedimentation is the largest stressor in the Mid-Atlantic Region with 25% of the stream miles in that region being impacted [Tom De Moss (USEPA) presentation at 2003 Mid-Atlantic Water Pollution Biology Workshop]. USEPA has begun to address this problem and has developed a Protocol for Developing Sediment Total Maximum Daily Loads (TMDL) (EPA 1999). A turbidity criterion aids in reducing sedimentation impacts and maintaining the existing and designated uses.

At Section 8.32.1, turbidity exemptions are granted (with the exception of trout waters) to activities at which Best Management Practices are being utilized, including surface mining activities. The Service has conducted many surface mining site visits where mining and/or timbering activities are being conducted. Based on our observations, we believe that there are significant turbidity and sedimentation stream impacts from those activities. We recommend that DEP evaluate turbidity and sedimentation effects from exempted activities and the Board review the validity of exempted activities, based on the results of the evaluation.

We appreciate the opportunity to provide our comments. If you have questions or require additional information, please contact Dan Ramsey of my staff, or contact me directly at (304)636-6586 or at the letterhead address.

Sincerely,

William A. Tolin

William A. Tolin
Acting Supervisor

Literature Cited

Brodeur. J. C., F. Okland. B. Finstad. D. G. Dixon and R. S. McKinley. 2001. Effects of subchronic exposure to aluminum in acidic waters on bioenergetics of atlantic salmon (*Salmo salar*). Ecotox Environ.Safety 49(3):226-234.

Briggs. S. A. 1992. Basic guide to pesticides. their characteristics and hazards. Taylor and Francis Pub.. Washington. DC.

Carpenter Environmental Associates. 1993. Comments of Affiliated Construction Trades on proposed Rule 46 CSR 1 . before the West Virginia Legislative Rule Making Review Committee. February 8-9. 1993.

Government of Canada. 1992. Canadian environmental protection act. Priority substances list assessment report no.4. toluene.

Government of Canada. 1993a. Canadian environmental protection act. Priority substances list assessment report, trichloroethylene.

Government of Canada. 1993b. Canadian environmental protection act. Priority substances list assessment report, tetrachloroethylene.

Government of Canada. 1993c. Canadian environmental protection act. Priority substances list assessment report. 1.1.2.2-tetrachloroethane..

Government of Canada. 1994.Canadian environmental protection act. Priority substances list assessment report. polycyclic aromatic hydrocarbons.

LaZerte. B. 1986. Metals and acidification. Wat., Air., .Soil Pollut. 3:569-576.

Poleo. A. B. S., E. Lydersen. B. O. Rosseland. F. Kroglund. B. Salbu. R. D. Vogt and A. Kvellestad. 1994. Increased mortality of fish due to changing Al-chemistry of mixing zones between limed streams and acidic tributaries. Wat. Air. and Soil Pollut. 75(3/4):339-351.

Sparling. D. W. and T. P. Lowe. 1996.Environmental hazards of aluminum to plants. fish. and wildlife. Rev. Eviron. Contam. Toxicol. 145:1-127.

USFWS. 1980. Handbook of acute toxicity of chemicals to fish and aquatic invertebrates. United States Department of Interior. Fish and Wildlife Service Publication 137.

USEPA. 1988. Ambient aquatic life water quality criteria for hexachlorobenzene. Draft Guidance Document. August 31. 1988. U. S. Environmental Protection Agency. Office of Research and Development. Duluth. MN.

USEPA.1990. The investigation of aluminates in the Choptank River. U. S. Environmental Protection Agency, Final Project Report.

USEPA. 1991. Technical support document for water quality-based toxics control. EPA/505/2-90-001.

USEPA. 1994. Water Quality Standards Handbook. Second Edition. USEPA-823-B-94-005a, August 1994.

USEPA. 1999. Protocol for developing sediment TMDLs. EPA 841-B-99-004, October, 1999.

USEPA, USFWS. 2001. Memorandum of agreement between the Environmental Protection Agency, Fish and Wildlife Service and National Marine Fisheries.Service regarding enhanced coordination under the Clean Water Act and Endangered Species Act. Federal Register 66(36):11202-11217.

Vuorinen, M., J. Vuorinen, J. Hoikka and S. Peuranen. 1993. Lethal and sublethal threshold values of aluminum and acidity to pike (*Esox lucius*), whitefish (*Coregonus lavaretus pallasi*), pike perch (*Stizostedion lucioperca*) and roach (*Rutilus rutilis*) yolk-sac fry. Pages 953-967 in The Science of the Total Environment. Elsevier Pub Co., Amsterdam.

Wren, C. D. and G. L. Stephenson. 1991. The effect of acidification on the accumulation and toxicity of metals to freshwater invertebrates. Environ. Pollu. 71:205-241.

Vohs, P. A., I. J. Moore and J. S. Ramsey. 1993. A critical review of the effects of turbidity on aquatic organisms in large rivers. Iowa Cooperative Fish and Wildlife Research Unit, Iowa State University, Ames, Iowa. Long term monitoring report Special report 93-S002.

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cc:
USEPA-Cheryl Atkinson
USFWS-Dave Densmore
WVEQB - Libby Chatfield
Reader File
Project File
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Filename: H:\01-DAN\Tri Rev MAR 03.wpd

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JUN 23 2003
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

Mr. Ed Snyder, Chair
Environmental Quality Board
1615 Washington St., East, Suite 301
Charleston, WV 25311-2126

June 23 2003

RE: TRIENNIAL REVIEW OF WATER QUALITY STANDARDS REVIEW: COMMENTS RELATED TO THE FECAL COLIFORM STANDARD

Dear Mr. Snyder,

As future Health Care Professionals and residents of Fayette and Raleigh Counties we would like to provide comments opposing the proposed changes to the fecal coliform standard for contact recreation.

We find two key glaring weaknesses in the EQB's proposal. Using a single sample for fecal coliform followed by an E.coli test is not possible because the water sample would be too old for accurate testing after the fecal coliform tests are performed. Secondly, elevated levels of bacteria from sewage overflows are episodic and therefore any tests for E. coli which follow a fecal coliform test with criteria violations may not reflect similar conditions. This leaves violations undetected, unreported and a potential risk to human health.

Fecal coliform is a critically important standard related to public health. A valid bacterial standard is important in protecting all of West Virginia's citizens who use and recreate in our waters. A single weekend epidemic of salmonella or campylobacter could have serious effects on the health of those citizens.

According to the Center for Disease Control (CDC), "the most frequent waterborne disease illness reported is gastroenteritis" yet more serious diseases can occur from exposure to bacterial infected waters. "Infection with cryptosporidium can occur after swallowing as few as 10-100 oocysts, swallowing a single mouthful of contaminated water could cause illness. The CDC reports that "during 1997-1998 four deaths were caused by primary amebic meningoencephalitis… The water could enter through a person's body through the nasal passages when water is forced up the nose." Although this is rare, this example illustrates the potentially serious effects of waterborne disease.

The Board must reconsider this provision and promulgate a rule that is protective of public health and scientifically sound.

Sincerely,

Regina Hoguman
Rachel Bailey
Beverly Jeffs MSTA, WVSOM
Nikki Morrison
Molly Englert
[illegible]
[illegible]
Lora Adkins

Century ALUMINUM
Ravenswood Operations

June 23, 2003

Dr. Edward M. Snyder, Chair
West Virginia Environmental Quality Board
1615 Washington Street, East
Charleston, West Virginia 25311

Re: 46 CSR § 1 – Water Quality Standards
Comments on Proposed Revisions

Dear Chairman Snyder:

Century Aluminum of West Virginia, Inc., (CAWV) offers the following comments on the proposed changes to 46 CSR 1 - Requirements Governing Water Quality Standards. Both the West Virginia Manufacturers Association and the West Virginia Chamber of Commerce have made extensive comments on the proposed revisions to the water quality standards, and CAWV incorporate those comments by reference. CAWV will comment only on those matters which are most important to it.

Method Detection Limit

While this issue may at first appear to be of little consequence, the lack of adequate method detection limits to measure compliance with water quality standards has resulted in increased permit responsibilities and added compliance costs for CAWV. In September 2002, DEP reissued CAWV's NPDES permit. The new NPDES permit contains several additional parameters which CAWV must monitor at least once per month based upon a reasonable potential analysis despite the fact that CAWV does not generate these pollutants at its facility.

These parameters were added to CAWV's permit because the method detection limit for these parameters was insufficient for purposes of measuring compliance with the water quality standards. These parameters must be analyzed by CAWV utilizing more sensitive analytical methods until CAWV can demonstrate that its

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A Century Aluminum Company

effluent does not have a reasonable potential to exceed the applicable numeric criteria.

The proposed rule will exacerbate this problem. A number of the proposed criteria cannot be measured at proposed level the by the available analytical techniques. For example, CAWV currently has technology-based effluent limits for benzo(a)pyrene. The available analytical method is not sufficiently sensitive to measure concentrations at or below the Board's proposed water quality criteria for benzo(a)pyrene. No practical method exists to determine whether an effluent causes a reasonable potential to exceed the criteria.

Insufficient Review

Based upon the triennial review, the Board has proposed extensive changes to the water quality standards. This triennial review was performed very quickly, with little review of many of the individual parameters. As indicated in the past with other parameters, including aluminum, EPA's proposed criteria are not flawless. Also, as we have seen with aluminum, once West Virginia adopts a criterion, it is very difficult if not impossible to revise or correct a faulty decision to adopt a criterion.

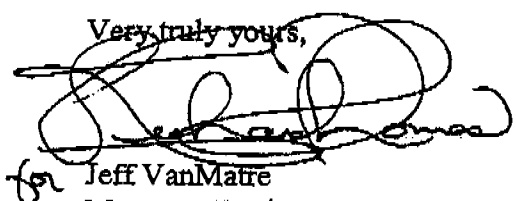
Accordingly, CAWV urges the Board to adopt only those proposed parameters which have substantial support and which have been reviewed individually. Simply adopting EPA's proposed parameters without allowing time for a meaningful review of the underlying criteria documents could result in devastating effects to the regulated community with potentially no environmental benefit.

CAWV certainly has not had the opportunity to determine which of the proposed revisions may substantially affect its facility or to examine the scientific basis or validity of the proposed parameters. CAWV has expended substantial resources in the past attempting to resolve the faulty aluminum criteria. CAWV asks that the Board allow more time for facilities to review the individual proposed criteria and determine whether they are scientifically defensible or appropriate for West Virginia.

Conclusion

CAWV looks forward to working with the Board as it reassesses these issues in the future. Thank you for the opportunity to provide these comments. Should you have any questions, please do not hesitate to contact me.

Very truly yours,



for Jeff VanMatre
Manager, Environmental Affairs

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JUN 23 2003
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

Comments of the

WEST VIRGINIA MANUFACTURERS ASSOCIATION

and the

West Virginia Oil & Natural Gas Association

regarding the

TRIENNIAL REVIEW OF WATER QUALITY STANDARDS

46 C.S.R. 1

I. Introduction

The West Virginia Manufacturers Association ("WVMA") is an organization of over 200 businesses devoted to the advancement of industrial manufacturing activities and related businesses in West Virginia. The West Virginia Oil and Natural Gas Association ("WVONGA") is the oldest oil and gas trade association in West Virginia, representing both oil and gas producers and gas transmission operations. The WVMA and WVONGA ("Commenters") frequently offer comments on rules and regulations that are of interest to their members. The 2003 triennial review of water quality standards by the Environmental Quality Board ("Board") will have a significant effect on its members. Accordingly, the Commenters submit the following comments.

II. General Comments

A. Costs and Considerations of Proposed Rule

When conducting the federally-mandated triennial review of West Virginia's water quality standards, the Board must include a fiscal note pursuant to *W. Va. Code* §29A-3-4. In addition, the Board must take into account the "expansion of employment opportunities, maintenance and expansion of agriculture and the provision of a permanent foundation for healthy industrial development" in the development of water quality standards under *W. Va. Code* §§22-11-2 and 22B-3-4(b).

In the fiscal note, the Board stated that the proposed rule would not impose any costs and that there would be no economic impact on state government, political subdivisions, specific industries, groups, or the public at large. Clearly, the Board failed to properly analyze the impact of the proposed rule on the regulated community and the public. There is no explanation of why the addition of over 90 regulated substances for which criteria are being set, and the addition of hundreds

of streams to the list of trout waters, would have no economic effect on the industrial community and the citizens of West Virginia. Furthermore, a detailed explanation of the effects of the proposed rule is required. In the fiscal note, the Board claims there will be no effects from the proposed rule and then fails to offer any explanation for this conclusion.

In setting standards, the Board must take into account the effect of its rules on the economic development and industrial growth of the state. Unless the Board provides its best estimate of the fiscal impact of its proposals, the public is unable to comment intelligently on the Board's proposals. The Commenters urge the Board to reconsider the fiscal impact of the proposed rules on the regulated industrial community, as mandated by *W. Va. Code* §§29A-3-4, 22-11-2 and 22B-3-4(b). Unless it does so, the Board will be in violation of West Virginia law.

III. Specific Comments

A. Category A, Public Water Supply

The Board has proposed deleting Appendix B, which identified known public water supplies. The Commenters are concerned that the elimination of this list is further evidence of the Board's desire to designate the Category A use on a state-wide basis without going through the formal rule-making process. (The Board's use removal procedural rule, 46 C.S.R. 7, passed last year but rejected by the leadership of the Legislative Rule-Making Review Committee, is another example of this.) The current Appendix B, while not an exclusive list of public water supplies, proves by its very existence that some waters are public water supplies and some are not. There would have been no reason to develop Appendix B if the Board had always believed that all state streams are designated as Category A, public water supply. Moreover, the Department of Health has, in the past several years, updated the list of those facilities that serve as public water intakes. We have included a copy of that list for the Board's use.

If the Board intends to apply the Category A use on a statewide basis, it must propose an amendment to the water quality standards that would accomplish that goal, just as the Board has proposed doing on two prior occasions. The Commenters are opposed to designating all state waters as Category A, as the designation is unwarranted and inappropriate in many locations. However, the Commenters do support designating as public water supplies those areas of water bodies where, after conventional treatment, the water is withdrawn for use by a public drinking water system. It

would be reasonable to apply Category A criteria at the point of intake, and to require a discharger to confirm that its effluent would not cause a violation of water quality standards at the next public water supply intake downstream, or to confirm there is no public water supply within 5 miles downstream. That effectively puts the burden on the discharger to show that its effluent would not cause a violation of the water quality standards, and would not impose the cost of meeting water quality standards on the public water supply.

The current position of the Department of Environmental Protection ("DEP") notwithstanding, it is evident from past practice that the DEP has not consistently considered all state waters as public water supplies, and the Category A use has never been formally assigned to all state waters through rulemaking by the Board. Therefore, the Commenters propose that the Board clarify the current state of the law by developing a definition of Category A that protects known public water supplies, including a reasonable protective zone up to one-half mile upstream. The rest of the state's stream segments would not have the Category A designation. Accordingly, Section 6.2 should be revised to clarify that Category A does not apply except in those areas where the actual use is occurring. The language of Section 6.2 should be deleted and the following should replace it:

> 6.2 Category A - Water Supply, Public - This category is used to describe surface waters which, after conventional treatment, are regularly used for public consumption. Compliance with the Category A criteria in Appendix E, Table 1, will be determined at the surface water intake, except that the Director may, at his or her discretion, extend the Category A area up to ½ mile upstream of a public water supply's surface water intake.

In addition, Section 5.2.c, which prohibits exceedances of the human health criteria unless a mixing zone has been established, should be changed so that the first sentence of the section begins, "In all areas designated as Category A, . . ." Section 7.2.a.2 could be eliminated if the definition of Category A were changed as we have proposed, as the Director would have the authority to extend the Category A zone upstream of an intake where he or she deemed that extension necessary to protect the public water supply. Section 5.2.h.6 could be eliminated as well.

B. New Appendix E Criteria

The Board has proposed numeric criteria for all priority toxic pollutants for which the U.S. Environmental Protection Agency ("EPA") has established guidance. It appears that the Board's proposal is based upon a mistaken belief that it was required to have criteria for all of these pollutants in its standards. This is not the case. In the National Toxics Rule (57 Fed. Reg. 60848) (December 22, 1992) ("NTR") EPA clearly states that a State can meet the requirements of the federal Clean Water Act ("CWA") with respect to adopting toxic pollutant criteria by following one of three options. Option 1 allows a State to adopt numeric criteria for all toxic pollutants which EPA has developed criteria guidance, "regardless of whether the pollutants are known to be present" in State waters. This appears to be the option chosen by the Board. Option 2 allows a state to adopt numeric criteria for toxic pollutants "where the state determines based on available information that the pollutants are present or discharged and can reasonably be expected to interfere with designated uses." 57 Fed. Reg. 60853. If a state chooses to use this option EPA recommends that the State use data gathered during the CWA Section 304(1) water quality assessments as a starting point to identify those water segments that need water quality standards for priority toxic pollutants. Id.

Option 3 provided by EPA allows the State to adopt a procedure which would be applied to a narrative water quality standard which prohibits toxics in receiving waters. This procedure would be used to calculate state-specific derived numeric criteria. These criteria, at a minimum, would have to be developed for all toxic pollutants which are "discharged or present in the affected waters and could reasonably be expected to interfere with its designated uses." This approach clearly gives a State the greatest flexibility in assigning water criteria which appropriately recognize the nature of designated uses and types of indigenous aquatic life in state water bodies.

In the proposed rule the Board has chosen the most rigid of all these options that have been made available by EPA. We urge the Board to reconsider its action and adopt new criteria only for those toxic pollutants which are known to be discharged or present in state waters and could recently be expected to interfere with its designated uses.

There are significant negative aspects of following the approach adopted by the Board:

a. Where the Board has adopted criteria for toxic pollutants that are not discharged or present in state waters, significant costs may result to the regulated community from sampling and analyses that will be necessary to prove that such substances are not present.

b. Because of the extremely low concentrations establishing in the criteria for certain toxic pollutants, it is inevitable that any laboratory analysis will result in false positives on some occasions, which will place an additional burden on the regulated community to prove the absence of the substance. Such proof may not be possible at such low levels.

c. The national criteria are adopted based on toxicity tests run on a variety of species, many of which would not be indigenous to West Virginia waters. As a result wholesale adoption of national criteria would generally result in criteria that are more stringent than necessary to protect designated uses in West Virginia.

We recommend that the Board consider a phased approach to the adoption of additional criteria for toxic pollutants. The first phase would be to identify those pollutants that are believed to be "discharged or present in state waters and which could reasonably be expected to interfere with designated uses." Once it has been determined that a criterion needs to be adopted on the basis of the results of Phase 1, in Phase 2 the Board would evaluate the national criteria issued by EPA to determine its applicability for West Virginia waters. On the basis of this investigation, in Phase 3 the Board would either adopt the national criteria or calculate a derived numeric criteria using procedures that satisfy all the regulatory and scientific requirements specified in the EPA guidance. We believe this 3-phase approach is a much prudent means of evaluating and adding criteria where appropriate, to West Virginia's water quality standards.

Many organizations have offered specific comments on changes and additions to the Appendix E criteria, and we urge the Board to give them careful consideration. In particular, the WVMA participated in the review of revised criteria reported by Acacia Environmental, and adopts that review herein.

C. Trout Waters

The Board has proposed adding hundreds of streams to Appendix A, List of Category B-2 Trout Waters, without providing any information as to whether each of the additional streams meets the Section 2.20 definition of trout waters. 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." 46 C.S.R. 1-2.20. We understand that the new streams were added because they were on one of two lists prepared by the Division of Natural Resources (DNR): naturally-reproducing trout streams, and streams stocked with trout fingerlings that had an annual carry-over. The basis for the DNR's determination not being part of the record, we do not believe the Board can accept the DNR's representations that any or all of the streams on those lists are trout streams. Before taking any action, the Board should have first verified that all the trout water streams on the list, those currently there and those proposed for addition, meet the requirements of Section 2.20.

If there is a lack of information, or difference of opinion as to whether a stream should be on the Appendix A trout stream list, the Board should leave it off. It is the definition in Section 2.20 that controls, and any stream that meets the definition is a trout stream regardless of whether or not it is listed. Leaving a stream off the list would not change its status, but putting a stream that does not meet the Category B-2 description on the list might be interpreted as a conclusion that the water body is a trout stream, even if it would not otherwise qualify as such. Such an improper listing has important ramifications, as a use attainability analysis must be done to remove a designated use, something that is very difficult to accomplish.[1] The Board should err on the side of leaving a stream off Appendix A if there is any doubt as to whether it qualifies as Category B-2, to avoid posing unnecessary hardships on those who work and live beside the mistakenly-listed stream.

The Board should consider revising its definition of what constitutes a trout stream, to assign that distinction only to streams that are naturally reproducing. The Board might develop other subcategories that recognize the difference between water quality needed for reproducing trout, found in the current B-2 subcategorization, and the water quality needed for stocked streams. The Board's Appendix A should be reserved for true, naturally-reproducing trout streams. This would

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[1]Even if the DNR was correct in identifying certain stocked streams as meeting the EQB definition of a trout stream, it points out a problem for streams that are currently stocked, but not stocked in the future. In that case, meeting the definition of a trout stream would not depend on water quality, but on the administrative decisions of the DNR as to whether to stock or not stock streams. Natural reproduction is a more rational criterion for determining whether a stream is B-2 than whether it has carry-over stocked populations.

help eliminate the confusion that might occur as some mistakenly conclude that all the streams on the proposed Appendix A are naturally-reproducing, and therefore should be waters of special concern. *See* Section 4.1.c. We would particularly oppose any implication that all streams on Appendix A are, or should be, Tier 2.5 waters.

Mistakenly including streams on Appendix A results in over-regulation and may cause problems in the future for those who live beside the streams. The different standards that apply to Category B-2 waters and Category B-1 waters can be significant, and it is incumbent on the Board to confirm that the stream qualifies as B-2 before listing it on Appendix A. Therefore, the additional streams should be removed from the Appendix A trout water list until the Board finds that each stream meets the definition of trout water to justify its inclusion.

D. Narrative Criteria

The Board proposes allowing use of EPA's "organoleptic effect criteria . . . when applicable" to determine compliance with the narrative prohibition against conditions causing adverse taste or odor effects. *See* Section 3.2.d. There is no explanation as to what those criteria are, or where they may be found. Our investigation has revealed that there are specific numeric criteria that EPA has developed, but has not required states to adopt. In many cases, the organoleptic criteria are much lower than the aquatic life protection or human health criteria that are found in Appendix E.

The Board should not try to incorporate numeric criteria by a reference in the narrative criteria. Numeric criteria should be listed separately in Appendix E, where they can be compared with the other numeric criteria. If the Board is concerned about compliance with narrative standards (and we are not aware of any evidence that this has been a problem) it should review the EPA's criteria individually, and propose those that are defensible.

In addition, we are concerned that the organoleptic effect criteria are applicable when there are tastes or odors that would affect the designated uses of the affected waters. In many cases, the only use in which taste or odor would be an issue would be the Category A drinking water use, which does not apply in every location. The Board needs to carefully consider which of the organoleptic criteria apply to which uses before adopting them.

E. Criteria for Carcinogens

The Board has decided not to propose adoption of the harmonic mean flow as the design flow for setting NPDES permit limits for carcinogens. Until such time as the Board or Legislature decides to do so, we urge the Board to rewrite Section 8.2.b. As currently written, the statement that "the regulatory requirements for determining effluent limits for carcinogens shall remain as they were on the date the rule was proposed" provides no guidance to anyone who does not know that the Board is referring to the 7Q10. The Board should strive to make its rule as clear as possible, and the present language is too vague to be acceptable.

The Board must also recognize that the criteria for carcinogens in Appendix E is unlawful as presently stated. The Appendix E numbers for carcinogens were developed assuming average exposures over many years. The Board has applied them on a continual worst-case basis by insisting that permit limits be set using the 7Q10. By doing so, the Board has effectively violated the mandate of Section 8.2.a, which states that the criteria for carcinogens is "based upon an estimated risk level of one additional cancer case per one million persons (10-6). . . ." As applied in NPDES permits, the criteria for carcinogens is set at levels that greatly exceed the one in a million additional risk factor.[2] The Board should amend Appendix E to provide that application of the criteria for carcinogens in NPDES permits should not exceed the Board's stated risk level of one in a million.

F. Safe Concentration Levels

Where water quality standards for a substance have not been set, Section 9 provides a means of establishing a safe concentration value for protection of aquatic life. In determining that safe concentration level, different application factors (multipliers) are used, depending on whether the pollutant is persistent or cumulative. The terms "persistent" and "cumulative" are defined, but without much precision.

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[2]According to the *Technical Support Document for Water Quality-based Toxics Control*, EPA/505/2-90-001 (March, 1991)(TSD), EPA picked 60 streams at random, and found that in all of them the harmonic mean flow was at least 2 times the 7Q10, in most of the streams was at least 2.5 times the 7Q10, and in 2/3 of the streams the harmonic mean flow was 3.5 times the 7Q10, or greater. *See* TSD at page 88. In light of this information, the criteria for carcinogens in the Board's rules are at least twice what they should be to meet the 10-6 risk level for carcinogens.

We believe the Board did not intend that substances that are only minimally persistent or cumulative should be subject to the lower multiplier. A substance that bioaccumulates only marginally (e.g., ten or a hundred times the ambient water quality) should not be considered a bioaccumulative, and subject to the lower multiplier. After considering this issue carefully, the Commenters urge the Board to study this issue further, and propose a clearer, more defensible definition of bioaccumulative. We think that the bioaccumulation factor should not be less than 1000, but believe that should be determined after a consideration of the factors unique to West Virginia. We do not believe the Board should adopt the Great Lakes Initiative (GLI) definition of bioaccumulation at this time, as that definition is intimately related to other aspects of the GLI program, and without adoption of the entire program, the definitions would be incomplete. However, we think the GLI would provide helpful information as the Board refines its definitions of cumulative and persistent.

CONCLUSION

The WVMA and WVONGA appreciate this opportunity to comment on West Virginia's water quality standards, and hope their comments will be given careful consideration by the Board.

West Virginia Manufacturers Association

West Virginia Oil and Natural Gas Association

AQBEQB CLERK - Proposed fecal coliform/E. coli rule

From: "Cacapon Institute" <pcrel@access.mountain.net>
To: "Libby Chatfield" <lchatfield@aqbeqb.state.wv.us>
Date: 6/16/2003 3:47 PM
Subject: Proposed fecal coliform/E. coli rule
CC: "Neil & Jan Gillies" <gillies@hardynet.com>

Good afternoon Libby.

I read the proposed revision to the fecal coliform bacteria standard with interest. I suspect that the impetus for this change is the USEPA push to change the standard from fecal coliforms to E. coli. I certainly understand that the literature indicates E. coli contamination has a more consistent correlation with gastrointestinal disease than the fecal group generally (where the limited studies have found no correlation). However, I don't understand how the proposed standard could be applied with out breaking the rather important rule on sample holding time. If the E. coli test is to be run on a sample after the same sample tests as non-compliant for fecal coliforms, then the minimum holding time for that sample will have been 24 hours, possibly as much as 32 hours (6 hours sample+ delivery to lab, plus 2 hours for lab to run sample, plus 24 hours incubation period). Assuming the science behind the required holding time is sound, then a 32 hour holding time would be unacceptable.

If the intent is to collect a new sample after a fecal coliform test is non-compliant - which is not how the proposed rule reads - then you have the problem of collecting the E. coli check sample under conditions that will certainly be different than the conditions occuring at the time the first sample was collected. Since bacterial contamination tends to be episodic, this would also be inappropriate.

Finally, I'm not personally willing to give up on fecal coliform bacteria as a reasonable indicator for fecal matter in the water, and thus a significant elevated potential for the presence of pathogenic organisms. Call me old-fashioned, but it still makes sense to me.

Regards,

W. Neil Gillies
Executive Director
Cacapon Institute
Rt 1 Box 326
High View, WV 26808
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www.cacaponinstitute.org

Those who can make you believe absurdities can make you commit atrocities. Voltaire (1694-1778)

TABLE 1
ALTERNATE STORM LIMITATIONS

EFFLUENT TYPES	DRY WEATHER	DCP*	1 YEAR - 24 HOUR	2 YEAR - 24 HOUR	10 YEAR - 24 HOUR
ACID OR FERRUGINOUS CATEGORIES					
a. Discharges from underground workings of underground mines not commingled	TSS pH Iron Manganese Flow		(NO ALTERNATE LIMITATIONS)		
b. Discharges from underground workings of underground mines commingled	TSS pH Iron Manganese Flow				Flow pH
c. Controlled surface mine drainage(except steep slope and mountaintop removal)	TSS pH Iron Manganese Flow				Flow pH
d. Non-controlled surface mine drainage(except steep slope and mountaintop removal)	TSS Iron Flow pH Manganese	SS** pH Iron Manganese Flow		SS** pH Flow	Flow pH
e. Discharges from coal refuse disposal areas	TSS pH Iron Manganese Flow		Flow SS** pH		Flow pH
f. Discharges from steep slope and mountaintop removal areas)	TSS Iron Flow pH Manganese		Flow SS** pH		Flow pH
g. Discharges from preparation plants and preparation plant associated areas (excluding coal refuse piles)	TSS Iron Flow pH Manganese		Flow SS** pH		Flow pH
h. Discharges from reclamation areas	Flow SS** pH				Flow pH
ALKALINE CATEGORY					
i. Discharges from underground workings of underground mines not commingled	TSS ph Iron Flow		(NO ALTERNATE LIMITATIONS)		
j. Alkaline Mine Discharges	TSS Iron Flow pH Manganese		Flow SS** pH		Flow pH
k. Reclamation areas	Flow SS** pH				Flow pH
WATER QUALITY BASED LIMITS					
l. Water quality based effluent limits	TSS Iron Flow pH Mn***		SS** pH Iron Flow Manganese***		
m. Bathhouse & Sewage	UBOD BOD5 TKN DO		(NO ALTERNATE LIMITATIONS)		

DCP* -- Discharge or increase in the volume of a discharge caused by precipitation within any 24 hour period
SS** -- Settleable Solids

Mn*** -- If Manganese limits are applicable

County: Wayne 1-Year 02.42 2-Year 02.74 10-Year 03.95

Bryan K. Moore, Chair
West Virginia Council of Trout Unlimited
787 Twin Oaks Dr.
Bridgeport, WV 26330-1645

Dr. Ed Snyder, Chair
Environmental Quality Board
1615 Washington St., East
Suite 301
Charleston, WV 25311-2126

June 17, 2003

Dear Dr. Snyder,

The West Virginia Council of Trout Unlimited (WVCTU) strongly supports the work and effort the Environmental Quality Board (EQB) performs to formulate and promulgate the state's Water Quality Standards (WQS) to protect the integrity of the waters of West Virginia. The protection of the quality of coldwater streams is the mission of WVCTU and we have followed the development of the triennial review with direct interest. This letter is to provide comments on behalf of WVCTU in regard to the proposed legislative rule, Requirements Governing Water Quality Standards.

Trout Streams

WVCTU fully endorses and supports the updated list of Category B-2, Trout Waters. We believe that this is the most complete, comprehensive and scientifically supportable list of trout waters that has been compiled to date. We appreciate the efforts of the EQB, the Department of Environmental Protection, and the Division of Natural Resources (DNR) in facilitating the compilation of the trout stream list. We particularly recognize the diligent efforts of Mike Shingleton, DNR Coldwater Fisheries, in compiling a list based on factual data and scientific support.

It is imperative that these trout waters are recognized and protected as an irreplaceable resource and an important part of our state's heritage. WVCTU recommends that this list be considered as a working document, which can be added to as new information becomes available on other waters. We strongly encourage the retention of the Trout Waters List as it has been presented.

WVCTU is very concerned regarding the proposal to broaden the application of natural condition exceptions to trout streams. Trout streams are very sensitive systems that can be dramatically impacted by what may be perceived to be an insignificant alteration to water

quality. It is the opinion of WVCTU that a natural condition could prove to be subjective and almost impossible to identify due to anthropogenic impairments, particularly atmospheric deposition, that already exist in the vast majority of our trout streams. Atmospheric deposition presently impairs water quality and negatively impacts aquatic life in trout streams for parameters such as pH, dissolved oxygen, temperature, dissolved aluminum, dissolved iron and methyl mercury. The single impact of atmospheric deposition, without even considering other impacts, would make it extremely difficult to identify what natural background truly is in a West Virginia trout stream. Therefore, WVCTU strongly recommends that all trout waters in West Virginia be exempted from the consideration of natural background exceptions.

Turbidity

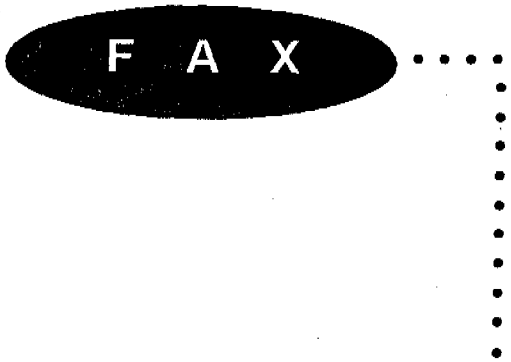
WVCTU strongly opposes the proposal to exempt from turbidity standards non-point sources exercising Best Management Practices and sites with surface mining permits. Sedimentation has been recognized as the single greatest impairment to waters nationwide. We believe it would be inappropriate to completely exempt the most significant potential sources of sedimentation from turbidity standards. Excessive turbidity, and the resulting sedimentation of stream bottoms, is a broad reaching problem which has been clearly shown to impair aquatic life, influence municipal and other drinking water supplies, and alter streambed elevation and hydrological function resulting in more frequent, devastating flood events. Our position is that if Best Management Practices and surface mine permits are installed and managed correctly there will not be a turbidity problem, and no need for an exemption.

Thank you for your time and consideration to the comments of WVCTU on this important issue. We appreciate the opportunity to submit these comments.

Sincerely,

Bryan K. Moore

Bryan K. Moore, Chair
WVCTU



WV Council of Trout Unlimited
787 Twin Oaks Dr.
Bridgeport, WV 26330

To:	Dr. Snyder - Environmental Quality Board
Fax number:	*70,1-304-558-4116
From:	Bryan K. Moore
Fax number:	
Business phone:	(304) 641-7714
Home phone:	
Date & Time:	6/19/2003 12:19:53 PM
Pages:	3
Re:	

SPILMAN THOMAS & BATTLE, PLLC

ATTORNEYS AT LAW

M. Ann Bradley
(304) 340-3882
abradley@spilmanlaw.com

June 23, 2003



Mr. Edward M. Snyder, Ph.D., Chair
Environmental Quality Board
1615 Washington Street, East, Suite 301
Charleston, West Virginia 25311-2126

Re: Proposed Revisions to the Water Quality Standards (46 CSR 1)

Dear Dr. Snyder:

The enclosed comments are provided on behalf of the Independent Oil and Gas Association of West Virginia in response to the public notice filed with the Secretary of State on May 19, 2003, announcing proposed revisions to West Virginia's water quality standards (46 CSR 1)

Thank you for the opportunity to comment on these proposed revisions. Should you have any questions or comments, please feel free to contact me.

Sincerely,

M. Ann Bradley | by LFN

M. Ann Bradley

LFN
Enclosure

RECEIVED
JUN 23 2003
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

COMMENTS OF INDEPENDENT OIL AND GAS ASSOCIATION OF WEST VIRGINIA ON PROPOSED REVISIONS TO WATER QUALITY STANDARDS – 46 CSR 1
June 23, 2003

These comments are provided on behalf of the Independent Oil and Gas Association of West Virginia ("IOGA"). IOGA is a statewide non-profit trade association representing companies engaged in the extraction of natural gas and oil in West Virginia, and the companies and individuals which support extraction activities. IOGA was formed to promote a strong, competitive and capable independent natural gas and oil producing industry in West Virginia. A part of IOGA's mission statement is to protect and improve both the business and natural environment of our state. To that end, IOGA has worked closely with the West Virginia Department of Environmental Protection and the WVDEP's Office of Oil and Gas to ensure the application of reasonable and effective environmental regulatory requirements to the oil and gas industry.

With these comments IOGA responds to a public notice filed with the Secretary of State on May 19, 2003, in which the Environmental Quality Board announced significant proposed revisions to the State water quality standards, 46 CSR 1 ("Proposed Rule").

GENERAL COMMENTS

1. Wholesale Adoption of All EPA Criteria for Toxic Pollutants – IOGA is concerned that the Board is rushing forward unnecessarily in proposing changes to so many criteria at the same time. As we understand EPA policy, the Board is only required to propose standards for those pollutants where available information indicates that the pollutants are

present or **discharged** in state waters AND that these pollutants can reasonably be expected to interfere with designated uses. IOGA supports the use of a three-step approach to the evaluation of new criteria. **First**, the Board should determine whether, on the basis of available information, such pollutants are present or being discharged in state waters. **Second**, if the finding to the first step is affirmative, the Board should then determine whether these pollutants are present in concentrations that can reasonably be expected to interfere with designated uses. **Third**, if the second step yields an affirmative finding, then the Board should determine whether the national criteria should be applied or whether some derived numeric criteria consistent with Clean Water Act ("CWA") requirements would be appropriate for the protection of state water uses. We believe that EPA guidance supports a more deliberate approach on the adoption of water quality criteria (see "National Toxics Rule" at 57 Fed. Reg. 60848) and we support the comments of the West Virginia Manufacturers' Association on this issue.

Just as Governor Wise and Secretary Timmermeyer have urged the Board to act deliberately and with caution on the adoption of harmonic mean design flow, and the Board embraced this approach, we urge the Board to show the same caution and act with deliberation in determining when and whether new criteria are necessary for the protection of West Virginia's waters. We believe the impact to the regulated community from blind adherence to EPA's national criteria will be enormous.

SPECIFIC COMMENTS

1. Arsenic – With regard to aquatic life uses, the Board has proposed to adopt EPA's nationwide criteria for arsenic. The Board would apply these criteria on the basis of total arsenic concentrations. However, the footnote to EPA's "National Recommended Water Quality Criteria:

2002," EPA–822-R-02-047, November 2002 ("EPA 2002 Criteria") states that the criterion was derived from data based on trivalent arsenic only. See EPA 2002 Criteria, footnote A, pages 21-22. This point is made to emphasize the conservative the nature of the proposed criteria for the protection of aquatic life. The Board's proposal also creates the inconsistent result that the Board's criteria for trivalent arsenic is higher than the proposed criteria for total arsenic. This makes no sense in view of the fact that trivalent arsenic is deemed to be the more toxic species of this parameter.

With regard to the human health criteria, the Board proposes adopting the Maximum Concentration Limit ("MCL") for arsenic of 10 ug/l established under the Safe Drinking Water Act ("SDWA"). See 40 CFR 141.62. However, the MCL which the Board relies upon does not become effective until **January 23, 2006**. See 40 CFR §141.11(b). Thus, not only is the Board adopting a number that, under the SDWA, would only be applied at end of tap (after various levels of treatment at the water plant) and applying it directly to state waters, but the Proposed Rule would also apply this drinking water limit to West Virginia waters **BEFORE** it is applied to actual drinking water sources under the SDWA. Presumably, EPA adopted a 4-year compliance period for the new arsenic standard under the SDWA because this additional time was deemed necessary to allow public water systems to achieve the new limitations.

We believe it is premature for the Board to act at this time to reduce the arsenic criteria for Categories A and C in the state water quality standards.

2. Turbidity - IOGA supports the proposed change to Section 8.32.1 of Appendix E, the Turbidity criteria, as it updates the reference to the state plan for discharges from non-point sources. The "Non-Point Source Management Plan" was issued by WVDEP in December 2000, and addresses management plans for non-point sources developed by various state agencies,

including the Office of Oil and Gas within WVDEP. With oversight from the Office of Oil and Gas, best management practices ("BMPs") are imposed through site reclamation plans that must be approved in order to obtain well drilling or re-work permits. Guidance on the appropriate BMPs to be used on oil and gas operations is contained in the West Virginia Erosion and Sediment Control Field Manual issued by the Office of Oil and Gas. The control of surface run-off from oil and gas activities has been addressed effectively and efficiently through the use of BMPs. For these reasons we believe the recognition of the use of such practices under the Turbidity Criterion is entirely appropriate and should be continued in the water quality standards.

3. Benzene – The proposed criteria for benzene of 2.2 ug/l (Category A) and 51 ug/l (Category C) should be changed to 22 ug/l and 510 ug/l, respectively. As the footnote to the EPA 2002 Criteria states, the numbers in the Proposed Rule are established to not exceed an increased cancer risk of 1×10^{-6}. See EPA 2002 Criteria, page 13, footnote C, page 20. As the Board is well aware, the use of the 7Q10 flow for establishing water quality-based permit limits adds an additional level of protection for this criteria. Therefore, the adoption of the EPA criteria results in a reduced risk that is even more protective than the 10^{-6} risk level. In addition, not only is the Board's proposal more restrictive than recommended in EPA guidance, it is also contrary to the Board's water quality standards which establish a target limitation on risk level increases at $1x10^{-6}$. See Section 8.2.a, 46 CSR 1. The footnotes to EPA's 2002 Criteria indicate that the appropriate adjustment to balance this risk and be consistent with the Board's rules would be to establish these criteria as 22 ug/l and 510 ug/l, respectively, for Category A and Category C. See EPA 2002 Criteria, footnote C, page 20.

4. Lead – The Proposed Rule deletes the Category A criteria for lead of 50 ug/l and replaces it with a criterion of 15 ug/l for Category A and Category C uses. There is no support for

this proposed change. Although EPA guidance does suggest the use of MCLs established under the SDWA in certain circumstances, the number proposed by the Board is not an MCL. The proposed criterion of 15 ug/l is identified as an "action level" under the federal SDWA regulations. The regulations provide that if more than 10% of tap water samples exceed the "action level," then the water system must implement certain additional source water treatment over an extended period of time. See 40 CFR §141.80(e) and 40 CFR §141.83.

The effect of the Proposed Rule would be to impose this action level as an end-of-pipe discharge limit on any facility that is discharging to a small stream. Such a requirement is clearly more stringent than the federal provision. Industrial and other dischargers would be required to meet limits that are more restrictive than those that are placed on public water systems.

As an additional point, we are not aware that EPA Region 3 has raised any objection to the existing water quality criteria for lead and, in fact, would have no legal basis for raising such an objection. For all these reasons we urge the Board to reject the proposed change and retain the current criterion for Category A of 50 ug/l.

5. Mercury – The Board has proposed to eliminate the acute criterion for "total Mercury in any unfiltered water sample" for aquatic life. The Board has not proposed any change however in this criteria as it would apply to Category A or Category C. See Section 8.1, 46 CSR 1. Consistent with action the Board has taken with regard to other parameters, the Board should have proposed to change the Mercury criterion to 2 ug/l, the current MCL for "inorganic mercury" as established under the federal SDWA. See 40 CFR 141.62(b). Because there is not currently a human health criteria established by EPA under the CWA, to adopt the MCL as established under the SDWA would be consistent with EPA guidance, and other guidance that has been heretofore provided to the Board.

6. Expansion of List of Trout Waters – The Proposed Rule would significantly expand the list of trout waters which currently appears in Appendix A of the water quality standards. The effect of listing a stream as a trout water is that more restrictive water quality criteria will be applied and any discharges to these waters will be severely restricted. The Board's proposal to add hundreds of new streams to the "trout waters" category in this single rule-making with a public review period of only thirty days does not allow any opportunity for concerned members of the public to have meaningful comment on this proposal. We urge the Board to adopt a more deliberate approach to this issue. In particular, we recommend that the Board consider providing notice of its proposed actions in the area where the potential trout waters are located to assure that members of the public have a meaningful opportunity to address this proposal.

7. Chlorides – The Board proposes to change the units by which the chloride criteria are represented. IOGA objects to the Category A and Category C criteria because they are not reflective of criteria developed by EPA under the CWA. Rather, these criteria are based on the secondary drinking water regulations adopted by EPA under the SDWA. The secondary standards are intended only to address cosmetic or aesthetic effects and are not necessary for the protection of human health. In addition, we note that the chronic water quality criteria for the protection of aquatic life that would be applicable to all waters of the State, is lower than the secondary drinking water regulation. Therefore, we believe it is not necessary to include the criteria for chloride for Categories A and C and we urge their deletion. Utilizing secondary standards in state water quality standards that are not necessary for the protection of human health imposes a standard on West Virginia dischargers that is not required of public water systems under the SDWA. We believe this is an irrational result and therefore urge the deletion of these criteria from the water quality standards.

CONCLUSION

The Environmental Quality Board has proposed many significant changes to the State water quality standards in this rule making. IOGA believes that many of these changes are premature or unnecessary for the protection of West Virginia waters. We trust that the Board will carefully consider its action with respect to the Proposed Rule in light of these comments.

Thank you for the opportunity to provide these comments to the Environmental Quality Board.

INDEPENDENT OIL AND GAS ASSOCIATION

OF WEST VIRGINIA

#260963

2. Amend the table in § 9.1 by removing the entry for 141.23–141.24 and adding new entries for 141.23(a)–(b), 141.23 (c), and 141.23(d)–141.24 to read as follows:

§ 9.1 OMB approvals under the Paperwork Reduction Act.

* * * * *

40 CFR citation	OMB control No.
* * * * *	
National Primary Drinking Water Regulations	
* * * * *	
141.23A(a)–(b)	2040–0090
141.23(c)	2040–0231
141.23(d)–141.24	2040–0090
* * * * *	

PART 141—NATIONAL PRIMARY DRINKING WATER REGULATIONS

1. The authority citation for part 141 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–4, 300j–9, and 300j–11.

Subpart A—[Amended]

§ 141.2 [Amended]

2. In 40 CFR 141.2 revise the definition heading for "*Point-of-entry treatment device*" to read "*Point-of-entry treatment device (POE)*", and revise the definition heading for "*Point-of-use treatment device*" to read "*Point-of-use treatment device (POU)*".

3. Amend § 141.6 by revising paragraphs (a) and (c), and adding paragraphs (j) and (k) to read as follows:

§ 141.6 Effective dates.

(a) Except as provided in paragraphs (b) through (k) of this section, and in § 141.80(a)(2), the regulations set forth in this part shall take effect on June 24, 1977.

* * * * *

(c) The regulations set forth in §§ 141.11(d); 141.21(a), (c) and (i); 141.22(a) and (e); 141.23(a)(3) and (a)(4); 141.23(f); 141.24(e) and (f); 141.25(e); 141.27(a); 141.28(a) and (b); 141.31(a), (d) and (e); 141.32(b)(3); and 141.32(d) shall take effect immediately upon promulgation.

* * * * *

(j) The arsenic maximum contaminant levels (MCL) listed in § 141.62 is effective for the purpose of compliance on January 23, 2006.

Requirements relating to arsenic set forth in §§ 141.23(i)(4), 141.23(k)(3) introductory text, 141.23(k)(3)(ii), 141.51(b), 141.62(b), 141.62(b)(16), 141.62(c), 141.62(d), and 142.62(b) revisions in Appendix A of subpart O for the consumer confidence rule, and Appendices A and B of subpart Q for the public notification rule are effective for the purpose of compliance on January 23, 2006. However, the consumer confidence rule reporting requirements relating to arsenic listed in § 141.154(b) and (f) are effective for the purpose of compliance on March 23, 2001.

(k) Regulations set forth in §§ 141.23(i)(1), 141.23(i)(2), 141.24(f)(15), 141.24(f)(22), 141.24(h)(11), 141.24(h)(20), 142.16(e), 142.16(j), and 142.16(k) are effective for the purpose of compliance on January 22, 2004.

Subpart B—[Amended]

4. Amend § 141.11 by revising the second sentence of paragraph (a) and revising paragraph (b) to read as follows:

§ 141.11 Maximum contaminant levels for inorganic chemicals.

(a) * * * The analyses and determination of compliance with the 0.05 milligrams per liter maximum contaminant level for arsenic use the requirements of § 141.23.

(b) The maximum contaminant level for arsenic is 0.05 milligrams per liter for community water systems until January 23, 2006.

* * * * *

Subpart C—[Amended]

5. Amend § 141.23 by:

a. Adding a new entry for "Arsenic" in alphabetical order to the table in paragraph (a)(4)(i) and adding endnotes 6, 7 and 8,

b. Revising paragraphs (a)(5) and (c) introductory text,

c. Adding paragraph (c)(9),

d. Revising paragraphs (f)(1), (i)(1), and (i)(2),

e.–h. Adding paragraph (i)(4),

i. Revising the entries for arsenic in the table in paragraph (k)(1),

j. Revising paragraph (k)(2) introductory text,

k. Adding a new entry for "Arsenic" in alphabetical order to the table to paragraph (k)(2) and revising footnote 1,

l. Revising the last sentence in paragraph (k)(3) introductory text, and

m. Adding a new entry for "Arsenic" in alphabetical order to the table in paragraph (k)(3)(ii).

The revisions and additions read as follows:

§ 141.23 Inorganic chemical sampling and analytical requirements.

(a) * * *

(4) * * *

(i) * * *

DETECTION LIMITS FOR INFORGANIC CONTAMINANTS

Contaminant	MCL (mg/l)	Methodology	Detection Limit (mg/l)
*	*	* * * * *	*
Arsenic	[6]0.01	Atomic Absorption; Furnace	0.001
		Atomic Absorption; Platform—Stabilized Temperature	[7]0.0005
		Atomic Absorption; Gaseous Hydride	0.001
		ICP-Mass Spectrometry	[8]0.0014
*	*	* * * * *	*

* * * * *

[6] The value for arsenic is effective January 23, 2006. Unit then, the MCL is 0.05 mg/L.

[7] The MDL reported for EPA method 200.9 (Atomic Absorption; Platform—Stablized Temperature) was determined using a 2x concentration step during sample digestion. The MDL determined for samples analyzed using direct analyses (i.e., no sample digestion) will be higher. Using multiple depositions, EPA 200.9 is capable of obtaining MDL of 0.0001 mg/L.

[8] Using selective ion monitoring, EPA Method 200.8 (ICP–MS) is capable of obtaining a MDL of 0.0001 mg/L.

* * * * *

(5) The frequency of monitoring for asbestos shall be in accordance with paragraph (b) of this section: the frequency of monitoring for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium shall be in accordance with paragraph (c) of this section; the frequency of monitoring for nitrate shall be in accordance with paragraph (d) of this section; and the

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

June 23, 2003

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ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

Edward M. Snyder, Ph.D.
Chair
West Virginia Environmental Quality Board
1615 Washington Street, East, Suite 301
Charleston, West Virginia 25311

Re: Proposed Changes to Water Quality Standards; 46 CSR 1.

Dear Chairman Snyder:

The West Virginia Chamber of Commerce is pleased to have the opportunity to comment on the proposals of the Environmental Quality Board ["Board"] to change and significantly expand the State's water quality standards. These comments are offered on behalf of the 4,000 members of the West Virginia Chamber of Commerce ["Chamber"] who represent virtually every aspect of the State's business community.

The Chamber was also pleased to have the opportunity to comment on these rules at the public hearing held on June 18, 2003. We specifically incorporate into these comments the hearing statements offered by Tom Boggs, Charlie Armstead, Mindy Armstead, and Joyce McCune Gentry.

In addition, the West Virginia Chamber of Commerce along with other trade associations have retained the environmental consulting firm of Acacia Environmental Group to comment on numerous technical aspects of the rule. We specifically incorporate the comments of Acacia Environmental Group into these comments.

1. Lack of federal mandate.

It appears from the Board's proposal that it is undertaking these significant and widespread changes to its rule in great part because of its effort to update its regulations on a triennial basis to satisfy the requirements of the federal Clean Water Act. The Board has apparently sought to discharge this obligation by incorporating on an across-the-board basis, all of the criteria for toxic pollutants that have ever been developed by EPA for application to any part of the country.

The Chamber strenuously objects to this approach as being unduly and unnecessarily stringent. The approach ignores the alternatives that are available to the State under EPA's National Toxics Rule published on December 22, 1992 (57 Fed.Reg. 60848). The National Toxics Rule makes it clear that West Virginia may satisfy the

requirements of that Rule by adopting numeric criteria only in those cases where it is determined that the toxic pollutants involved are present and can be reasonably expected to interfere with designated uses. In addition, the National Toxics Rule allows the State of West Virginia, as part of its narrative water quality standards prohibiting toxics in receiving streams, to calculate state specific criteria for any toxic pollutants and could reasonably be expected to interfere with designated uses.

Given the fact that many of these criteria are at levels that are below the limits of analytical detection and given the significant costs to the regulated community related to sampling and analysis (even putting aside costs associated with control technology), we believe that it is incumbent on the Board to reconsider this position and to adopt a more flexible approach specifically authorized under the National Toxics Rule.

2. **Length of comment period.**

Even though the Chamber has been an active participant in previous triennial reviews and has followed closely the activity of the Board leading up to the proposal of these regulations, it has been extremely difficult for the Chamber and its consultants to be able to adequately assess the proposals that have been advanced by the Board within the short thirty (30) days that have been allowed to comment.

Additional time is needed for the Board to undertake a more thoughtful consideration of the proposed rules and their impact on the regulated community and for the regulated community itself to have an opportunity to further explore the many new issues that have not yet been addressed in connection with this proposal. Among these issues include whether it is necessary for West Virginia to adopt criteria for all of these pollutants, whether the criteria adopted should be custom made for application to West Virginia and whether the standards can be justified given their cost impact on the regulated community. These and many other comments set forth elsewhere in this document will all require time for both the Board and commenters to adequately assess.

The Chamber urges the Board to recognize that the establishment of the State's water quality standards is a matter of great significance that needs to be pursued in a careful and thoughtful manner. To avoid a rush to judgment, we urge that the Board withdraw its proposals and to immediately undertake the preparation of supporting materials that would result in the promulgation of a new rule with a more appropriate technical and policy basis.

3. **Public water supply use designations.**

It is critical to the establishment of these regulations that the Board establish which receiving streams are subject to the Public Water Supply Use designation. This has been a matter that has been the subject of much debate not only before the Board but also before the Legislature.

We note with concern that the Board has proposed the deletion of that part of its regulation that specifically identifies known public water supplies. We believe that deletion of the list of known public water supplies is inconsistent with the importance of establishing which receiving streams in fact have the designated use of public water supply. We urge the Board to allow Appendix B to remain in the rule and to supplement that list as appropriate to include all public water supplies that are known to currently exist.

If the Board intends any different result, namely, application of the Public Water Supply Use designation to all streams of the State (a result that we believe is not well founded), it would need to do so by adopting a legislative rule that would satisfy the mandates of the Legislative Rule-Making Review Committee as communicated to the Board earlier this year.

In addition, it is critical to clarify the extent to which the Public Water Supply Designated Use applies to the State's streams in order to determine the cost impact of the numerous proposals that the Board has advanced for application to the Public Water Supply Designated Use.

4. <u>Resolution of design flow considerations.</u>

As the Chamber pointed out in its May 8, 2003, letter to the Board, it is the policy of EPA to adopt water quality criteria for carcinogens that assume that those criteria will be implemented on the basis of harmonic mean flow as opposed to 7Q10 flow that the Board currently applies. The Board's decision to delay resolution of these issues means that a fundamental assumption underlying the adoption and application of EPA's water quality criteria has not been met.

It has been the Board's longstanding policy that the regulation of carcinogens in West Virginia should be based on the protection of human health at the 10^{-6} risk level. As the Board pointed out in its August 19, 1991 rationale document in support of revisions to its water quality standards at that time:

> Since this [10^{-6} risk level] is the upper limit of allowable risk, and assumes a lifetime daily exposure to the maximum allowable amount of carcinogen, the Board considers 10^{-6} risk to be essentially negligible risk, appropriate, and protective of human health in the state. The real issue, therefore, is not what the loadings of pollutants to streams may be as measured in absolute terms, but rather we are regulating the discharge of those pollutants to streams in a way that meets the statewide policy of regulating carcinogens to a 10^{-6} risk level.

EPA's human health water quality criteria for carcinogens are protective of a 10^{-6} risk level when applied through the application of harmonic mean flow. Application of

these criteria through the implementation of a 7Q10 flow is inconsistent with the basis upon which EPA's water quality criteria were adopted.

The Chamber urges that the Board either delay the proposal to revise its criteria for carcinogens pending resolution of the harmonic mean flow issue, or in the alternative, to withdraw the current rule and to re-propose it after revised criteria have been calculated that assumes that the criteria are to be applied through a 7Q10 flow.

5. Assessment of economic impact.

Perhaps the most significant concern about the Board's current proposal is its complete failure to have assessed the cost impact of its proposed changes on the regulated community. Such an assessment is specifically mandated by the Legislature under the Administrative Procedures Act (W.Va. Code §29A-3-4) and under the State's Water Pollution Control Act which provides at W.Va. Code §22-11-2 that:

> It is declared to be the public policy of the state of West Virginia to maintain reasonable standards of purity and quality of the waters of the state consistent with (1) public health and public enjoyment thereof; (2) the propagation and protection and animal, bird, fish, aquatic and plant life; and (3) the expansion of employment opportunities, maintenance and expansion of agriculture and the provision of permanent foundation for healthy industrial development.

The Board is advancing these proposals at a time of extraordinary competition among out states and at a time of extraordinary economic pressure on West Virginia's businesses. At the same time, the State is dedicating enormous resources into the development of new water quality programs in such areas as TMDL, antidegradation, water quality trading, and many others. Proposals such as this one cannot be taken lightly and the impact of these proposals simply must be assessed on the regulated community and in the context of all of the other significant regulatory programs that are currently being pursued in the implementation of the State's water quality goals and objectives.

6. Organoleptics proposal is inappropriate.

We note with particular concern that the Board has proposed to revise the manner in which water quality standards would treat organoleptics. At the outset we note that organoleptics are based on aesthetic standards and not human health or aquatic life impacts. Moreover, we recognize that the current rules address this issue through a narrative standard prohibiting objectionable color, odor and taste, which we believe have provided an appropriate basis for addressing aesthetic considerations. The numeric organoleptic criteria that are referred to by the Board in its proposed rules are particularly problematic because of their extremely low numeric values and because there is no

guidance offered as to when a permit writer would be required to apply those standards. We urge the Board to withdraw its proposed revisions to its rule addressing organoleptic standards and to allow aesthetic issues to be addressed with the current narrative standards.

7. **Application of drinking water criteria.**

As is pointed out in greater detail in the comments that have been filed by Acacia Environmental Group on behalf of the Chamber and others, the Board has adopted water quality criteria for a number of parameters based upon drinking water criteria usage. Our concern about this action is based in the fact that the drinking water standards are adopted for application to water that has undergone treatment and are not intended to be applied to ambient drinking water supplies. The Board should rely instead on those EPA criteria that are intended to be applied to ambient/in-stream water quality and not to those standards that are intended to be applied to water supplies after they have undergone treatment.

8. **Trout waters.**

The Chamber is extremely concerned about the significant expansion of the listing of trout waters contained in Appendix A to the proposed rule. This concern is based in great part on the failure on the part of the Board to offer any explanation as to the basis for the addition of these streams to the listing of trout waters. It is our concern that many of the streams that have been added to the list are streams which contain trout only as a result of annual stockings and therefore do not meet the definition of trout stream which requires the stream to "sustain year-round trout populations."

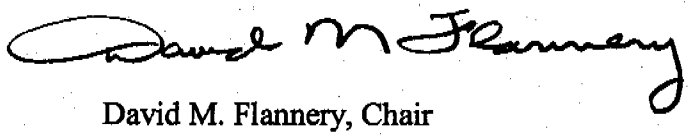
Because the water quality standards for trout streams are significantly more stringent than for other streams and because inclusion on the trout stream list significantly effects the manner in which that stream will be regulated under the State's antidegradation policy, we believe that a high hurdle should be established for inclusion of a new stream on the trout stream list. We urge the Board to withdraw its proposals to list additional streams as trout waters unless and until the Board can establish that the stream is capable of sustaining year-round trout populations and unless and until the Board has undertaken an assessment of the cost impact of that listing as required by W.Va. Code §29A-3-4.

Conclusion

The proposals that the Board has advanced have gone too far, too fast. The Board should withdraw these proposals in favor of conducting an assessment to determine which of EPA's criteria are required to be adopted under EPA's National Toxics Rule. In addition, the Board needs to resolve threshold issues related to drinking water supply and harmonic mean flow before the application of any new criteria for carcinogens can be assessed. In addition, the Board simply must find a way to assess the impact of these various proposals on the regulated community as required by law.

The West Virginia Chamber of Commerce looks forward to working with the Board in addressing these concerns about its proposal.

Very truly yours,



David M. Flannery, Chair
Environmental Committee
West Virginia Chamber of Commerce

cc: Edward M. Snyder, Ph.D.
Mr. Edward C. Armbrecht
Robert Jenkins, Ph.D.
Cameron Hackney, Ph.D.
Scott Simonton, Ph.D.

735519

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June 21, 2003

West Virginia Environmental Quality Board
1615 Washington Street East
Suite 301
Charleston, WV 25311-2126 VIA FACSIMILE 304-558-4116

Re: Comments on Proposed Rule Revisions – Title 46

As a consulting environmental engineer I work closely with the Parkersburg Utility Board, the Morgantown Utility Board, and the Charleston Sanitary Board on matters related to water quality and the water quality impacts of wastewater discharges. I also consult with clients in other states and regions of the country, and therefore are familiar with rules in other jurisdictions. Please consider the following comments and suggestions on the draft rule revisions as you move forward with this process. My comments and suggestions are arranged in the order of the Title 46 document.

Title 46 Section	Comment/Suggestion
1.1	"Sewage" is a term that has fallen from usage, and has been replaced by the term "wastewater." This change has primarily been a result of the substantial efforts made over the last 30 years in constructing treatment facilities, and the high quality of effluent generally produced by those facilities. It is recommended that the first sentence of 1.1 be modified to read: "...or deposit or municipal and industrial wastewater, and other wastes, into the waters..."
2.4	There appears to be a grammar problem with the proposed language. It is unclear to me why the "or not" is proposed to be struck, if it is the intent of the rule that the designated uses are applicable even though standards are not being attained.
2.6	The inclusion of the word "operationally" is not necessary and could cause some confusion as to meaning. It is suggested that this word be struck.
3.1	It is suggested that "sewage, industrial wastes or other wastes present in any of the waters of the state" be replaced with "municipal and industrial wastewater, or other wastes present in any of the waters of the state,..."
3.2	Same as 3.1
4.1	"state" should be "State" since West Virginia is named in the sentence.
4.1.a	Same as 2.4
5.2.b	Determination of appropriate mixing zones is, necessarily, a case-by-case process. It is unclear why EQB wishes to remove alternative 1 of EPA's TSD. Since this is case-by-case, and upon the discretion and technical judgment of the Director, it is requested that the original language be retained.
5.2.c	In the last sentence it is stated that a mixing zone for human health criteria is not allowed for a $Q_{7,10}$ less than 5 cfs. This appears arbitrary and it is requested that the sentence be removed. There could be cases where a discharge is small relative to 5 cfs, or other case-by-case conditions which would result in a mixing zone being appropriate even on a small stream.

West Virginia Environmental Quality Board
June 21, 2003
Page 2 of 3

5.2.h.6	The "1/2" should be "(1/2)"
5.2.j	The ability to define a mixing zone based on demonstrated site-specific information is vital. This provision should be broadened to include 5.2.f in the list of subsections for which a waiver may be obtained based on an acceptable demonstration. Induced mixing zones in lakes and reservoirs significantly higher than 10:1 have been demonstrated for certain discharge situations. Including 5.2.f in the list should not be of regulatory concern, since an adequate demonstration must be provided for the waiver to be granted by the Director.
5.2.k	This provision is problematic if a waiver is granted by the Director under 5.2.j. If 5.2.k is to be retained, the following language should be added: "...and 5.2.h.2, herein, unless a waiver from one or more of these provisions is granted by the Director under subsection 5.2.j." However, given the language of 5.2.l, subsection 5.2.k appears unnecessary. It would not be reasonable for the Director to require a technical submittal for each and every case where a mixing zone is established. Preparation and review of such submittals would be costly and a burden on permittees and the Director's staff. Most jurisdictions allow mixing zones in many cases based upon technical judgment, experience and "rules of thumb." Subsection 5.2.l, therefore, should be relied on and subsection 5.2.k deleted.
6.1.b	The first sentence places no reasonableness or economical limitations on effluent limitations for point source discharges, whereas the wording "cost-effective and reasonable best management practices" is used in reference to non-point sources. This is not an even-handed approach to assessing the achievability of designated uses. This sentence should be reworded to state: "...by the imposition of reasonably achievable effluent limits under section 301(b) and section 306..."
7.2.c.3	It is unclear why reference is made to a zone of initial dilution being required. A mixing zone or zone of initial dilution is granted by the Director based on a case-by-case analysis. It is recommended that this language be revised to read: "In any assigned zone of initial dilution or any mixing zone established under subsection §5.2.b herein..." This change needs to be made, since some could argue that since a ZID or MZ is not required that the numeric water quality standards should always apply (even in ZIDs or MZs).
8.1.d	"water use categories" should be "Water Use Categories"
8.3	"any of" needs to be inserted in the second sentence prior to the words "the conditions."
	APPENDIX E TABLE 1 (comments as follows)
1 – 4	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
7	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
8	Please review the numeric standards for Antimony. It does not make sense that the acute standard for human health would be lower than the chronic standard.
12 – 17	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
19 – 26	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
29	Please review the proposed standards for this organic compound. The proposed human health standard is lower for acute than for chronic toxicity.
32 – 36	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
42	Please review the proposed standards for this organic compound. The proposed human health standard is lower for acute than for chronic toxicity.

43.a	What is the basis for the new proposed aquatic life standards for total copper? These should be deleted as adequate protection of aquatic life is provided with the dissolved copper standards of 43.b and 43.c. Note that, for a hardness of 150 mg/L, 43.b and 43.c result in dissolved copper concentrations of 16 ug/L (chronic) and 25 ug/L (acute), both substantially higher than the 9 and 13 ug/L total copper values.
49 – 75	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
76.a	The proposed language of 76.a appears unworkable because of holding times. By the time the *fecal coliform* result were available, the original sample could not be re-tested for e. *coli*. Perhaps the best approach here would be to allow the use either the *fecal coliform* or *e. coli* standard. The language of the second sentence would then read: "Alternatively, compliance with the provisions of this section is demonstrated if *E. coli* levels meet USEPA's recommended criteria."
77 – 78 and 81	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
84 – 89 and 91	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
92.a	Please review the human health criteria for lead. The acute and chronic standards are indicated to be the same value.
101.a	What is the basis for the new proposed aquatic life standards for total nickel? These should be deleted as adequate protection of aquatic life is provided with the dissolved nickel standards of 101.b and 101.c. Note that, for a hardness of 150 mg/L, 101.b and 101.c result in dissolved nickel concentrations of 222 ug/L (chronic) and 1,994 ug/L (acute), both substantially higher than the 52 and 470 ug/L total copper values.
98 – 99	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
103 – 110	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
114 – 115	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
117 – 121	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
128	Please review the proposed standards for this organic compound. The proposed human health standards has a proposed values for acute than for chronic toxicity.
130 – 138	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
140 – 143	Please review the proposed standards for these organic compounds. The proposed human health standards have lower proposed values for acute than for chronic toxicity.
145	Please review the proposed standards for this organic compound. The proposed human health standards has a proposed values for acute than for chronic toxicity.

Sincerely,

MICHAEL DORAN TECHKNOWLEDGE, LLC



Michael D. Doran, P.E. DEE
President

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West Virginia Coal Association

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JUN 23 2003
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

June 23, 2003

Dr. Ed Snyder
Chairman
Environmental Quality Board
1615 Washington Street, East
Suite 301
Charleston, West Virginia 25311-2126

Re: Triennial Review of Water Quality Standards (46 CSR 1)

Dear Dr. Snyder:

The West Virginia Coal Association appreciates this opportunity to submit written comments on the proposed revisions to the Requirements Governing Water Quality Standards (46 CSR 1).

Our comments will focus on the Environmental Quality Board's (EQB) request for comments and suggestions on the recommendation to remove the exemption to the numeric criterion for turbidity that is currently in place for activities where an approved Federal or State Surface Mining permit is in effect (Section 8.32.2). While these comments are being offered in response to the EQB request for public comments, it does not appear that the EQB provided adequate notice of intent to change the turbidity standard. There was no proposed change in the body of the text, just a reference in a cover document that the EQB was considering Ms. Margaret Janes' request to remove the exemption for mining related activities.

In addition to these comments, the West Virginia Coal Association is participating in a joint industry comment effort along with other trade organizations that will be filed separately.

Comment 1: Turbidity is a criterion that is not used by our neighboring states

The border states of Ohio, Kentucky, Virginia, and Pennsylvania do not have numeric criteria for turbidity. Maryland is the only neighboring state with criteria for turbidity.

The Board has heard on many occasions our industry's concerns regarding the competitiveness of our product with other producers in this country and abroad. Everyone produces what is essentially the same product. The result is that the decision on where to purchase one's coal comes down to price. Many factors influence the price of West Virginia coal and its competitiveness with other producers. Many, such as transportation, geology and labor costs are beyond any possible influence by this Board.

The cost of complying with environmental regulations is an area where the Board can make a difference. Environmental compliance is a significant business cost in our industry and we firmly believe that those costs are already higher in West Virginia. That means that this state's coal industry is at some risk. The Board should consider the equity of our regulations with those of surrounding states. This is particularly true for turbidity, which as you will see later, is not the parameter of concern. The ability of an individual citizen to have a positive influence on our state's economy is a rare thing indeed. The Board members, in keeping the exemption for the turbidity standard in place, will be helping to keep economic development alive in the parts of our state that need it most, Southern West Virginia. This can be done at no real cost to water quality in our state.

Comment 2: West Virginia regulations already contain narrative criteria that can be used by inspectors to address the excessive discharge of solids

The current and proposed Water Quality Standards already contain narrative criteria to address the excessive discharge of solids. Section 3 of the regulation specifically prohibits the presence of sewage, industrial wastes or other wastes that cause or materially contribute to the following conditions, "distinctly visible floating or settleable solids, suspended solids...deposits or sludge banks on the bottom...materials which are harmful, hazardous or toxic to man, animal or aquatic life...distinctly visible color..."

This section of the regulation is more than sufficient to provide agency inspectors with the necessary tools to address the excessive discharge of solids or turbidity-causing substances. Removal of the exemption and application of the turbidity standard would be redundant.

Comment 3: Turbidity is not a pollutant

Turbidity is not a pollutant. Turbidity is a qualitative measure of the optical property of water that causes light to be scattered and absorbed rather than transmitted. Surface water turbidity can be caused by suspended and colloidal matter such as clay, silt, finely divided organic and inorganic matter, color-inducing substances like tannins from leaf litter, and plankton and other microscopic organisms.

The health and environmental impacts that are often attributed to turbidity are actually directly due to suspended solids and colloidal matter in the water column. The turbidity-labeled health concerns in raw water used for drinking water supplies are actually due to the presence of suspended organic and inorganic materials that provide a haven for microbes; shielding them from disinfection. The problem in recreational contact waters is actually high concentrations of suspended solids that obscure underwater hazards or harbor high concentrations of pathogens; not turbidity. Turbidity is not responsible for gill clogging and abrasion in fish – suspended solids are. Declines in fish reproduction through egg and fry mortality are not caused by turbidity; they are caused by siltation. Benthic macroinvertebrates are suffocated or starved by solids that settle on the stream bottom, not by turbidity.

Turbidity is not the cause of these harmful effects; it is only the surrogate used to indicate the presence of the real stressors to the aquatic environment– organic and inorganic suspended solids. Turbidity has historically been used as a water quality standard and indicator of suspended solid concentrations, at least in part, due to the ease and cost of using a nephelometric turbidity meter in the field in comparison to the direct measurement of suspended solids. There are better, readily available analytical methods that can detect and quantify solids in water.

Comment 4: Coal operations are subject to engineering controls and permit limits for the control of solids

Coal mining activities, inclusive of the earth-disturbing activities, are subject to National Pollutant Discharge Elimination System (NPDES) permits. These permits require the submission of detailed engineering plans, certified by a licensed Professional Engineer, showing compliance with engineering controls and best management practices designed to minimize the discharge of solids. For every acre of earth-disturbing activity, coal-mining operations must provide a sediment retention structure with a storage capacity of approximately 5,400 cubic feet, significantly larger than what is merely suggested for other earth-disturbing activities. Coal permit regulations also require that these structures be routinely examined and that built-up solids are removed on a regular basis.

Discharges are subject to mandatory monitoring and reporting. Every two weeks, the discharge from the outfalls at coal mining operations must be sampled and analyzed for a variety of parameters to demonstrate compliance with specific permit limits. One of the permit limits is for total suspended solids. Total suspended solids analysis is a direct measure of the amount of solids present on a filter through which a known volume of water has been passed. Unlike turbidity, this is a quantifiable measure and is expressed in terms of milligrams of solids per liter of water. The daily maximum permit limit is 70 milligrams of solids per 1 liter of water.

Discharges due to a precipitation event, when additional solids are likely to be agitated into the water column, are subject to a settleable solids permit limit. Settleable solids analysis is a measure of the amount of solids that will settle out of a water sample in a 60-minute period. This is also a quantifiable measure and is expressed in milliliters of solids per liter of water. The permit limit is 0.5 milliliters of solids per 1 liter of water.

Department of Environmental Protection (DEP) inspectors visit coal mining operations on a routine basis, typically at least once a month, to ensure that these operations are in compliance with the regulatory and permit requirements. Additionally, all discharge monitoring results must also be submitted to the DEP on a monthly basis. Violations of the sediment control requirements or permit discharge limits can include monetary penalties and the possibility of the enforced shutdown of the operation until the source of the violation is stopped. Unlike other earth-disturbing activities, the requirements to control solids at coal operations are not suggestions and they are not voluntary or optional.

Comment 5: West Virginia's turbidity criterion is outdated and meaningless

The United Stated Environmental Protection Agency (EPA) developed the current federal water quality criterion recommendation for turbidity nearly thirty years ago. It was published in EPA's *Quality Criteria for Water* (1976) and has never been updated. In the EPA document, the criterion is grouped with those for suspended and settleable solids and reads as follows:

Solids (Suspended, Settleable) and Turbidity

> Settleable and suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm to aquatic life.

The light compensation point is the light intensity at which net photosynthesis is zero; that level at which a plant's energy absorption through photosynthesis is matched by the energy costs of respiration. A review of the Environmental Quality Board's (EQB) files associated with the initial adoption of the turbidity criterion in the 1980 revision to the Water Quality Standards was conducted. This review did not produce any documents showing how the West Virginia criterion was developed or what methods, if any, were used to determine the seasonally established norm for the light compensation point in our streams. The current criterion is essentially meaningless.

One addition important point is that the file review did not contain evidence that the criterion was ever reviewed or approved by the EPA.

In the 1980, *Rationale for Revision of Water Quality Standards*, the EQB addressed comments relating to the exclusions to the turbidity criterion as follows:

> Several commenters objected to the exclusion for Best Management Practices, contending that these activities should have no problem in meeting the turbidity criterion. The Board did not accept these comments since it believes that the exclusions encourage participation in and provide an incentive for voluntary compliance with the 208 program. A language change was made to clarify the participant's responsibilities. The same rationale applies to the rejection of a comment asking that no exclusion be allowed for sources covered by Federal or State surface mining permits.

With regard to a comment requesting criteria for settleable solids and total suspended solids, the rationale document states:

> The comment requesting criteria for settleable solids and total suspended solids was rejected. In the development of these criteria, laboratory tests showed a highly significant correlation between settleable solids and NTU. Therefore, separate criteria were not considered necessary.

However, current published information on the subject is replete with data showing that turbidity cannot consistently be correlated with solids concentrations due to the effects of size, shape, and refractive index of the particles in the sample.

In an abstract from a presentation for a turbidity workshop held in Reno Nevada in 2002, William Swietlik, Program Manager for the EPA's Biocriteria Program states that, "In lieu of useful criteria for turbidity, suspended solids and bedded sediments…the States and Tribes are using a variety of approaches to manage these pollutants." The key point in this statement is that EPA believes that the current turbidity criterion is not useful and is in need of revision.

The evaluation of possible criteria initiatives for excessive sedimentation, flow alterations and wildlife is one of the top priorities for the EPA's Criteria and Standards Program. They are currently in the process of preparing a summary of the current state of the science on turbidity, suspended solids and bedded sediments in surface waters. This initial body of information is scheduled to be published in the Federal Register in August 2003. This is the critical first step in arriving at criteria that will be meaningful and useful in addressing the problems associated with solids in streams. West Virginia's standard should not be altered until there is a sound scientific basis for the turbidity criterion.

This criterion was originally implemented in West Virginia as a tool to encourage earth-disturbing activities to utilize the best practical technologies available to control erosion and sedimentation. The impractical nature of the turbidity criterion, which requires a comparison of a discharge's impact to the existing turbidity in the receiving stream at a specific point in time, demonstrates that it was never intended to be implemented through a discharge permit program. Specific numeric limits could not be placed in a permit utilizing this criterion.

Removing the exemption to the numeric criterion for turbidity that is currently in place for activities where an approved Federal or State Surface Mining permit is in effect will reverse almost 30 years of public policy in this state. Further, removal of the exemption will not add any measurable environmental protection or benefit. We do not feel that this is an action that should be undertaken in haste, or without careful consideration of the science and the potential consequences.

We appreciate this opportunity to provide these comments.

Respectfully Submitted,

Jason D. Bostic
Regulatory Affairs Specialist

AQBEQB CLERK - MWQA Comments on the Triennial Review of WQS

From: "Paul Calamita" <Paul@aqualaw.com>
To: "Melissa Carte" <clerk@aqbeqb.state.wv.us>
Date: 6/23/2003 4:37 PM
Subject: MWQA Comments on the Triennial Review of WQS
CC: "Libby Chatfield" <lchatfield@aqbeqb.state.wv.us>, "David Sago" <davidsago@aol.com>, "Timothy P. Stranko" <tstranko@mub.org>, "Kathleen Rushworth" <krushworth@csbwv.com>, "A. King Campbell" <fit4ak@aol.com>, "Stephen Knipe" <s_knipe@email.msn.com>, "Ronald Dodson" <rdodson004@aol.com>, "Michael Saffel" <mesaffel@inetone.net>, "Daniel E. Ferrell" <dan.ferrell@bridgeportwv.com>

I hope you are doing well.

Attached are the comments of the West Virginia Municipal Water Quality Association on the pending triennial review of the WQS Regulation. Please let me know if you have any questions or should you require additional information about these comments.

Thank you.

Paul Calamita
General Counsel
MWQA

Comments of the West Virginia Municipal Water Quality Association
On the Triennial Review of Water Quality Standards

June 23, 2003

We have reviewed the proposed Triennial Review of the Water Quality Standards Regulation and have the following comments:

Design Flows: We support the use of EPA's recommended design flows. They have been used nationwide, including by most surrounding states, for several decades.

Thus, we recommend changing to the use of the 1Q10 to implement acute water quality standards and the Harmonic Mean Flow for applying human health criteria (carcinogens).

We understand the political debate around the use of the harmonic mean flow, but as a science-based organization, cannot let the issue pass without comment. Changing to the harmonic mean flow (and 1Q10) is not only appropriate, it is the only technically defensible action. Contrary to the political rhetoric, use of the harmonic mean flow will not result in significant increases in chemicals discharged to our waters. The antidegradation and antibacksliding programs will prevent any substantial increases in discharges regardless of what the standards may become.

The harmonic mean flow is protective to a level of one-in-a-million additional cancers over a 70-year life exposure at the full pollutant level of the standard. As a society, West Virginians accept risks many orders of magnitude higher without any controversy. Setting speed limits as 70 miles per hour, allowing youthful as well as older drivers the privilege of driving, setting the drinking age, allowing smoking, the possession of hand guns, eating fast food, allowing people to walk outside during storms (lightening strikes), etc. To draw a line at human health water quality criteria for protection well in excess of one-in-a-million makes no sense – especially given the other safeguards that will prevent any meaningful change in discharge levels from existing (antidegradation, antibacksliding) and future facilities (new source performance standards).

Put another way, it is like setting the speed limit on one 10-mile stretch of Interstate 79 at 25 miles an hour in the name of safety (1 death per year as opposed to 3 deaths per year at 70 miles-per-hour) while there is absolutely no difference between those 10 miles and the rest of the road – which is regulated at 70 mph. It is illogical. Such arbitrary decision-making unnecessarily chills interstate confidence in the governance of West Virginia.

Thus, we think a decision not to adopt the harmonic mean is technically indefensible and completely out of step with the realities of the risks levels that we routinely accept and impose across society in our every day lives.

That said, to the extent the Board does follow our recommendation and adopt the EPA-recommended standards, we are concerned about the change from using the 7Q10 to

the 1Q10 to implement acute water quality standards. This may result in additional effluent limits as well as limits at lower levels for many dischargers to smaller streams around the State. If this turns out to be the case, it will be important for both the EQB and the DEP to provide adequate time and technical assistance to affected local governments to assess site-specific as well as other affordable compliance options. In particular, DEP should work with such dischargers well in advance of permit reissuance to ensure a proper mixing zone determination can be conducted.

Mixing Zones (46-1-5)

5.2.b regarding Zones of Initial Dilution.

We believe EPA's options in the Technical Support Document for establishing ZIDs are arbitrary and too restrictive. Accordingly, they should be advisory only. This will allow the Director the discretion to establish more reasonable ZIDs as appropriate – especially for small dischargers as well as dischargers to small streams.

By way of example of the restrictiveness of the TSD approach, the option for high velocity discharges (> 3 meters per second) requires that the acute criterion should be met within 50 times the discharge length scale (50 times square root of the pipe diameter). The scientific basis for this alternative is that these conditions will ensure that the acute criterion is met within a few minutes under practically all conditions. Acute criteria are designed to be protective for one-hour exposures, so this alternate should be protective of drifting organisms.

However, there does not appear to be any scientific basis for this provision. The acute water quality standards are protective for a one-hour exposure. Therefore, there is no reason to try to limit the acute mixing zone to just "a few minutes." We are concerned that this provision results in unduly stringent mixing zones for small discharges that pose little potential for any water quality impacts. For example a discharge from a 72 inch pipe would have a mixing zone of approximately 123 feet while a discharge from a 4 inch pipe would only get a mixing zone of 29 feet. Finally, smaller dischargers are likely to be more heavily impacted by the compliance costs.

Another example is the option that would limit a ZID to 5 times the local water depth in any horizontal direction. The basis for this requirement is to ensure that mixing zones are not established in shallow, near-shore waters. This criterion has unnecessarily precluded discharges in near-shore waters.

Based on the foregoing, we propose that instead of specifying that a ZID "shall be determined using alternatives 2 through 4 outlined in Section 4.3.3 of US EPA's Technical Support Document...." we believe Section 5.2.b should be revised to say that a ZID "may be determined using alternatives 2 through 4 ....."

Category A: Section 6.2

We remain opposed to the designation of all waters as being suitable for public water supply. As we have written previously, we believe such an approach is unnecessary and reckless from a public health perspective. Moreover, it is technically indefensible in this day and age to even suggest such a sweeping statewide designation in the face of monitoring data about natural conditions that would preclude public consumption of

untreated surface waters across the State. Accordingly, we remain opposed to the proposed removal of the list of Category A waters provided in Appendix B and the application of Category A statewide.

Category C: Water Contact Recreation; Section 6.4

We urge the Board to adopt several categories of water contact recreation, ranging from primary contact to secondary contact to uses such as boating. This will allow the Board to apply more appropriate subclasses of the water contact use during appropriate periods (seasonally) as well as when surface waters are influenced by wet weather and other conditions (high flow) that make all types of contact recreation inadvisable.

Appendix E (Table 1).

We object to the presentation of Table 1 in this proposal. It could not have been made more difficult for the public to understand the proposed changes. Instead of showing NEW and DELETED text, everything is indicated as "NEW" text. The Board should require the staff to republish Table 1 showing the new and deleted text for another 30 days of public comment. The public should not have to perform a side-by-side comparison of more than 150 water quality criteria in order to understand what the Board proposes to do with the Water Quality Standards regulation. This approach hindered the public's ability to provide meaningful comments and imposed an unnecessary burden (time and effort) on commenters to glean where the changes are.

Finally, we are very concerned over the statement in the proposal that the Board has only looked to update its water quality standards where the existing standards are less stringent than an updated standard by EPA. We believe the Board should update all of the standards using the best information available to the Board. Other programs (antidegradation and antibacksliding) serve to minimize the effect of any standards updated to be less stringent. We do not believe the Board was charged to apply good science only when it will lead to more stringent requirements. The standards should all be based on the best science. The Board and DEP have many other tools at their disposal to address the implementation of those standards.

We are appalled that the Board would ignore updates to the standards given that the standards are the building blocks for so much of the Clean Water Act. For example, where standards would be raised, impaired water determination might be avoided, thereby avoiding the misallocation of agency as well as regulated community resources.

We believe that the Board should also direct the staff to identify any standards that should be made less stringent as part of a supplemental public notice on this triennial review.

Finally, as part of the Board's response to these comments, we specifically request to know whether the Board's staff or the Board itself made the decision to only seek to update standards that will be more stringent as opposed to all of the standards.

Updating Bacteria Standards.

We support the proposal for fecal coliform (Parameter 76a) to allow an alternative compliance determination to be made using EPA's proposed e.coli standards. However,

we object to the provision in footnote "e" that would require "evenly" spaced samples over the course of a month. This is unnecessary and should be removed or, alternatively, revised to say "reasonably" spaced samples as currently required NPDES bacteria monitoring is unlikely to be "evenly" spaced over a month.

Furthermore, we note that EPA's May, 2002 guidance on implementing the new criteria includes the following statement in Section 5.2.2:

"EPA recommends, but would not require, that states and authorized tribes use only the geometric mean component for NPDES water quality-based effluent limits."

Accordingly, we ask that the Board clarify in footnote "e" that only the monthly geometric mean for e. coli should be used for water quality standards compliance purposes.

Finally, the term, "one sided confidence limit" in footnote "e." should be clarified. The following excerpt from EPA guidance clarifies the issue:

"When the criteria were published in 1986, they were based upon specified illness rates for fresh and marine recreational waters. Specific single sample maximum values were derived using percentiles (referred to as "confidence levels" in the criteria document) associated with the geometric mean and observed standard deviation and were given descriptive headings based on the suggested application of the maximum values to varying use intensities."

The Board is urged to use this same terminology. The percents listed in footnote "e" of the current triennial review document should be identified as upper percentiles and not confidence limits.

Wet Weather Designated Use and Water Quality Standards.

We applaud the Board for its commitment to evaluate appropriate wet weather use and water quality standards on a parallel track to this rulemaking. Developing meaningful wet weather uses and standards is one of the most significant remaining water quality challenges statewide. This is particularly the case for our State given the topography and the resulting wet weather impacts to our rivers. We look forward to the opportunity to work with the Board and its staff on this important initiative and look forward to developing a more concrete approach for consideration in a future water quality standards rulemaking.

End.

Environmental Engineers/Consultants
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June 23, 2003

Mr. Ed Snyder, Chair
Environmental Quality Board
1615 Washington St., East, Suite 301
Charleston, WV 25311-2126

Dear Mr. Snyder: Re: Proposed Fecal Coliform Water Quality Standard

Lombardo Associates, Inc. (LAI) is an environmental engineering and consulting firm that has worked in the West Virginia Counties of Fayette, Monongalia and Berkeley as well as for West Virginia University and the Small Flows Clearinghouse during the past 20 years. LAI specializes in decentralized and small community wastewater management issues that are most applicable to West Virginia communities. LAI has been the Engineer of Record for over $200 million of decentralized wastewater systems and has received the American Consulting Engineers Council (ACEC) Engineering Excellence Award for our innovative decentralized wastewater projects. Also, I was named a Construction Man of the Year Candidate by *Engineering News Record* for our wastewater projects. LAI has performed extensive water quality studies and I am the author of the first version of the widely used and EPA supported HSPF water quality model, which I believe is used by the WV DEP.

Lombardo Associates, Inc. is currently working in Fayette County addressing wastewater management issues that are causing bacterial water quality violations that threaten the County's economically vital water contact recreational industry. We are aware of the serious combined sewer overflow (CSO) and direct discharge of untreated wastewater issues in Fayette County and their impact on bacterial water quality standards violations and the resulting public health risks.

We respectfully recommend that the proposed changes to the Fecal Coliform criteria in Appendix E, Water Quality Criteria, 76.a Fecal Coliform that allow for further testing for Escheria Coli when noncompliance of the Fecal Coliform Standard occurs be withdrawn for the following reasons:

1. The wording of the proposed change could be misinterpreted to allow re-sampling. It should be explicitly stated that re-sampling is not allowed as that would encourage the approach of sampling until a non-violation occurs.

2. The practicality of sample holding times and preservation makes the option of further testing for e. coli not implementable. According to the EPA approved Standard Methods for the Examination of Water and Wastewater, fecal coliform results would not be known for at least 24 + hours and e. coli must be analyzed for within 8 hours of sample collection.

The EQB may wish to amend the propose change to provide for a transition period from the fecal coliform standard to the EPA recommended e. coli standard. A transition period would allow correlations to be developed.

The criticality of a strong bacterial water quality standard cannot be understated for protection of public health and the economic interests of Fayette County. Maintenance of bacterial water quality standards is a primary basis for needed wastewater system improvements. The loss of a strong standard, comparable to other States and EPA guidance, would place in jeopardy funding for municipal wastewater projects, as well as compromise public health protection.

Thank you for the opportunity to present comments on this critical issue.

Yours truly,

Pio S. Lombardo, P.E.
President

June 17, 2003

To: West Virginia Environmental Quality Board
1615 Washington East Street, Suite 301
Charleston,WV 25311-2126

From: Randy Boyd, Plateau Action Network
P.O. Box 482
Fayetteville,WV 25840

Re: REVIEW OF WATER STANDARDS RULE: COMMENTS RELATED TO NEWLY PROPOSED FECAL COLIFORM STANDARDS

Dear Board :

The Plateau Action Network (PAN), a nonprofit citizens group located in Fayette County dedicated to sustainable economic development and environmental management urges the board to reconsider proposed changes to the fecal coliform criteria for contact recreation .PAN is also part of the Fayette County Water Quality Coalition (FCWCQ). The FCWQC is a group of ,local government officials ,health care providers environmental groups ,citizens and business leaders including the West Virginia Professional River Out fitters (WVPRO). The FQWC understands the importance of wastewater infrastructure to the health of it's economy and clean water to the health of it's residents and the tourist industry. The FCWQC with PAN'S support in the last year has received a 400,000 dollar direct appropriation from Congress, to develop a county wide comprehensive wastewater treatment plan, along with two million dollars worth of wastewater infrastructure improvements through the Corps of Engineers. PAN appreciates the opportunity to comment on these changes, however we strongly oppose these changes for the following reasons :

1. The proposed changes read that if sampling indicates a violation of the fecal coliform standard, additional tests for E. coli should be run for that sample to be considered to be a violation.This second E. coli test would have to exceed the EPA recommended standard for E. coli. The problem is that by the time the results from the first fecal coliform tests return from the laboratory, which can be up to several days, the conditions that produced the high fecal coliform counts may no longer be present . Thus when the second sample is taken E. coli counts may be low, but do not reflect conditions and circumstances of the original fecal coliform violation. In essence this gives samplers two opportunities to avoid a violation and boils down to the basic laws of probability.

2. Included you will find documentation of over 60 bypasses of untreated sewage due to rainfall events on Piney Creek in Raleigh County. According to a WV DEP employee "the city of Beckley alone bypasses literally hundreds of millions of gallons of raw sewage into Piney Creek each year." These by- passes are episodic and may last anywhere from several hours to usually no longer than a day. The National Park Service has documented extremely high fecal counts and E. coli in this stream during rainfall

events corresponding to these bypasses. Under the existing fecal standard you would expect that a random sample would yield a one out of six chance of catching these bypass plumes and their corresponding high levels of fecal coliform. This is based on 60 bypasses a year and 365 days in a year. Under the proposed standard the simple laws of probability greatly increase the odds that bacterial violations as a result of bypasses will be documented. By requiring a second test to establish a violation, the odds of catching a bypass plume and the corresponding high bacterial levels increase to 1 out of 36, a significant increase from the theoretical probability of 1 out of 6 under the current standard.(DURING THE FIRST TEST THE ODDS OF CATCHING THE PLUME ARE ONE OUT OF SIX . DURING THE SECOND TEST THE ODDS OF CATCHING THIS PLUME ARE ALSO ONE OUT OF SIX. HOWEVER THE ODDS OF CATCHING THAT PLUME IN TWO TESTS IN A ROW AND THUS RECORDING THAT SPECIFIC VIOLATION ARE 1/6 TIMES 1/6 OR ONE OUT OF THIRTY-SIX.)

3.As a result of these new standards it will be difficult to prove all but chronic violations . Therefore the impression will be that water quality has greatly improved when it has not .Ergo there will be no incentive to improve water quality through funding wastewater improvement projects to correct combined sewer over overflows since the water quality appears to be "good." The state's two billion dollar estimate needed to bring adequate sewage to it's residents has just been considerably decreased, not by a real improvement in water quality and sewage treatment, but by a test that uses smoke and mirrors to deceive it's citizens and the hundreds of thousands of tourists that visit our state about the possible public health consequences of recreating in our waters.

4. Under the current proposal , recreational boating is defined as sail boating and motor boats. It is well documented that literally hundreds of thousands of people a year canoe ,kayak ,and raft, our waters. These forms of recreational boating provide a greater opportunity for exposure and ingestion of pathogens from polluted waters than does motor boating .Certainly there are a limited number of opportunities to sail boat in West Virginia. We ask the board to include kayaking, canoeing, and rafting in the definition of boating.

5.Again this new proposal as written will negatively impact the ability to fund projects .I have included an e-mail correspondence from Pio Lombardo , President of Lombardo Associates Inc.(LAI) . Mr. Lombardo a wastewater engineer whose work has received national acclaim states " a major issue with the change is that it will take away much of the basis for reducing bacterial pollution." Mr. Lombardo has worked before in WV and is currently engineering a decentralized wastewater project for Fayette County. Mr. Lombardo plans to submit written comments.

6. There seems to be the notion that requiring split samples from the same location, same time for E. coli and fecal coliform is prohibitive or impractical. Doing this would be the most accurate way of characterizing the health risks while transitioning from the fecal standard .This is our recommendation. Fecal coliform tests are around $20 per sample and according to Jesse Purvis, NPS, PhD. Aquatic Biologist E. coli tests are not much more expensive.

In summary ,please reject these new fecal coliform standards and promulgate a rule that is fair .We recommend you explore a transition period of five years .Another idea would be to explore a transition period in which split samples were taken for both fecal coliform and E.coli during rainfall events . Then anaylize that data to see if there was a strong correlation between fecal coliform violations and E.coli violations ,and if so perhaps the fecal test could continue to be used . The NPS has done this and established a strong correlation between the two.

Sincerely ,

Randy Boyd ,
Plateau Action Network

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh

COMPANY = SHADY SPRINGS

TYPE = ALL

Id Number / Incident Type	Entry Date	County / Recorded By	Caller	Material	Company Name / Date of Spill
22546 Sewage Spill	1/10/00 11:00:00	Raleigh	RUDY ARTHUR	SEWAGE	SHADY SPRINGS 1/10/00 09:00:00
		SPILL LINE			
		Comments : FLOAT BROKEN.			
22547 Sewage Spill	1/12/00 11:30:00	Raleigh	JERRY	SEWAGE	SHADY SPRINGS 1/12/00 11:00:00
		SPILL LINE			
		Comments : POWER OUTAGE.			
22783 Sewage Spill	2/14/00 09:30:00	Raleigh	RUDY ARTHUR	SEWAGE	SHADY SPRINGS 2/14/00 00:00:00
		SPILL LINE			
		Comments : PLANT WASHOUT.			
22784 Sewage Spill	2/14/00 09:11:00	Raleigh	RUDY ARTHUR	SEWAGE	SHADY SPRINGS 2/14/00 08:00:00
		SINCERELY YOURS			
		Comments : OVERFLOW.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh

COMPANY = BECKLEY

TYPE = ALL

Id Number / Entry Date / Incident Type	County / Caller / Recorded By	Material	Company Name / Date of Spill
22454 1/4/00 15:00:00 Sewage Spill	Raleigh BILL GAINER SPILL LINE	SEWAGE	BECKLEY 1/4/00 08:40:00
	Comments : BROKEN FORCE MAIN.		
22455 1/12/00 08:06:00 Sewage Spill	Raleigh DON BUCKLAND SINCERELY YOURS	SEWAGE	BECKLEY 1/11/00 00:00:00
	Comments : FOAM OVERFLOW DIGESTER LID. LESS THAN 15 GALLONS.		
22456 1/19/00 15:00:00 Sewage Spill	Raleigh BILL GAINER SPILL LINE	SEWAGE	BECKLEY 1/19/00 13:00:00
	Comments : CONTRACTOR BROKE FORCE MAIN.		
22457 1/20/00 15:02:00 Sewage Spill	Raleigh MARK MORGAN SINCERELY YOURS	SEWAGE	BECKLEY 1/20/00 14:40:00
	Comments : SPILL. NO OTHER INFORMATION GIVEN ON FORM.		
22590 2/14/00 10:00:00 Sewage Spill	Raleigh DON BUCKLAND SPILL LINE	SEWAGE	BECKLEY 2/14/00 03:00:00
	Comments : A DEAD LINE.		
22591 2/14/00 13:00:00 Sewage Spill	Raleigh BILL GAINER SPILL LINE	SEWAGE	BECKLEY 2/14/00 12:15:00
	Comments : BREAK IN FORCE MAIN.		
22592 2/14/00 10:00:00 Sewage Spill	Raleigh DON BUCKLAND SPILL LINE	SEWAGE	BECKLEY 2/14/00 03:00:00
	Comments : A DEAD LINE.		
22593 2/21/00 15:52:00 Sewage Spill	Raleigh KEN RICHMOND SINCERELY YOURS	SEWAGE	BECKLEY 2/21/00 15:30:00
	Comments : SEWAGE SPILL.		

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY = BECKLEY** **TYPE = ALL**

Id Number / Entry Date / Incident Type	County / Caller / Recorded By	Material	Company Name / Date of Spill
22594 2/22/00 17:25:00 Sewage Spill	Raleigh BILL GAINER SINCERELY YOURS	SEWAGE	BECKLEY 2/22/00 08:20:00
	Comments : BREAK IN FORCE MAIN, HAD TO DIVERT WATER.		
22595 2/22/00 09:30:00 Sewage Spill	Raleigh BILL GAINER SPILL LINE	SEWAGE	BECKLEY 2/22/00 08:20:00
	Comments : PUMP STATION OVERFLOWING.		
22844 3/8/00 10:00:00 Sewage Spill	Raleigh BILL GAINER SPILL LINE	SEWAGE	BECKLEY 3/8/00 09:30:00
	Comments : PUMP STATION FORCE MAIN BROKEN.		
22845 3/11/00 14:36:00 Sewage Spill	Raleigh DON BUCKLAND SINCERELY YOURS	SEWAGE	BECKLEY 3/11/00 14:15:00
	Comments : LIFT STATION OVERFLOW.		
22987 4/4/00 08:35:00 Sewage Spill	Raleigh CHARLES SINCERELY YOURS	SEWAGE	BECKLEY 4/4/00 00:00:00
	Comments : BYPASSING.		
22988 4/7/00 10:00:00 Sewage Spill	Raleigh BILL GAINER SPILL LINE	SEWAGE	BECKLEY 4/7/00 12:20:00
	Comments : PUMP STATION FORCE MAIN BROKEN; HAD TO SHUT DOWN TO DO SOME REPAIRS.		
22989 4/7/00 00:28:00 Sewage Spill	Raleigh RAY PERDUE SINCERELY YOURS	SEWAGE	BECKLEY 4/7/00 00:20:00
	Comments : CHANGING A LINE OVER, CAUSING A BYPASS.		
22990 4/10/00 15:30:00 Sewage Spill	Raleigh BILL GAINER SPILL LINE	SEWAGE	BECKLEY 4/10/00 11:15:00
	Comments : BLOCKAGE IN LINE.		

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY = BECKLEY** **TYPE = ALL**

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
22991 Sewage Spill	4/25/00 12:00:00	Raleigh	BILL GAINER SPILL LINE	SEWAGE	BECKLEY 4/25/00 11:00:00
		Comments :	CONTRACTOR CAUSED PROBLEM DURING CONSTRUCTION. REPAIR CREW ENROUTE.		
23165 Sewage Spill	5/23/00 20:07:00	Raleigh	RAY CLENDENIN SINCERELY YOURS	SEWAGE	BECKLEY 5/23/00 00:00:00
		Comments :	SEWER LINE BURST, WATER LEVEL ABOVE PIPE.		
23484 Sewage Spill	7/24/00 15:30:00	Raleigh	WAYNE BENNETT SPILL LINE	SEWAGE	BECKLEY 7/24/00 13:00:00
		Comments :	HIGH FLOW CAUSED LIFT STATION TO OVERFLOW.		
23666 Sewage Spill	7/31/00 17:02:00	Raleigh	RICK WAGNER SINCERELY YOURS	SEWAGE	BECKLEY 7/31/00 00:00:00
		Comments :	HIGH WATER OVERFLOW.		
23667 Sewage Spill	8/1/00 15:30:00	Raleigh	GREG WHITE SPILL LINE	SEWAGE	BECKLEY 8/1/00 13:30:00
		Comments :	BYPASSING DUE TO RAIN.		
23668 Sewage Spill	8/10/00 09:00:00	Raleigh	GREG WHITE SPILL LINE	SEWAGE	BECKLEY 8/10/00 08:30:00
		Comments :	BYPASSING DUE TO RAIN.		
23669 Sewage Spill	8/14/00 11:46:00	Raleigh	JIM SHAWVER SINCERELY YOURS	SEWAGE	BECKLEY 8/14/00 10:41:00
		Comments :	SPILL DUE TO LEAK IN SSO BOX.		
23670 Sewage Spill	8/18/00 16:46:00	Raleigh	CARL KING SINCERELY YOURS	SEWAGE	BECKLEY 8/18/00 16:30:00
		Comments :	PUMP FAILURE/ REPLACING PUMP, DIDN'T LOSE ANYTHING.		

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY = BECKLEY** **TYPE = ALL**

Id Number / Incident Type	County / Recorded By	Caller / Material	Company Name / Date of Spill
23865 9/8/00 15:00:00 Sewage Spill	Raleigh	GREG WHITE SPILL LINE SEWAGE **Comments :** PUMPS WENT OUT.	BECKLEY 9/8/00 10:30:00
23866 9/25/00 12:28:00 Sewage Spill	Raleigh	JIM SHAWVER SINCERELY YOURS SEWAGE **Comments :** BYPASSING, SSO DISCHARGING.	BECKLEY 9/25/00 11:15:00
23969 10/12/00 13:04:00 Sewage Spill	Raleigh	BILL GAINER SINCERELY YOURS SEWAGE **Comments :** BREAK IN THE FORCE MAIN BESIDE HEAVY TRAFFIC ROAD.	BECKLEY 10/12/00 12:15:00
24147 12/17/00 10:32:00 Sewage Spill	Raleigh	WAYNE BENNETT SINCERELY YOURS SEWAGE & STORMWATER **Comments :** UPSET DUE TO HIGH WATER.	BECKLEY 12/17/00 09:00:00
24241 1/17/01 14:30:00 Sewage Spill	Raleigh	JIM SHAWVER SPILL LINE SEWAGE **Comments :** LIFT STATION OVERFLOWING.	BECKLEY 1/19/01 13:00:00
24242 1/17/01 10:30:00 Sewage Spill	Raleigh	BILL GAINER SPILL LINE SEWAGE **Comments :** RUPTURED FORCE MAIN.	BECKLEY 1/17/01 09:00:00
24243 1/23/01 12:42:00 Sewage Spill	Raleigh	JIM SHAWVER SINCERELY YOURS SEWAGE **Comments :** ELECTRICAL FAILURE ON A BREAKER.	BECKLEY 1/23/01 09:00:00
24379 2/15/01 14:30:00 Sewage Spill	Raleigh	JIM SHAWVER SPILL LINE SEWAGE **Comments :** LIFT STATION OVERFLOWING DUE TO RAIN.	BECKLEY 2/15/01 13:50:00

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh

COMPANY = BECKLEY

TYPE = ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
24380 Sewage Spill	2/25/01 09:23:00	Raleigh	WAYNE SINCERELY YOURS	SEWAGE	BECKLEY 2/25/01 08:00:00
		Comments : STATION DOWN.			
24488 Sewage Spill	3/13/01 11:33:00	Raleigh	GREG WHITE SINCERELY YOURS	SEWAGE	BECKLEY 3/13/01 10:50:00
		Comments : SPILL OF RAW SEWAGE.			
24489 Sewage Spill	3/15/01 14:30:00	Raleigh	JIM SHAWVER SPILL LINE	SEWAGE	BECKLEY 3/15/01 14:15:00
		Comments : LIFT STATION OVERFLOWING DUE TO RAIN.			
24490 Sewage Spill	3/20/01 08:28:00	Raleigh	RAY PERDUE SINCERELY YOURS	SEWAGE	BECKLEY 3/19/01 18:20:00
		Comments : BROKEN FORCE MAIN.			
24491 Sewage Spill	3/20/01 11:31:00	Raleigh	GREG WHITE SINCERELY YOURS	SEWAGE	BECKLEY 3/20/01 10:15:00
		Comments : BYPASSING. NO INFO. ON FORM.			
24492 Sewage Spill	3/22/01 11:20:00	Raleigh	DON BUCKLAND SPILL LINE	SEWAGE	BECKLEY 3/22/01 09:30:00
		Comments : OVERFLOWING DUE TO RAIN.			
24493 Sewage Spill	3/28/01 09:30:00	Raleigh	GREG WHITE SPILL LINE	SEWAGE	BECKLEY 3/28/01 08:50:00
		Comments : WILL PROBABLY BYPASS DUE TO REPAIRS BEING MADE TO THE FORCE MAIN.			
24651 Sewage Spill	4/12/01 15:46:00	Raleigh	BILL GAINER SINCERELY YOURS	CHLORINATED SEWAGE	BECKLEY 4/12/01 15:20:00
		Comments : FORCE MAIN BREAK, LITTLE WHITE STICK PUMP STATION.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh

COMPANY = BECKLEY

TYPE = ALL

Id Number / Incident Type	Entry Date	County / Recorded By	Caller / Material	Company Name / Date of Spill
24652 Sewage Spill	4/13/01 10:47:00	Raleigh	DON BUCKLAND	BECKLEY
		SINCERELY YOURS	SEWAGE	4/13/01 10:10:00
		Comments : UPSET. OVERFLOWING		
24807 Sewage Spill	5/16/01 11:00:00	Raleigh	GREG WHITE	BECKLEY
		SPILL LINE	SEWAGE	5/16/01 09:15:00
		Comments : BYPASSING DUE TO RAIN.		
24808 Sewage Spill	5/17/01 13:00:00	Raleigh	TOM BUCKLAND	BECKLEY
		SPILL LINE	SEWAGE	5/17/01 10:00:00
		Comments : BYPASSING DUE TO RAIN.		
24809 Sewage Spill	5/22/01 10:00:00	Raleigh	GREG WHITE	BECKLEY
		SPILL LINE	SEWAGE	5/22/01 09:30:00
		Comments : OVERFLOWING DUE TO RAIN.		
24817 Sewage Spill	5/23/01 10:00:00	Raleigh	GREG WHITE	BECKLEY
		SPILL LINE	SEWAGE	5/23/01 09:00:00
		Comments : ELECTRIC CONTROL BOX GOT RIPPED OFF.		

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SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh

COMPANY = NORTH BECKLEY

TYPE = ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
22513 Sewage Spill	1/4/00 13:15:00	Raleigh	KIM DEAN / SPILL LINE	SEWAGE	NORTH BECKLEY 1/4/00 11:30:00
		Comments : MAIN PLANT OVERFLOWING DUE TO RAIN.			
22514 Sewage Spill	1/6/00 10:30:00	Raleigh	KIM DEAN / SPILL LINE	SEWAGE	NORTH BECKLEY 1/6/00 09:00:00
		Comments : PUMP FAILURE AT LIFT STATION.			
22515 Sewage Spill	1/10/00 10:00:00	Raleigh	KIM DEAN / SPILL LINE	SEWAGE	NORTH BECKLEY 1/10/00 09:30:00
		Comments : OVERFLOWING DUE TO RAIN. INTERMITTENT APPROX. 8 HRS/DAY.			
22516 Sewage Spill	1/10/00 10:00:00	Raleigh	KIM DEAN / SPILL LINE	SEWAGE	NORTH BECKLEY 1/10/00 14:00:00
		Comments : MANHOLE OVERFLOWING.			
22517 Sewage Spill	1/10/00 10:00:00	Raleigh	KIM DEAN / SPILL LINE	SEWAGE	NORTH BECKLEY 1/10/00 09:30:00
		Comments : ELECTRICAL PROBLEM.			
22718 Sewage Spill	2/14/00 11:00:00	Raleigh	KIM DEAN / SPILL LINE	SEWAGE	NORTH BECKLEY 2/14/00 09:30:00
		Comments : OVERFLOWING DUE TO RAIN. STOPPED.			
22719 Sewage Spill	2/18/00 11:30:00	Raleigh	KIM DEAN / SPILL LINE	SEWAGE	NORTH BECKLEY 2/18/00 09:00:00
		Comments : MANHOLE CLOGGED UP.			
22720 Sewage Spill	2/24/00 09:00:00	Raleigh	KIM DEAN / SPILL LINE	SEWAGE	NORTH BECKLEY 2/23/00 18:15:00
		Comments : LIFT STATION HAS EQUIPMENT FAILURE.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY = NORTH BECKLEY** **TYPE = ALL**

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
22914 Sewage Spill	3/10/00 08:39:00	Raleigh	KIM DEAN SINCERELY YOURS	SLURRY	NORTH BECKLEY 3/10/00 04:00:00
		Comments :	SPILL SLURRY OUT OF SVR #2.		
22915 Sewage Spill	3/17/00 09:00:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 3/17/00 06:40:00
		Comments :	PROBLEM W/DIGESTOR DEVELOPED DUE TO CONSTRUCTION. HAD TO DUMP BACK TO PLANT. SETTLING CREATED A PROB		
22916 Sewage Spill	3/19/00 09:13:00	Raleigh	DALE BALLARD SINCERELY YOURS	SEWAGE	NORTH BECKLEY 3/19/00 07:30:00
		Comments :	BREAK IN LINE.		
23068 Sewage Spill	4/4/00 09:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 4/4/00 07:30:00
		Comments :	MANHOLES OVERFLOWING DUE TO RAIN.		
23069 Sewage Spill	4/17/00 13:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 4/17/00 07:30:00
		Comments :	MANHOLES OVERFLOWING DUE TO RAIN.		
23070 Sewage Spill	4/24/00 08:41:00	Raleigh	LARRY THOMPSON SINCERELY YOURS	SEWAGE	NORTH BECKLEY 4/24/00 08:00:00
		Comments :	PUMP STATION DOWN, BYPASSING.		
23071 Sewage Spill	4/25/00 10:00:00	Raleigh	LARRY THOMPSON SPILL LINE	SOLIDS	NORTH BECKLEY 4/25/00 10:00:00
		Comments :	MANHOLES OVERFLOWING DUE TO RAIN. MAIN PLANT TO CRANBERRY & VALUE CITY & SPRAGUE TO WHITESTICK CREEK		
23241 Sewage Spill	5/11/00 17:58:00	Raleigh	DALE BALLARD SINCERELY YOURS	WASTEWATER	NORTH BECKLEY 5/11/00 17:00:00
		Comments :	PUMP STATION OVERFLOWED @BECKLEY WEST APT.		

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh

COMPANY = NORTH BECKLEY

TYPE = ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
23396 Sewage Spill	6/7/00 16:27:00	Raleigh	KIM DEANE SINCERELY YOURS	SEWAGE	NORTH BECKLEY 6/7/00 14:30:00
		Comments : AIR RELEASE VALVE STUCK OPEN, 127 ELM ST.			
23397 Sewage Spill	6/8/00 12:51:00	Raleigh	LARRY THOMPSON SINCERELY YOURS	SEWAGE	NORTH BECKLEY 6/7/00 22:00:00
		Comments : MAINLINE HAD A STOPPAGE. OVERFLOWED MANHOLE.			
23398 Sewage Spill	6/22/00 08:56:00	Raleigh	KIM DEAN SINCERELY YOURS	SEWAGE	NORTH BECKLEY 6/22/00 08:30:00
		Comments : PLANT WASH OUT.			
23399 Sewage Spill	6/26/00 09:00:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 6/25/00 00:00:00
		Comments : ELECTRICAL FAILURE.			
23400 Sewage Spill	6/26/00 11:19:00	Raleigh	KIM DEAN SINCERELY YOURS	SEWAGE	NORTH BECKLEY 6/26/00 08:30:00
		Comments : CONTRACTOR ONSITE, REPAIR TO ULTRA VIOLET DISINFECTANT UNIT. WILL BE TURNED OFF.			
23590 Sewage Spill	7/14/00 08:01:00	Raleigh	KIM DEAN SINCERELY YOURS	SEWAGE	NORTH BECKLEY 7/13/00 00:00:00
		Comments : PUMP FAILURE AT LIFT STATION.			
23591 Sewage Spill	7/24/00 15:30:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 7/24/00 15:00:00
		Comments : HIGH WATER CAUSED PLANT EFFLUENT TO OVERFLOW.			
23775 Sewage Spill	8/8/00 17:14:00	Raleigh	DALE SINCERELY YOURS	SEWAGE	NORTH BECKLEY 8/8/00 16:30:00
		Comments : BYPASSING.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY = NORTH BECKLEY** **TYPE = ALL**

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
23776 Sewage Spill	8/10/00 10:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY [redacted] 8/9/00 11:30:00
		Comments : HIGH WATER CAUSED PLANT EFFLUENT TO OVERFLOW.			
23777 Sewage Spill	8/24/00 11:10:00	Raleigh	KIM DEAN SINCERELY YOURS	SOLIDS	NORTH BECKLEY [redacted] 8/24/00 23:59:00
		Comments : POSSIBLE SOLIDS SPILL.			
23918 Sewage Spill	9/2/00 21:28:00	Raleigh	DALE SINCERELY YOURS	SEWAGE	NORTH BECKLEY [redacted] 9/2/00 19:30:00
		Comments : WORKING BUT HIGH WATER.			
23919 Sewage Spill	9/2/00 21:28:00	Raleigh	DALE SINCERELY YOURS	SEWAGE	NORTH BECKLEY [redacted] 9/2/00 19:30:00
		Comments : WORKING, BUT HIGH WATER.			
23920 Sewage Spill	9/11/00 10:00:00	Raleigh	LARRY THOMPSON SPILL LINE	SOLIDS	NORTH BECKLEY [redacted] 9/11/00 10:00:00
		Comments : CONTRACTOR DUG INTO A LINE.			
23921 Sewage Spill	9/25/00 14:45:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY [redacted] 9/25/00 14:50:00
		Comments : HYDRAULIC OVERLOAD.			
23922 Sewage Spill	9/26/00 14:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY [redacted] 9/25/00 18:00:00
		Comments : BYPASSING DUE TO RAIN.			
24012 Sewage Spill	10/10/00 16:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY [redacted] 10/10/00 13:15:00
		Comments : BYPASS DUE TO RAIN.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY =** NORTH BECKLEY **TYPE =** ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
24013 Sewage Spill	10/19/00 10:17:00	Raleigh	KIM SINCERELY YOURS **Comments :** DOH CUT LINE.	SEWAGE	NORTH BECKLEY 10/19/00 09:10:00
24014 Sewage Spill	10/21/00 08:12:00	Raleigh	DALE BALLARD SINCERELY YOURS **Comments :** PUMP STATION STOPPED.	SEWAGE	NORTH BECKLEY 10/21/00 06:45:00
24015 Sewage Spill	10/26/00 10:00:00	Raleigh	DALE SPILL LINE **Comments :** STOPPAGE IN LINE.	SOLIDS	NORTH BECKLEY 10/26/00 08:30:00
24107 Sewage Spill	11/28/00 10:00:00	Raleigh	DALE SPILL LINE **Comments :** MANHOLE STOPPAGE.	SEWAGE	NORTH BECKLEY 11/28/00 09:00:00
24186 Sewage Spill	12/2/00 08:40:00	Raleigh	HARRISON SINCERELY YOURS **Comments :** PUMP STATION STOPPED UP WITH RAGS.	SEWAGE	NORTH BECKLEY 12/2/00 07:00:00
24187 Sewage Spill	12/20/00 14:18:00	Raleigh	KIM SINCERELY YOURS **Comments :** BYPASSING.	SEWAGE	NORTH BECKLEY 12/17/00 10:30:00
24188 Sewage Spill	12/17/00 11:22:00	Raleigh	KIM SINCERELY YOURS **Comments :** BYPASSING DUE TO HEAVY RAIN.	SEWAGE	NORTH BECKLEY 12/17/00 06:23:00
24189 Sewage Spill	12/17/00 11:22:00	Raleigh	KIM SINCERELY YOURS **Comments :** BYPASSING DUE TO HEAVY RAINS.	SEWAGE	NORTH BECKLEY 12/17/00 10:30:00

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh

COMPANY = NORTH BECKLEY

TYPE = ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
24190 Sewage Spill	12/19/00 16:43:00	Raleigh	DALE / SINCERELY YOURS	SEWAGE	NORTH BECKLEY 12/19/00 14:30:00
		Comments : MANHOLE OVERFLOW.			
24303 Sewage Spill	1/11/01 15:00:00	Raleigh	KIM DEAN / SPILL LINE	SOLIDS	NORTH BECKLEY 1/11/01 10:00:00
		Comments : MANHOLE STOPPAGE.			
24304 Sewage Spill	1/22/01 10:00:00	Raleigh	LARRY THOMPSON / SPILL LINE	SOLIDS	NORTH BECKLEY 1/22/01 09:30:00
		Comments : PUMP STATION HAS ELECTRICAL PROBLEM.			
24309 Sewage Spill	1/16/01 09:00:00	Raleigh	KIM DEAN / SPILL LINE	SOLIDS	NORTH BECKLEY 1/16/01 07:00:00
		Comments : MANHOLE STOPPAGE AT 134 CANTERBURY DRIVE. STOPPED.			
24310 Sewage Spill	1/16/01 09:00:00	Raleigh	KIM DEAN / SPILL LINE	SOLIDS	NORTH BECKLEY 1/16/01 07:00:00
		Comments : MECHANICAL FAILURE @TREATMENT PLANT.			
24311 Sewage Spill	1/19/01 07:42:00	Raleigh	KIM DEAN / SINCERELY YOURS	SEWAGE	NORTH BECKLEY 1/19/01 06:47:00
		Comments : OVERFLOW TO PUMP STATION DUE TO HEAVY RAIN.			
24312 Sewage Spill	1/19/01 09:00:00	Raleigh	KIM DEAN / SPILL LINE	SEWAGE	NORTH BECKLEY 1/19/01 08:30:00
		Comments : DISCHARGING DUE TO HIGH FLOW.			
24442 Sewage Spill	2/16/01 16:38:00	Raleigh	KIM DEANE / SINCERELY YOURS	SEWAGE	NORTH BECKLEY 2/16/01 00:00:00
		Comments : RAIN CAUSING HIGH FLOWS ABOVE CAPACITY.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh

COMPANY = NORTH BECKLEY

TYPE = ALL

Id Number / Incident Type	County / Recorded By	Caller / Material	Company Name / Date of Spill
24573 3/9/01 13:00:00 Sewage Spill	Raleigh SPILL LINE	DALE SOLIDS	NORTH BECKLEY 3/9/01 12:30:00
	Comments : MANHOLE BACKED UP.		
24728 4/24/01 13:00:00 Sewage Spill	Raleigh SPILL LINE	DALE SOLIDS	NORTH BECKLEY 4/24/01 08:30:00
	Comments : PUMP STOPPED UP.		
24729 4/30/01 10:00:00 Sewage Spill	Raleigh SPILL LINE	KIM DEAN SOLIDS	NORTH BECKLEY 4/29/01 00:00:00
	Comments : FLOATS STUCK, CAUSING WET WELL TO OVERFLOW.		
24933 5/17/01 09:00:00 Sewage Spill	Raleigh SPILL LINE	KIM DEAN SEWAGE	NORTH BECKLEY 5/17/01 02:11:00
	Comments : BYPASSING DUE TO RAIN AND PUMP FAILURE.		
24934 5/17/01 09:00:00 Sewage Spill	Raleigh SPILL INE	KIM DEAN SOLIDS	NORTH BECKLEY 5/17/01 02:40:00
	Comments : OVERFLOWING DUE TO RAIN; SOLIDS DISCHARGING.		
24935 5/18/01 09:21:00 Sewage Spill	Raleigh SINCERELY YOURS	KIM DEAN SEWAGE	NORTH BECKLEY 5/18/01 05:30:00
	Comments : BYPASSING.		
24936 5/18/01 09:21:00 Sewage Spill	Raleigh SINCERELY YOURS	KIM DEAN SEWAGE	NORTH BECKLEY 5/18/01 07:00:00
	Comments : BYPASSING.		
24937 5/22/01 11:00:00 Sewage Spill	Raleigh SPILL LINE	KIM DEAN SOLIDS	NORTH BECKLEY 5/22/01 11:00:00
	Comments : HIGH FLOW CAUSING OCCASIONAL DISCHARGES FROM EFFLUENT.		

Comments : BYPASSING DUE TO RAIN.

24939 5/22/01 10:00:00 Raleigh KIM DEAN NORTH BECKLEY
Sewage Spill SPILL LINE SOLIDS 5/21/01 00:00:00
Comments : BYPASSING

24940 5/22/01 10:00:00 Raleigh KIM DEAN NORTH BECKLEY
Sewage Spill SPILL LINE SOLIDS 5/21/01 00:00:00
Comments : OVERFLOWING.

24941 5/22/01 10:00:00 Raleigh KIM DEAN NORTH BECKLEY
Sewage Spill SPILL LINE SOLIDS 5/21/01 08:30:00
Comments : BYPASSING.

24942 5/25/01 11:27:00 Raleigh KIM DEAN NORTH BECKLEY
Sewage Spill SINCERELY YOURS SEWAGE 5/25/01 00:00:00
Comments : OVERFLOW.

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From : "Pio Lombardo" <pio@lombardoassociates.com>
To : "Randy Boyd" <ranboyd@hotmail.com>
Subject : RE: proposed WQ stds
Date : Wed, 18 Jun 2003 01:11:04 -0400
Attachment : 030616FecalcolidataKenneyCreek.xls (24k)

Reply | Reply All | Forward | Delete | Put in Folder... | Printer Friendly Version

Randy

A major issue with the change is that it will take away much of the basis for reducing bacterial pollution. You may wish to use the Winona Kenney Creek data that illustrates the change of fecal coliform with rain. Dry weather testing could easily miss the contamination that is moving downstream.

Pio

-----Original Message-----
From: Randy Boyd [mailto:ranboyd@hotmail.com]
Sent: Tuesday, June 17, 2003 9:15 AM
To: pio@lombardoassociates.com
Subject: Fwd: proposed WQ stds

Pio,
Thank you. Here are the proposed changes.I am testifying at the public hearing this wednesday at 7pm. I would prefer that I had at least an e-mail copy of your comments by then but realize this is very short notice and that it is gracious of you to agree to help us on this issue .IF YOU CAN WRITE A SHORT E-MAIL FOR WED.PRESENTATION FOLLOWED BY A FORMAL LETTER I WOULD APPRECIATE IT.

>From: Jesse_Purvis@nps.gov
>To: ranboyd@hotmail.com
>Subject: proposed WQ stds
>Date: Tue, 17 Jun 2003 09:04:10 -0400
>
>Randy,
>
>attached
>
>Jesse
>
>(See attached file: 2003FiledProposedRule.pdf)(See attached file:
>AppendixEcomparison20022003.pdf)

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The Board has heard on many occasions our industry's concerns regarding the competitiveness of our product with other producers in this country and abroad. Everyone produces what is essentially the same product. The result is that the decision on where to purchase one's coal comes down to price. Many factors influence the price of West Virginia coal and its competitiveness with other producers. Many, such as transportation, geology and labor costs are beyond any possible influence by this Board.

The cost of complying with environmental regulations is an area where the Board can make a difference. Environmental compliance is a significant business cost in our industry and we firmly believe that those costs are already higher in West Virginia. That means that this state's coal industry is at some risk. The Board should consider the equity of our regulations with those of surrounding states. This is particularly true for turbidity, which as you will see later, is not the parameter of concern. The ability of an individual citizen to have a positive influence on our state's economy is a rare thing indeed. The Board members, in keeping the exemption for the turbidity standard in place, will be helping to keep economic development alive in the parts of our state that need it most, Southern West Virginia. This can be done at no real cost to water quality in our state.

Comment 2: West Virginia regulations already contain narrative criteria that can be used by inspectors to address the excessive discharge of solids

The current and proposed Water Quality Standards already contain narrative criteria to address the excessive discharge of solids. Section 3 of the regulation specifically prohibits the presence of sewage, industrial wastes or other wastes that cause or materially contribute to the following conditions, "distinctly visible floating or settleable solids, suspended solids...deposits or sludge banks on the bottom...materials which are harmful, hazardous or toxic to man, animal or aquatic life...distinctly visible color..."

This section of the regulation is more than sufficient to provide agency inspectors with the necessary tools to address the excessive discharge of solids or turbidity-causing substances. Removal of the exemption and application of the turbidity standard would be redundant.

Comment 3: Turbidity is not a pollutant

Turbidity is not a pollutant. Turbidity is a qualitative measure of the optical property of water that causes light to be scattered and absorbed rather than transmitted. Surface water turbidity can be caused by suspended and colloidal matter such as clay, silt, finely divided organic and inorganic matter, color-inducing substances like tannins from leaf litter, and plankton and other microscopic organisms.

The health and environmental impacts that are often attributed to turbidity are actually directly due to suspended solids and colloidal matter in the water column. The turbidity-labeled health concerns in raw water used for drinking water supplies are actually due to the presence of suspended organic and inorganic materials that provide a haven for microbes; shielding them from disinfection. The problem in recreational contact waters is actually high concentrations of suspended solids that obscure underwater hazards or harbor high concentrations of pathogens; not turbidity. Turbidity is not responsible for gill clogging and abrasion in fish – suspended solids are. Declines in fish reproduction through egg and fry mortality are not caused by turbidity; they are caused by siltation. Benthic macroinvertebrates are suffocated or starved by solids that settle on the stream bottom, not by turbidity.

Turbidity is not the cause of these harmful effects; it is only the surrogate used to indicate the presence of the real stressors to the aquatic environment– organic and inorganic suspended solids. Turbidity has historically been used as a water quality standard and indicator of suspended solid concentrations, at least in part, due to the ease and cost of using a nephelometric turbidity meter in the field in comparison to the direct measurement of suspended solids. There are better, readily available analytical methods that can detect and quantify solids in water.

Comment 4: Coal operations are subject to engineering controls and permit limits for the control of solids

Coal mining activities, inclusive of the earth-disturbing activities, are subject to National Pollutant Discharge Elimination System (NPDES) permits. These permits require the submission of detailed engineering plans, certified by a licensed Professional Engineer, showing compliance with engineering controls and best management practices designed to minimize the discharge of solids. For every acre of earth-disturbing activity, coal-mining operations must provide a sediment retention structure with a storage capacity of approximately 5,400 cubic feet, significantly larger than what is merely suggested for other earth-disturbing activities. Coal permit regulations also require that these structures be routinely examined and that built-up solids are removed on a regular basis.

Discharges are subject to mandatory monitoring and reporting. Every two weeks, the discharge from the outfalls at coal mining operations must be sampled and analyzed for a variety of parameters to demonstrate compliance with specific permit limits. One of the permit limits is for total suspended solids. Total suspended solids analysis is a direct measure of the amount of solids present on a filter through which a known volume of water has been passed. Unlike turbidity, this is a quantifiable measure and is expressed in terms of milligrams of solids per liter of water. The daily maximum permit limit is 70 milligrams of solids per 1 liter of water.

Discharges due to a precipitation event, when additional solids are likely to be agitated into the water column, are subject to a settleable solids permit limit. Settleable solids analysis is a measure of the amount of solids that will settle out of a water sample in a 60-minute period. This is also a quantifiable measure and is expressed in milliliters of solids per liter of water. The permit limit is 0.5 milliliters of solids per 1 liter of water.

Department of Environmental Protection (DEP) inspectors visit coal mining operations on a routine basis, typically at least once a month, to ensure that these operations are in compliance with the regulatory and permit requirements. Additionally, all discharge monitoring results must also be submitted to the DEP on a monthly basis. Violations of the sediment control requirements or permit discharge limits can include monetary penalties and the possibility of the enforced shutdown of the operation until the source of the violation is stopped. Unlike other earth-disturbing activities, the requirements to control solids at coal operations are not suggestions and they are not voluntary or optional.

Comment 5: West Virginia's turbidity criterion is outdated and meaningless

The United Stated Environmental Protection Agency (EPA) developed the current federal water quality criterion recommendation for turbidity nearly thirty years ago. It was published in EPA's *Quality Criteria for Water* (1976) and has never been updated. In the EPA document, the criterion is grouped with those for suspended and settleable solids and reads as follows:

Solids (Suspended, Settleable) and Turbidity

> Settleable and suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm to aquatic life.

The light compensation point is the light intensity at which net photosynthesis is zero; that level at which a plant's energy absorption through photosynthesis is matched by the energy costs of respiration. A review of the Environmental Quality Board's (EQB) files associated with the initial adoption of the turbidity criterion in the 1980 revision to the Water Quality Standards was conducted. This review did not produce any documents showing how the West Virginia criterion was developed or what methods, if any, were used to determine the seasonally established norm for the light compensation point in our streams. The current criterion is essentially meaningless.

One addition important point is that the file review did not contain evidence that the criterion was ever reviewed or approved by the EPA.

In the 1980, *Rationale for Revision of Water Quality Standards*, the EQB addressed comments relating to the exclusions to the turbidity criterion as follows:

> Several commenters objected to the exclusion for Best Management Practices, contending that these activities should have no problem in meeting the turbidity criterion. The Board did not accept these comments since it believes that the exclusions encourage participation in and provide an incentive for voluntary compliance with the 208 program. A language change was made to clarify the participant's responsibilities. The same rationale applies to the rejection of a comment asking that no exclusion be allowed for sources covered by Federal or State surface mining permits.

With regard to a comment requesting criteria for settleable solids and total suspended solids, the rationale document states:

> The comment requesting criteria for settleable solids and total suspended solids was rejected. In the development of these criteria, laboratory tests showed a highly significant correlation between settleable solids and NTU. Therefore, separate criteria were not considered necessary.

However, current published information on the subject is replete with data showing that turbidity cannot consistently be correlated with solids concentrations due to the effects of size, shape, and refractive index of the particles in the sample.

In an abstract from a presentation for a turbidity workshop held in Reno Nevada in 2002, William Swietlik, Program Manager for the EPA's Biocriteria Program states that, "In lieu of useful criteria for turbidity, suspended solids and bedded sediments…the States and Tribes are using a variety of approaches to manage these pollutants." The key point in this statement is that EPA believes that the current turbidity criterion is not useful and is in need of revision.

The evaluation of possible criteria initiatives for excessive sedimentation, flow alterations and wildlife is one of the top priorities for the EPA's Criteria and Standards Program. They are currently in the process of preparing a summary of the current state of the science on turbidity, suspended solids and bedded sediments in surface waters. This initial body of information is scheduled to be published in the Federal Register in August 2003. This is the critical first step in arriving at criteria that will be meaningful and useful in addressing the problems associated with solids in streams. West Virginia's standard should not be altered until there is a sound scientific basis for the turbidity criterion.

This criterion was originally implemented in West Virginia as a tool to encourage earth-disturbing activities to utilize the best practical technologies available to control erosion and sedimentation. The impractical nature of the turbidity criterion, which requires a comparison of a discharge's impact to the existing turbidity in the receiving stream at a specific point in time, demonstrates that it was never intended to be implemented through a discharge permit program. Specific numeric limits could not be placed in a permit utilizing this criterion.

Removing the exemption to the numeric criterion for turbidity that is currently in place for activities where an approved Federal or State Surface Mining permit is in effect will reverse almost 30 years of public policy in this state. Further, removal of the exemption will not add any measurable environmental protection or benefit. We do not feel that this is an action that should be undertaken in haste, or without careful consideration of the science and the potential consequences.

We appreciate this opportunity to provide these comments.

Respectfully Submitted,

Jason D. Bostic
Regulatory Affairs Specialist

AQBEQB CLERK - MWQA Comments on the Triennial Review of WQS

From: "Paul Calamita" <Paul@aqualaw.com>
To: "Melissa Carte" <clerk@aqbeqb.state.wv.us>
Date: 6/23/2003 4:37 PM
Subject: MWQA Comments on the Triennial Review of WQS
CC: "Libby Chatfield" <lchatfield@aqbeqb.state.wv.us>, "David Sago" <davidsago@aol.com>, "Timothy P. Stranko" <tstranko@mub.org>, "Kathleen Rushworth" <krushworth@csbwv.com>, "A. King Campbell" <fit4ak@aol.com>, "Stephen Knipe" <s_knipe@email.msn.com>, "Ronald Dodson" <rdodson004@aol.com>, "Michael Saffel" <mesaffel@inetone.net>, "Daniel E. Ferrell" <dan.ferrell@bridgeportwv.com>

I hope you are doing well.

Attached are the comments of the West Virginia Municipal Water Quality Association on the pending triennial review of the WQS Regulation. Please let me know if you have any questions or should you require additional information about these comments.

Thank you.

Paul Calamita
General Counsel
MWQA

Comments of the West Virginia Municipal Water Quality Association
On the Triennial Review of Water Quality Standards

June 23, 2003

We have reviewed the proposed Triennial Review of the Water Quality Standards Regulation and have the following comments:

Design Flows: We support the use of EPA's recommended design flows. They have been used nationwide, including by most surrounding states, for several decades.

Thus, we recommend changing to the use of the 1Q10 to implement acute water quality standards and the Harmonic Mean Flow for applying human health criteria (carcinogens).

We understand the political debate around the use of the harmonic mean flow, but as a science-based organization, cannot let the issue pass without comment. Changing to the harmonic mean flow (and 1Q10) is not only appropriate, it is the only technically defensible action. Contrary to the political rhetoric, use of the harmonic mean flow will not result in significant increases in chemicals discharged to our waters. The antidegradation and antibacksliding programs will prevent any substantial increases in discharges regardless of what the standards may become.

The harmonic mean flow is protective to a level of one-in-a-million additional cancers over a 70-year life exposure at the full pollutant level of the standard. As a society, West Virginians accept risks many orders of magnitude higher without any controversy. Setting speed limits as 70 miles per hour, allowing youthful as well as older drivers the privilege of driving, setting the drinking age, allowing smoking, the possession of hand guns, eating fast food, allowing people to walk outside during storms (lightening strikes), etc. To draw a line at human health water quality criteria for protection well in excess of one-in-a-million makes no sense – especially given the other safeguards that will prevent any meaningful change in discharge levels from existing (antidegradation, antibacksliding) and future facilities (new source performance standards).

Put another way, it is like setting the speed limit on one 10-mile stretch of Interstate 79 at 25 miles an hour in the name of safety (1 death per year as opposed to 3 deaths per year at 70 miles-per-hour) while there is absolutely no difference between those 10 miles and the rest of the road – which is regulated at 70 mph. It is illogical. Such arbitrary decision-making unnecessarily chills interstate confidence in the governance of West Virginia.

Thus, we think a decision not to adopt the harmonic mean is technically indefensible and completely out of step with the realities of the risks levels that we routinely accept and impose across society in our every day lives.

That said, to the extent the Board does follow our recommendation and adopt the EPA-recommended standards, we are concerned about the change from using the 7Q10 to

the 1Q10 to implement acute water quality standards. This may result in additional effluent limits as well as limits at lower levels for many dischargers to smaller streams around the State. If this turns out to be the case, it will be important for both the EQB and the DEP to provide adequate time and technical assistance to affected local governments to assess site-specific as well as other affordable compliance options. In particular, DEP should work with such dischargers well in advance of permit reissuance to ensure a proper mixing zone determination can be conducted.

Mixing Zones (46-1-5)

5.2.b regarding Zones of Initial Dilution.

We believe EPA's options in the Technical Support Document for establishing ZIDs are arbitrary and too restrictive. Accordingly, they should be advisory only. This will allow the Director the discretion to establish more reasonable ZIDs as appropriate – especially for small dischargers as well as dischargers to small streams.

By way of example of the restrictiveness of the TSD approach, the option for high velocity discharges (> 3 meters per second) requires that the acute criterion should be met within 50 times the discharge length scale (50 times square root of the pipe diameter). The scientific basis for this alternative is that these conditions will ensure that the acute criterion is met within a few minutes under practically all conditions. Acute criteria are designed to be protective for one-hour exposures, so this alternate should be protective of drifting organisms.

However, there does not appear to be any scientific basis for this provision. The acute water quality standards are protective for a one-hour exposure. Therefore, there is no reason to try to limit the acute mixing zone to just "a few minutes." We are concerned that this provision results in unduly stringent mixing zones for small discharges that pose little potential for any water quality impacts. For example a discharge from a 72 inch pipe would have a mixing zone of approximately 123 feet while a discharge from a 4 inch pipe would only get a mixing zone of 29 feet. Finally, smaller dischargers are likely to be more heavily impacted by the compliance costs.

Another example is the option that would limit a ZID to 5 times the local water depth in any horizontal direction. The basis for this requirement is to ensure that mixing zones are not established in shallow, near-shore waters. This criterion has unnecessarily precluded discharges in near-shore waters.

Based on the foregoing, we propose that instead of specifying that a ZID "shall be determined using alternatives 2 through 4 outlined in Section 4.3.3 of US EPA's Technical Support Document...." we believe Section 5.2.b should be revised to say that a ZID "may be determined using alternatives 2 through 4 ....."

Category A: Section 6.2

We remain opposed to the designation of all waters as being suitable for public water supply. As we have written previously, we believe such an approach is unnecessary and reckless from a public health perspective. Moreover, it is technically indefensible in this day and age to even suggest such a sweeping statewide designation in the face of monitoring data about natural conditions that would preclude public consumption of

untreated surface waters across the State. Accordingly, we remain opposed to the proposed removal of the list of Category A waters provided in Appendix B and the application of Category A statewide.

Category C: Water Contact Recreation; Section 6.4

We urge the Board to adopt several categories of water contact recreation, ranging from primary contact to secondary contact to uses such as boating. This will allow the Board to apply more appropriate subclasses of the water contact use during appropriate periods (seasonally) as well as when surface waters are influenced by wet weather and other conditions (high flow) that make all types of contact recreation inadvisable.

Appendix E (Table 1).

We object to the presentation of Table 1 in this proposal. It could not have been made more difficult for the public to understand the proposed changes. Instead of showing NEW and DELETED text, everything is indicated as "NEW" text. The Board should require the staff to republish Table 1 showing the new and deleted text for another 30 days of public comment. The public should not have to perform a side-by-side comparison of more than 150 water quality criteria in order to understand what the Board proposes to do with the Water Quality Standards regulation. This approach hindered the public's ability to provide meaningful comments and imposed an unnecessary burden (time and effort) on commenters to glean where the changes are.

Finally, we are very concerned over the statement in the proposal that the Board has only looked to update its water quality standards where the existing standards are less stringent than an updated standard by EPA. We believe the Board should update all of the standards using the best information available to the Board. Other programs (antidegradation and antibacksliding) serve to minimize the effect of any standards updated to be less stringent. We do not believe the Board was charged to apply good science only when it will lead to more stringent requirements. The standards should all be based on the best science. The Board and DEP have many other tools at their disposal to address the implementation of those standards.

We are appalled that the Board would ignore updates to the standards given that the standards are the building blocks for so much of the Clean Water Act. For example, where standards would be raised, impaired water determination might be avoided, thereby avoiding the misallocation of agency as well as regulated community resources.

We believe that the Board should also direct the staff to identify any standards that should be made less stringent as part of a supplemental public notice on this triennial review.

Finally, as part of the Board's response to these comments, we specifically request to know whether the Board's staff or the Board itself made the decision to only seek to update standards that will be more stringent as opposed to all of the standards.

Updating Bacteria Standards.

We support the proposal for fecal coliform (Parameter 76a) to allow an alternative compliance determination to be made using EPA's proposed e.coli standards. However,

we object to the provision in footnote "e" that would require "evenly" spaced samples over the course of a month. This is unnecessary and should be removed or, alternatively, revised to say "reasonably" spaced samples as currently required NPDES bacteria monitoring is unlikely to be "evenly" spaced over a month.

Furthermore, we note that EPA's May, 2002 guidance on implementing the new criteria includes the following statement in Section 5.2.2:

"EPA recommends, but would not require, that states and authorized tribes use only the geometric mean component for NPDES water quality-based effluent limits."

Accordingly, we ask that the Board clarify in footnote "e" that only the monthly geometric mean for e. coli should be used for water quality standards compliance purposes.

Finally, the term, "one sided confidence limit" in footnote "e." should be clarified. The following excerpt from EPA guidance clarifies the issue:

"When the criteria were published in 1986, they were based upon specified illness rates for fresh and marine recreational waters. Specific single sample maximum values were derived using percentiles (referred to as "confidence levels" in the criteria document) associated with the geometric mean and observed standard deviation and were given descriptive headings based on the suggested application of the maximum values to varying use intensities."

The Board is urged to use this same terminology. The percents listed in footnote "e" of the current triennial review document should be identified as upper percentiles and not confidence limits.

Wet Weather Designated Use and Water Quality Standards.

We applaud the Board for its commitment to evaluate appropriate wet weather use and water quality standards on a parallel track to this rulemaking. Developing meaningful wet weather uses and standards is one of the most significant remaining water quality challenges statewide. This is particularly the case for our State given the topography and the resulting wet weather impacts to our rivers. We look forward to the opportunity to work with the Board and its staff on this important initiative and look forward to developing a more concrete approach for consideration in a future water quality standards rulemaking.

End.

Environmental Engineers/Consultants
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June 23, 2003

Mr. Ed Snyder, Chair
Environmental Quality Board
1615 Washington St., East, Suite 301
Charleston, WV 25311-2126

Dear Mr. Snyder: Re: Proposed Fecal Coliform Water Quality Standard

Lombardo Associates, Inc. (LAI) is an environmental engineering and consulting firm that has worked in the West Virginia Counties of Fayette, Monongalia and Berkeley as well as for West Virginia University and the Small Flows Clearinghouse during the past 20 years. LAI specializes in decentralized and small community wastewater management issues that are most applicable to West Virginia communities. LAI has been the Engineer of Record for over $200 million of decentralized wastewater systems and has received the American Consulting Engineers Council (ACEC) Engineering Excellence Award for our innovative decentralized wastewater projects. Also, I was named a Construction Man of the Year Candidate by *Engineering News Record* for our wastewater projects. LAI has performed extensive water quality studies and I am the author of the first version of the widely used and EPA supported HSPF water quality model, which I believe is used by the WV DEP.

Lombardo Associates, Inc. is currently working in Fayette County addressing wastewater management issues that are causing bacterial water quality violations that threaten the County's economically vital water contact recreational industry. We are aware of the serious combined sewer overflow (CSO) and direct discharge of untreated wastewater issues in Fayette County and their impact on bacterial water quality standards violations and the resulting public health risks.

We respectfully recommend that the proposed changes to the Fecal Coliform criteria in Appendix E, Water Quality Criteria, 76.a Fecal Coliform that allow for further testing for Escheria Coli when noncompliance of the Fecal Coliform Standard occurs be withdrawn for the following reasons:

1. The wording of the proposed change could be misinterpreted to allow re-sampling. It should be explicitly stated that re-sampling is not allowed as that would encourage the approach of sampling until a non-violation occurs.

2. The practicality of sample holding times and preservation makes the option of further testing for e. coli not implementable. According to the EPA approved Standard Methods for the Examination of Water and Wastewater, fecal coliform results would not be known for at least 24 + hours and e. coli must be analyzed for within 8 hours of sample collection.

The EQB may wish to amend the propose change to provide for a transition period from the fecal coliform standard to the EPA recommended e. coli standard. A transition period would allow correlations to be developed.

The criticality of a strong bacterial water quality standard cannot be understated for protection of public health and the economic interests of Fayette County. Maintenance of bacterial water quality standards is a primary basis for needed wastewater system improvements. The loss of a strong standard, comparable to other States and EPA guidance, would place in jeopardy funding for municipal wastewater projects, as well as compromise public health protection.

Thank you for the opportunity to present comments on this critical issue.

Yours truly,

Pio S. Lombardo, P.E.
President

June 17, 2003

To: West Virginia Environmental Quality Board
1615 Washington East Street, Suite 301
Charleston,WV 25311-2126

From: Randy Boyd, Plateau Action Network
P.O. Box 482
Fayetteville,WV 25840

Re: REVIEW OF WATER STANDARDS RULE: COMMENTS RELATED TO NEWLY PROPOSED FECAL COLIFORM STANDARDS

Dear Board :

The Plateau Action Network (PAN), a nonprofit citizens group located in Fayette County dedicated to sustainable economic development and environmental management urges the board to reconsider proposed changes to the fecal coliform criteria for contact recreation .PAN is also part of the Fayette County Water Quality Coalition (FCWCQ). The FCWQC is a group of ,local government officials ,health care providers environmental groups ,citizens and business leaders including the West Virginia Professional River Out fitters (WVPRO). The FQWC understands the importance of wastewater infrastructure to the health of it's economy and clean water to the health of it's residents and the tourist industry. The FCWQC with PAN'S support in the last year has received a 400,000 dollar direct appropriation from Congress, to develop a county wide comprehensive wastewater treatment plan, along with two million dollars worth of wastewater infrastructure improvements through the Corps of Engineers. PAN appreciates the opportunity to comment on these changes, however we strongly oppose these changes for the following reasons :

1. The proposed changes read that if sampling indicates a violation of the fecal coliform standard, additional tests for E. coli should be run for that sample to be considered to be a violation.This second E. coli test would have to exceed the EPA recommended standard for E. coli. The problem is that by the time the results from the first fecal coliform tests return from the laboratory, which can be up to several days, the conditions that produced the high fecal coliform counts may no longer be present . Thus when the second sample is taken E. coli counts may be low, but do not reflect conditions and circumstances of the original fecal coliform violation. In essence this gives samplers two opportunities to avoid a violation and boils down to the basic laws of probability.

2. Included you will find documentation of over 60 bypasses of untreated sewage due to rainfall events on Piney Creek in Raleigh County. According to a WV DEP employee "the city of Beckley alone bypasses literally hundreds of millions of gallons of raw sewage into Piney Creek each year." These by- passes are episodic and may last anywhere from several hours to usually no longer than a day. The National Park Service has documented extremely high fecal counts and E. coli in this stream during rainfall

events corresponding to these bypasses. Under the existing fecal standard you would expect that a random sample would yield a one out of six chance of catching these bypass plumes and their corresponding high levels of fecal coliform. This is based on 60 bypasses a year and 365 days in a year. Under the proposed standard the simple laws of probability greatly increase the odds that bacterial violations as a result of bypasses will be documented. By requiring a second test to establish a violation, the odds of catching a bypass plume and the corresponding high bacterial levels increase to 1 out of 36, a significant increase from the theoretical probability of 1 out of 6 under the current standard.(DURING THE FIRST TEST THE ODDS OF CATCHING THE PLUME ARE ONE OUT OF SIX . DURING THE SECOND TEST THE ODDS OF CATCHING THIS PLUME ARE ALSO ONE OUT OF SIX. HOWEVER THE ODDS OF CATCHING THAT PLUME IN TWO TESTS IN A ROW AND THUS RECORDING THAT SPECIFIC VIOLATION ARE 1/6 TIMES 1/6 OR ONE OUT OF THIRTY-SIX.)

3.As a result of these new standards it will be difficult to prove all but chronic violations . Therefore the impression will be that water quality has greatly improved when it has not .Ergo there will be no incentive to improve water quality through funding wastewater improvement projects to correct combined sewer over overflows since the water quality appears to be "good." The state's two billion dollar estimate needed to bring adequate sewage to it's residents has just been considerably decreased, not by a real improvement in water quality and sewage treatment, but by a test that uses smoke and mirrors to deceive it's citizens and the hundreds of thousands of tourists that visit our state about the possible public health consequences of recreating in our waters.

4. Under the current proposal , recreational boating is defined as sail boating and motor boats. It is well documented that literally hundreds of thousands of people a year canoe ,kayak ,and raft, our waters. These forms of recreational boating provide a greater opportunity for exposure and ingestion of pathogens from polluted waters than does motor boating .Certainly there are a limited number of opportunities to sail boat in West Virginia. We ask the board to include kayaking, canoeing, and rafting in the definition of boating.

5.Again this new proposal as written will negatively impact the ability to fund projects .I have included an e-mail correspondence from Pio Lombardo , President of Lombardo Associates Inc.(LAI) . Mr. Lombardo a wastewater engineer whose work has received national acclaim states " a major issue with the change is that it will take away much of the basis for reducing bacterial pollution." Mr. Lombardo has worked before in WV and is currently engineering a decentralized wastewater project for Fayette County. Mr. Lombardo plans to submit written comments.

6. There seems to be the notion that requiring split samples from the same location, same time for E. coli and fecal coliform is prohibitive or impractical. Doing this would be the most accurate way of characterizing the health risks while transitioning from the fecal standard .This is our recommendation. Fecal coliform tests are around $20 per sample and according to Jesse Purvis, NPS, PhD. Aquatic Biologist E. coli tests are not much more expensive.

In summary ,please reject these new fecal coliform standards and promulgate a rule that is fair .We recommend you explore a transition period of five years .Another idea would be to explore a transition period in which split samples were taken for both fecal coliform and E.coli during rainfall events . Then anaylize that data to see if there was a strong correlation between fecal coliform violations and E.coli violations ,and if so perhaps the fecal test could continue to be used . The NPS has done this and established a strong correlation between the two.

Sincerely ,

Randy Boyd ,
Plateau Action Network

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY = SHADY SPRINGS** **TYPE = ALL**

Id Number / Entry Date / Incident Type	County / Caller / Recorded By	Material	Company Name / Date of Spill
22546 1/10/00 11:00:00 Sewage Spill	Raleigh RUDY ARTHUR SPILL LINE **Comments :** FLOAT BROKEN.	SEWAGE	SHADY SPRINGS 1/10/00 09:00:00
22547 1/12/00 11:30:00 Sewage Spill	Raleigh JERRY SPILL LINE **Comments :** POWER OUTAGE.	SEWAGE	SHADY SPRINGS 1/12/00 11:00:00
22783 2/14/00 09:30:00 Sewage Spill	Raleigh RUDY ARTHUR SPILL LINE **Comments :** PLANT WASHOUT.	SEWAGE	SHADY SPRINGS 2/14/00 00:00:00
22784 2/14/00 09:11:00 Sewage Spill	Raleigh RUDY ARTHUR SINCERELY YOURS **Comments :** OVERFLOW.	SEWAGE	SHADY SPRINGS 2/14/00 08:00:00

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh COMPANY = BECKLEY TYPE = ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
22454 Sewage Spill	1/4/00 15:00:00	Raleigh	BILL GAINER SPILL LINE	SEWAGE	BECKLEY 1/4/00 08:40:00
		Comments :	BROKEN FORCE MAIN.		
22455 Sewage Spill	1/12/00 08:06:00	Raleigh	DON BUCKLAND SINCERELY YOURS	SEWAGE	BECKLEY 1/11/00 00:00:00
		Comments :	FOAM OVERFLOW DIGESTER LID. LESS THAN 15 GALLONS.		
22456 Sewage Spill	1/19/00 15:00:00	Raleigh	BILL GAINER SPILL LINE	SEWAGE	BECKLEY 1/19/00 13:00:00
		Comments :	CONTRACTOR BROKE FORCE MAIN.		
22457 Sewage Spill	1/20/00 15:02:00	Raleigh	MARK MORGAN SINCERELY YOURS	SEWAGE	BECKLEY 1/20/00 14:40:00
		Comments :	SPILL. NO OTHER INFORMATION GIVEN ON FORM.		
22590 Sewage Spill	2/14/00 10:00:00	Raleigh	DON BUCKLAND SPILL LINE	SEWAGE	BECKLEY 2/14/00 03:00:00
		Comments :	A DEAD LINE.		
22591 Sewage Spill	2/14/00 13:00:00	Raleigh	BILL GAINER SPILL LINE	SEWAGE	BECKLEY 2/14/00 12:15:00
		Comments :	BREAK IN FORCE MAIN.		
22592 Sewage Spill	2/14/00 10:00:00	Raleigh	DON BUCKLAND SPILL LINE	SEWAGE	BECKLEY 2/14/00 03:00:00
		Comments :	A DEAD LINE.		
22593 Sewage Spill	2/21/00 15:52:00	Raleigh	KEN RICHMOND SINCERELY YOURS	SEWAGE	BECKLEY 2/21/00 15:30:00
		Comments :	SEWAGE SPILL.		

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh COMPANY = BECKLEY TYPE = ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
22594 Sewage Spill	2/22/00 17:25:00	Raleigh	BILL GAINER SINCERELY YOURS	SEWAGE	BECKLEY 2/22/00 08:20:00
		Comments : BREAK IN FORCE MAIN, HAD TO DIVERT WATER.			
22595 Sewage Spill	2/22/00 09:30:00	Raleigh	BILL GAINER SPILL LINE	SEWAGE	BECKLEY 2/22/00 08:20:00
		Comments : PUMP STATION OVERFLOWING.			
22844 Sewage Spill	3/8/00 10:00:00	Raleigh	BILL GAINER SPILL LINE	SEWAGE	BECKLEY 3/8/00 09:30:00
		Comments : PUMP STATION FORCE MAIN BROKEN.			
22845 Sewage Spill	3/11/00 14:36:00	Raleigh	DON BUCKLAND SINCERELY YOURS	SEWAGE	BECKLEY 3/11/00 14:15:00
		Comments : LIFT STATION OVERFLOW.			
22987 Sewage Spill	4/4/00 08:35:00	Raleigh	CHARLES SINCERELY YOURS	SEWAGE	BECKLEY 4/4/00 00:00:00
		Comments : BYPASSING.			
22988 Sewage Spill	4/7/00 10:00:00	Raleigh	BILL GAINER SPILL LINE	SEWAGE	BECKLEY 4/7/00 12:20:00
		Comments : PUMP STATION FORCE MAIN BROKEN; HAD TO SHUT DOWN TO DO SOME REPAIRS.			
22989 Sewage Spill	4/7/00 00:28:00	Raleigh	RAY PERDUE SINCERELY YOURS	SEWAGE	BECKLEY 4/7/00 00:20:00
		Comments : CHANGING A LINE OVER, CAUSING A BYPASS.			
22990 Sewage Spill	4/10/00 15:30:00	Raleigh	BILL GAINER SPILL LINE	SEWAGE	BECKLEY 4/10/00 11:15:00
		Comments : BLOCKAGE IN LINE.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY =** BECKLEY **TYPE =** ALL

Id Number / Entry Date / Incident Type	County	Caller / Recorded By	Material	Company Name / Date of Spill
22991 4/25/00 12:00:00 Sewage Spill	Raleigh	BILL GAINER		BECKLEY
		SPILL LINE	SEWAGE	4/25/00 11:00:00
	Comments :	CONTRACTOR CAUSED PROBLEM DURING CONSTRUCTION. REPAIR CREW ENROUTE.		
23165 5/23/00 20:07:00 Sewage Spill	Raleigh	RAY CLENDENIN		BECKLEY
		SINCERELY YOURS	SEWAGE	5/23/00 00:00:00
	Comments :	SEWER LINE BURST, WATER LEVEL ABOVE PIPE.		
23484 7/24/00 15:30:00 Sewage Spill	Raleigh	WAYNE BENNETT		BECKLEY
		SPILL LINE	SEWAGE	7/24/00 13:00:00
	Comments :	HIGH FLOW CAUSED LIFT STATION TO OVERFLOW.		
23666 7/31/00 17:02:00 Sewage Spill	Raleigh	RICK WAGNER		BECKLEY
		SINCERELY YOURS	SEWAGE	7/31/00 00:00:00
	Comments :	HIGH WATER OVERFLOW.		
23667 8/1/00 15:30:00 Sewage Spill	Raleigh	GREG WHITE		BECKLEY
		SPILL LINE	SEWAGE	8/1/00 13:30:00
	Comments :	BYPASSING DUE TO RAIN.		
23668 8/10/00 09:00:00 Sewage Spill	Raleigh	GREG WHITE		BECKLEY
		SPILL LINE	SEWAGE	8/10/00 08:30:00
	Comments :	BYPASSING DUE TO RAIN.		
23669 8/14/00 11:46:00 Sewage Spill	Raleigh	JIM SHAWVER		BECKLEY
		SINCERELY YOURS	SEWAGE	8/14/00 10:41:00
	Comments :	SPILL DUE TO LEAK IN SSO BOX.		
23670 8/18/00 16:46:00 Sewage Spill	Raleigh	CARL KING		BECKLEY
		SINCERELY YOURS	SEWAGE	8/18/00 16:30:00
	Comments :	PUMP FAILURE/ REPLACING PUMP, DIDN'T LOSE ANYTHING.		

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh COMPANY = BECKLEY TYPE = ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
23865 Sewage Spill	9/8/00 15:00:00	Raleigh	GREG WHITE SPILL LINE	SEWAGE	BECKLEY 9/8/00 10:30:00
		Comments : PUMPS WENT OUT.			
23866 Sewage Spill	9/25/00 12:28:00	Raleigh	JIM SHAWVER SINCERELY YOURS	SEWAGE	BECKLEY 9/25/00 11:15:00
		Comments : BYPASSING, SSO DISCHARGING.			
23969 Sewage Spill	10/12/00 13:04:00	Raleigh	BILL GAINER SINCERELY YOURS	SEWAGE	BECKLEY 10/12/00 12:15:00
		Comments : BREAK IN THE FORCE MAIN BESIDE HEAVY TRAFFIC ROAD.			
24147 Sewage Spill	12/17/00 10:32:00	Raleigh	WAYNE BENNETT SINCERELY YOURS	SEWAGE & STORMWATER	BECKLEY 12/17/00 09:00:00
		Comments : UPSET DUE TO HIGH WATER.			
24241 Sewage Spill	1/17/01 14:30:00	Raleigh	JIM SHAWVER SPILL LINE	SEWAGE	BECKLEY 1/19/01 13:00:00
		Comments : LIFT STATION OVERFLOWING.			
24242 Sewage Spill	1/17/01 10:30:00	Raleigh	BILL GAINER SPILL LINE	SEWAGE	BECKLEY 1/17/01 09:00:00
		Comments : RUPTURED FORCE MAIN.			
24243 Sewage Spill	1/23/01 12:42:00	Raleigh	JIM SHAWVER SINCERELY YOURS	SEWAGE	BECKLEY 1/23/01 09:00:00
		Comments : ELECTRICAL FAILURE ON A BREAKER.			
24379 Sewage Spill	2/15/01 14:30:00	Raleigh	JIM SHAWVER SPILL LINE	SEWAGE	BECKLEY 2/15/01 13:50:00
		Comments : LIFT STATION OVERFLOWING DUE TO RAIN.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh

COMPANY = BECKLEY

TYPE = ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
24380 Sewage Spill	2/25/01 09:23:00	Raleigh	WAYNE SINCERELY YOURS	SEWAGE	BECKLEY 2/25/01 08:00:00
		Comments :	STATION DOWN.		
24488 Sewage Spill	3/13/01 11:33:00	Raleigh	GREG WHITE SINCERELY YOURS	SEWAGE	BECKLEY 3/13/01 10:50:00
		Comments :	SPILL OF RAW SEWAGE.		
24489 Sewage Spill	3/15/01 14:30:00	Raleigh	JIM SHAWVER SPILL LINE	SEWAGE	BECKLEY 3/15/01 14:15:00
		Comments :	LIFT STATION OVERFLOWING DUE TO RAIN.		
24490 Sewage Spill	3/20/01 08:28:00	Raleigh	RAY PERDUE SINCERELY YOURS	SEWAGE	BECKLEY 3/19/01 18:20:00
		Comments :	BROKEN FORCE MAIN.		
24491 Sewage Spill	3/20/01 11:31:00	Raleigh	GREG WHITE SINCERELY YOURS	SEWAGE	BECKLEY 3/20/01 10:15:00
		Comments :	BYPASSING. NO INFO. ON FORM.		
24492 Sewage Spill	3/22/01 11:20:00	Raleigh	DON BUCKLAND SPILL LINE	SEWAGE	BECKLEY 3/22/01 09:30:00
		Comments :	OVERFLOWING DUE TO RAIN.		
24493 Sewage Spill	3/28/01 09:30:00	Raleigh	GREG WHITE SPILL LINE	SEWAGE	BECKLEY 3/28/01 08:50:00
		Comments :	WILL PROBABLY BYPASS DUE TO REPAIRS BEING MADE TO THE FORCE MAIN.		
24651 Sewage Spill	4/12/01 15:46:00	Raleigh	BILL GAINER SINCERELY YOURS	CHLORINATED SEWAGE	BECKLEY 4/12/01 15:20:00
		Comments :	FORCE MAIN BREAK, LITTLE WHITE STICK PUMP STATION.		

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY =** BECKLEY **TYPE =** ALL

Id Number / Entry Date / Incident Type	County / Caller / Recorded By	Material	Company Name / Date of Spill
24652 4/13/01 10:47:00 Sewage Spill	Raleigh DON BUCKLAND SINCERELY YOURS	SEWAGE	BECKLEY 4/13/01 10:10:00
	Comments : UPSET. OVERFLOWING		
24807 5/16/01 11:00:00 Sewage Spill	Raleigh GREG WHITE SPILL LINE	SEWAGE	BECKLEY 5/16/01 09:15:00
	Comments : BYPASSING DUE TO RAIN.		
24808 5/17/01 13:00:00 Sewage Spill	Raleigh TOM BUCKLAND SPILL LINE	SEWAGE	BECKLEY 5/17/01 10:00:00
	Comments : BYPASSING DUE TO RAIN.		
24809 5/22/01 10:00:00 Sewage Spill	Raleigh GREG WHITE SPILL LINE	SEWAGE	BECKLEY 5/22/01 09:30:00
	Comments : OVERFLOWING DUE TO RAIN.		
24817 5/23/01 10:00:00 Sewage Spill	Raleigh GREG WHITE SPILL LINE	SEWAGE	BECKLEY 5/23/01 09:00:00
	Comments : ELECTRIC CONTROL BOX GOT RIPPED OFF.		

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SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY = NORTH BECKLEY** **TYPE = ALL**

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
22513 Sewage Spill	1/4/00 13:15:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 1/4/00 11:30:00
		Comments : MAIN PLANT OVERFLOWING DUE TO RAIN.			
22514 Sewage Spill	1/6/00 10:30:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 1/6/00 09:00:00
		Comments : PUMP FAILURE AT LIFT STATION.			
22515 Sewage Spill	1/10/00 10:00:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 1/10/00 09:30:00
		Comments : OVERFLOWING DUE TO RAIN. INTERMITTENT APPROX. 8 HRS/DAY.			
22516 Sewage Spill	1/10/00 10:00:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 1/10/00 14:00:00
		Comments : MANHOLE OVERFLOWING.			
22517 Sewage Spill	1/10/00 10:00:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 1/10/00 09:30:00
		Comments : ELECTRICAL PROBLEM.			
22718 Sewage Spill	2/14/00 11:00:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 2/14/00 09:30:00
		Comments : OVERFLOWING DUE TO RAIN. STOPPED.			
22719 Sewage Spill	2/18/00 11:30:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 2/18/00 09:00:00
		Comments : MANHOLE CLOGGED UP.			
22720 Sewage Spill	2/24/00 09:00:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 2/23/00 18:15:00
		Comments : LIFT STATION HAS EQUIPMENT FAILURE.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY = NORTH BECKLEY** **TYPE = ALL**

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
22914 Sewage Spill	3/10/00 08:39:00	Raleigh	KIM DEAN SINCERELY YOURS	SLURRY	NORTH BECKLEY 3/10/00 04:00:00
		Comments :	SPILL SLURRY OUT OF SVR #2.		
22915 Sewage Spill	3/17/00 09:00:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 3/17/00 06:40:00
		Comments :	PROBLEM W/DIGESTOR DEVELOPED DUE TO CONSTRUCTION. HAD TO DUMP BACK TO PLANT. SETTLING CREATED A PROB		
22916 Sewage Spill	3/19/00 09:13:00	Raleigh	DALE BALLARD SINCERELY YOURS	SEWAGE	NORTH BECKLEY 3/19/00 07:30:00
		Comments :	BREAK IN LINE.		
23068 Sewage Spill	4/4/00 09:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 4/4/00 07:30:00
		Comments :	MANHOLES OVERFLOWING DUE TO RAIN.		
23069 Sewage Spill	4/17/00 13:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 4/17/00 07:30:00
		Comments :	MANHOLES OVERFLOWING DUE TO RAIN.		
23070 Sewage Spill	4/24/00 08:41:00	Raleigh	LARRY THOMPSON SINCERELY YOURS	SEWAGE	NORTH BECKLEY 4/24/00 08:00:00
		Comments :	PUMP STATION DOWN, BYPASSING.		
23071 Sewage Spill	4/25/00 10:00:00	Raleigh	LARRY THOMPSON SPILL LINE	SOLIDS	NORTH BECKLEY 4/25/00 10:00:00
		Comments :	MANHOLES OVERFLOWING DUE TO RAIN. MAIN PLANT TO CRANBERRY & VALUE CITY & SPRAGUE TO WHITESTICK CREEK		
23241 Sewage Spill	5/11/00 17:58:00	Raleigh	DALE BALLARD SINCERELY YOURS	WASTEWATER	NORTH BECKLEY 5/11/00 17:00:00
		Comments :	PUMP STATION OVERFLOWED @BECKLEY WEST APT.		

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY = NORTH BECKLEY** **TYPE = ALL**

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
23396 Sewage Spill	6/7/00 16:27:00	Raleigh	KIM DEANE SINCERELY YOURS	SEWAGE	NORTH BECKLEY 6/7/00 14:30:00
		Comments : AIR RELEASE VALVE STUCK OPEN, 127 ELM ST.			
23397 Sewage Spill	6/8/00 12:51:00	Raleigh	LARRY THOMPSON SINCERELY YOURS	SEWAGE	NORTH BECKLEY 6/7/00 22:00:00
		Comments : MAINLINE HAD A STOPPAGE. OVERFLOWED MANHOLE.			
23398 Sewage Spill	6/22/00 08:56:00	Raleigh	KIM DEAN SINCERELY YOURS	SEWAGE	NORTH BECKLEY 6/22/00 08:30:00
		Comments : PLANT WASH OUT.			
23399 Sewage Spill	6/26/00 09:00:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 6/25/00 00:00:00
		Comments : ELECTRICAL FAILURE.			
23400 Sewage Spill	6/26/00 11:19:00	Raleigh	KIM DEAN SINCERELY YOURS	SEWAGE	NORTH BECKLEY 6/26/00 08:30:00
		Comments : CONTRACTOR ONSITE, REPAIR TO ULTRA VIOLET DISINFECTANT UNIT. WILL BE TURNED OFF.			
23590 Sewage Spill	7/14/00 08:01:00	Raleigh	KIM DEAN SINCERELY YOURS	SEWAGE	NORTH BECKLEY 7/13/00 00:00:00
		Comments : PUMP FAILURE AT LIFT STATION.			
23591 Sewage Spill	7/24/00 15:30:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 7/24/00 15:00:00
		Comments : HIGH WATER CAUSED PLANT EFFLUENT TO OVERFLOW.			
23775 Sewage Spill	8/8/00 17:14:00	Raleigh	DALE SINCERELY YOURS	SEWAGE	NORTH BECKLEY 8/8/00 16:30:00
		Comments : BYPASSING.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY =** NORTH BECKLEY **TYPE =** ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
23776 Sewage Spill	8/10/00 10:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY [redacted] 8/9/00 11:30:00
		Comments : HIGH WATER CAUSED PLANT EFFLUENT TO OVERFLOW.			
23777 Sewage Spill	8/24/00 11:10:00	Raleigh	KIM DEAN SINCERELY YOURS	SOLIDS	NORTH BECKLEY [redacted] 8/24/00 23:59:00
		Comments : POSSIBLE SOLIDS SPILL.			
23918 Sewage Spill	9/2/00 21:28:00	Raleigh	DALE SINCERELY YOURS	SEWAGE	NORTH BECKLEY [redacted] 9/2/00 19:30:00
		Comments : WORKING BUT HIGH WATER.			
23919 Sewage Spill	9/2/00 21:28:00	Raleigh	DALE SINCERELY YOURS	SEWAGE	NORTH BECKLEY [redacted] 9/2/00 19:30:00
		Comments : WORKING, BUT HIGH WATER.			
23920 Sewage Spill	9/11/00 10:00:00	Raleigh	LARRY THOMPSON SPILL LINE	SOLIDS	NORTH BECKLEY [redacted] 9/11/00 10:00:00
		Comments : CONTRACTOR DUG INTO A LINE.			
23921 Sewage Spill	9/25/00 14:45:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY [redacted] 9/25/00 14:50:00
		Comments : HYDRAULIC OVERLOAD.			
23922 Sewage Spill	9/26/00 14:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY [redacted] 9/25/00 18:00:00
		Comments : BYPASSING DUE TO RAIN.			
24012 Sewage Spill	10/10/00 16:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY [redacted] 10/10/00 13:15:00
		Comments : BYPASS DUE TO RAIN.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh **COMPANY =** NORTH BECKLEY **TYPE =** ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
24013 Sewage Spill	10/19/00 10:17:00	Raleigh	KIM SINCERELY YOURS **Comments :** DOH CUT LINE.	SEWAGE	NORTH BECKLEY [redacted] 10/19/00 09:10:00
24014 Sewage Spill	10/21/00 08:12:00	Raleigh	DALE BALLARD SINCERELY YOURS **Comments :** PUMP STATION STOPPED.	SEWAGE	NORTH BECKLEY [redacted] 10/21/00 06:45:00
24015 Sewage Spill	10/26/00 10:00:00	Raleigh	DALE SPILL LINE **Comments :** STOPPAGE IN LINE.	SOLIDS	NORTH BECKLEY [redacted] 10/26/00 08:30:00
24107 Sewage Spill	11/28/00 10:00:00	Raleigh	DALE SPILL LINE **Comments :** MANHOLE STOPPAGE.	SEWAGE	NORTH BECKLEY [redacted] 11/28/00 09:00:00
24186 Sewage Spill	12/2/00 08:40:00	Raleigh	HARRISON SINCERELY YOURS **Comments :** PUMP STATION STOPPED UP WITH RAGS.	SEWAGE	NORTH BECKLEY [redacted] 12/2/00 07:00:00
24187 Sewage Spill	12/20/00 14:18:00	Raleigh	KIM SINCERELY YOURS **Comments :** BYPASSING.	SEWAGE	NORTH BECKLEY [redacted] 12/17/00 10:30:00
24188 Sewage Spill	12/17/00 11:22:00	Raleigh	KIM SINCERELY YOURS **Comments :** BYPASSING DUE TO HEAVY RAIN.	SEWAGE	NORTH BECKLEY [redacted] 12/17/00 06:23:00
24189 Sewage Spill	12/17/00 11:22:00	Raleigh	KIM SINCERELY YOURS **Comments :** BYPASSING DUE TO HEAVY RAINS.	SEWAGE	NORTH BECKLEY [redacted] 12/17/00 10:30:00

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh COMPANY = NORTH BECKLEY TYPE = ALL

Id Number / Incident Type	Entry Date	County	Caller / Recorded By	Material	Company Name / Date of Spill
24190 Sewage Spill	12/19/00 16:43:00	Raleigh	DALE SINCERELY YOURS	SEWAGE	NORTH BECKLEY 12/19/00 14:30:00
		Comments : MANHOLE OVERFLOW.			
24303 Sewage Spill	1/11/01 15:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 1/11/01 10:00:00
		Comments : MANHOLE STOPPAGE.			
24304 Sewage Spill	1/22/01 10:00:00	Raleigh	LARRY THOMPSON SPILL LINE	SOLIDS	NORTH BECKLEY 1/22/01 09:30:00
		Comments : PUMP STATION HAS ELECTRICAL PROBLEM.			
24309 Sewage Spill	1/16/01 09:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 1/16/01 07:00:00
		Comments : MANHOLE STOPPAGE AT 134 CANTERBURY DRIVE. STOPPED.			
24310 Sewage Spill	1/16/01 09:00:00	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 1/16/01 07:00:00
		Comments : MECHANICAL FAILURE @TREATMENT PLANT.			
24311 Sewage Spill	1/19/01 07:42:00	Raleigh	KIM DEAN SINCERELY YOURS	SEWAGE	NORTH BECKLEY 1/19/01 06:47:00
		Comments : OVERFLOW TO PUMP STATION DUE TO HEAVY RAIN.			
24312 Sewage Spill	1/19/01 09:00:00	Raleigh	KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 1/19/01 08:30:00
		Comments : DISCHARGING DUE TO HIGH FLOW.			
24442 Sewage Spill	2/16/01 16:38:00	Raleigh	KIM DEANE SINCERELY YOURS	SEWAGE	NORTH BECKLEY 2/16/01 00:00:00
		Comments : RAIN CAUSING HIGH FLOWS ABOVE CAPACITY.			

SPILL DETAIL REPORT

9/6/01

COUNTY = Raleigh COMPANY = NORTH BECKLEY TYPE = ALL

Id Number / Entry Date / Incident Type	County / Caller / Recorded By	Material	Company Name / Date of Spill
24573 3/9/01 13:00:00 Sewage Spill	Raleigh DALE SPILL LINE	SOLIDS	NORTH BECKLEY 3/9/01 12:30:00
	Comments : MANHOLE BACKED UP.		
24728 4/24/01 13:00:00 Sewage Spill	Raleigh DALE SPILL LINE	SOLIDS	NORTH BECKLEY 4/24/01 08:30:00
	Comments : PUMP STOPPED UP.		
24729 4/30/01 10:00:00 Sewage Spill	Raleigh KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 4/29/01 00:00:00
	Comments : FLOATS STUCK, CAUSING WET WELL TO OVERFLOW.		
24933 5/17/01 09:00:00 Sewage Spill	Raleigh KIM DEAN SPILL LINE	SEWAGE	NORTH BECKLEY 5/17/01 02:11:00
	Comments : BYPASSING DUE TO RAIN AND PUMP FAILURE.		
24934 5/17/01 09:00:00 Sewage Spill	Raleigh KIM DEAN SPILL INE	SOLIDS	NORTH BECKLEY 5/17/01 02:40:00
	Comments : OVERFLOWING DUE TO RAIN; SOLIDS DISCHARGING.		
24935 5/18/01 09:21:00 Sewage Spill	Raleigh KIM DEAN SINCERELY YOURS	SEWAGE	NORTH BECKLEY 5/18/01 05:30:00
	Comments : BYPASSING.		
24936 5/18/01 09:21:00 Sewage Spill	Raleigh KIM DEAN SINCERELY YOURS	SEWAGE	NORTH BECKLEY 5/18/01 07:00:00
	Comments : BYPASSING.		
24937 5/22/01 11:00:00 Sewage Spill	Raleigh KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 5/22/01 11:00:00
	Comments : HIGH FLOW CAUSING OCCASIONAL DISCHARGES FROM EFFLUENT.		

Comments : BYPASSING DUE TO RAIN.

24939 5/22/01 10:00:00 Sewage Spill	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 5/21/01 00:00:00
	Comments : BYPASSING			
24940 5/22/01 10:00:00 Sewage Spill	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 5/21/01 00:00:00
	Comments : OVERFLOWING.			
24941 5/22/01 10:00:00 Sewage Spill	Raleigh	KIM DEAN SPILL LINE	SOLIDS	NORTH BECKLEY 5/21/01 08:30:00
	Comments : BYPASSING.			
24942 5/25/01 11:27:00 Sewage Spill	Raleigh	KIM DEAN SINCERELY YOURS	SEWAGE	NORTH BECKLEY 5/25/01 00:00:00
	Comments : OVERFLOW.			

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From : "Pio Lombardo" <pio@lombardoassociates.com>
To : "Randy Boyd" <ranboyd@hotmail.com>
Subject : RE: proposed WQ stds
Date : Wed, 18 Jun 2003 01:11:04 -0400
Attachment : 030616FecalcolidataKenneyCreek.xls (24k)

Reply Reply All Forward Delete Put in Folder... Printer Friendly Version

Randy

A major issue with the change is that it will take away much of the basis for reducing bacterial pollution. You may wish to use the Winona Kenney Creek data that illustrates the change of fecal coliform with rain. Dry weather testing could easily miss the contamination that is moving downstream.

Pio

-----Original Message-----
From: Randy Boyd [mailto:ranboyd@hotmail.com]
Sent: Tuesday, June 17, 2003 9:15 AM
To: pio@lombardoassociates.com
Subject: Fwd: proposed WQ stds

Pio,
Thank you. Here are the proposed changes.I am testifying at the public hearing this wednesday at 7pm. I would prefer that I had at least an e-mail copy of your comments by then but realize this is very short notice and that it is gracious of you to agree to help us on this issue .IF YOU CAN WRITE A SHORT E-MAIL FOR WED.PRESENTATION FOLLOWED BY A FORMAL LETTER I WOULD APPRECIATE IT.

>From: Jesse_Purvis@nps.gov
>To: ranboyd@hotmail.com
>Subject: proposed WQ stds
>Date: Tue, 17 Jun 2003 09:04:10 -0400
>
>Randy,
>
>attached
>
>Jesse
>
>(See attached file: 2003FiledProposedRule.pdf)(See attached file:
>AppendixEcomparison20022003.pdf)

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RECEIVED
JUN 23 2003
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

June 19, 2003

Mr. Ed Snyder, Chair
Environmental Quality Board
1615 Washington St., East, Suite 301
Charleston, WV 25311-2126

Dear Mr. Snyder,

I am submitting the following comments for the more than 1660 members of the West Virginia Chapter of the Sierra Club. Please consider these comments as part of the official record for the proposed changes to West Virginia's water quality standards.

I believe that the work the Environmental Quality Board (EQB) does regarding the state's Water Quality Standards (WQS) is an essential component of protecting the rivers and streams of West Virginia.

1. Appendix A, Category B-2, Trout Waters

The efforts of the EQB, in concert with staff of DEP and the Division of Natural Resources (DNR), to review and update the list of streams eligible for protections provided trout waters (Appendix A, Category B-2, Trout Waters) is commendable. This list should be viewed as a working document. The EQB should remain receptive to additions throughout the triennial and revisit the list with DEP and DNR staff at the close of each triennial.

2. Section 46-1-7.2.a.2, Public Water Supply Exemption for Weirton Steel Corporation

Extending Weirton Steel's exemption another seven years (until September, 2010) is nearly the same as providing the "permanent" exemption which was objected to by many citizens, organizations and Department of Environmental Protection (DEP) officials, and ruled against by the EQB. Exemptions from water uses that provided protection to human and aquatic health are not good practice. A more progressive timetable toward a final solution to Weirton's need for exemption is overdue.

3. Appendix E, Water Quality Criteria

Updating West Virginia's numeric criteria for water quality parameters to the Environmental Protection Agency's (EPA's) National Recommended Water Quality Criteria, 2002 is an important process to insure that the state provide standards at least as protective as federal guidelines. West Virginia should protect its waters to the highest standard. It is recommended that updating the numeric criteria for water quality parameters become a periodic practice of the EQB and that the effort continue to be approached with the philosophy of at least meeting federal levels of protections for West Virginia's waters.

4. Fecal Coliform/E-Coli.

Fecal coliform parameters are applied for Primary Contact Recreation West Virginia where recreational contact is a part of its largest growing economic industry, tourism, and in a state which faces enormous infrastructure development challenges from straight piping to Combined Sewer Overflow (CSO) failures. Therefore, protections for primary contact recreation are amongst the most important parameter changes within the EQB's review.

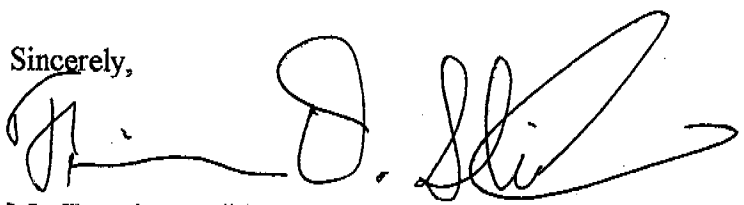
There are two key loopholes in the EQB's proposal. 1) Using a single sample for fecal coliform testing followed by an e-coli test is not possible because the water sample would be too old for viable e-coli testing after fecal coliform results are returned. The sample would need to be split and tested simultaneously for both parameters. 2) Elevated bacteria are very episodic and therefore any tests for e-coli which follow a fecal coliform test with criteria violations may not reflect similar conditions. This problem leaves a violation effectively undetected and, therefore a serious human health problem unresolved or at least deferred until the next testing cycle.

It is recommended that the EQB abandon its present proposal for sequential testing to a proposal incorporating a move to both tests over a period of three to five years. A transition will 1) allow the additional cost of e-coli testing to be spread out over time, 2) develop a history of data which would provide comparative data and help deal with the concerns of how to approach TMDL clean-ups based upon fecal coliform records, 3) provide for a timeframe for learning new testing procedures, and 4) move to a standard which provides insurance of protections for Primary Contact Recreation in West Virginia.

5. Turbidity

It is inappropriate to exempt from turbidity standards (Appendix E, 8.32.1) non-point sources exercising Best Management Practices (BMPs) and sites with surface mining permits. No where else is an entire industry or category of activity exempted from application of a criterion. And, excessive turbidity and the resulting sedimentation in streams carry considerable problems such as, impairing aquatic life, interfering with municipal and other drinking water supplies, affecting recreational enjoyment and altering stream channel shapes to the point of contributing to flooding. Extending exemption of turbidity standards to non-point activities and permitted surface coal mines places these risks inappropriately on an extensive portion of the state's waters. The exemptions should be removed.

Sincerely,



Mr. Francis D. Slider

Conservation Chair

West Virginia Chapter of the Sierra Club
Rt 1 Box 163-A2
Middlebourne, WV 26149

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conservancy

MAILING ADDRESS • P. O. Box 306 • Charleston, West Virginia 25321

Publishers of The Highlands Voice and the Monongahela National Forest Hiking Guide

June 23, 2003

From: Cindy Rank, Chair
WVHC Mining Committee and
FOLK Organizational Representative
HC 78, Box 227
Rock Cave, WV 26234

To: WV Environmental Quality Board
1615 Washington Street, East
Charleston, WV 25311

RE: 2003 Triennial Review: Title 46
Water Quality Standards (22B-3-4)

Chairman Snyder and Board,

Though unable to attend several of the meetings leading up to the proposed rule changes, we appreciate the opportunity to offer the following few brief comments.

When reviewing proposed changes to water quality standards, we normally ask at least two basic questions:

1) Do these changes further the fundamental objective of the clean Water Act "to restore and maintain the chemical, physical and biological integrity of the nation's waters"? (CWA Section 101(a)) I.e. Do these changes take us beyond the "fishable and swimmable" interim goal and move us toward the national goal of "eliminating" the discharge of pollutants? (CWA Section 101(a)(2) and (1))....and
2) Do these changes fulfill the responsibility and right of the states "to prevent, reduce and eliminate pollution" including "restoration, preservation and enhancement"? (CWA Section 101 (b))

In two instances of the proposed changes and one of omitted recommendations we must answer No to those questions.

PROPOSED CHANGES THAT DO NOT FURTHER THE GOALS OF THE CWA

1. 7.2.b. Water Quality Standards (WQS) apply at all times when flows are equal to or better than the 7Q10. The exception from numeric water quality standards when flows are less than 7Q10 is currently not extended to trout waters but is now being proposed to apply to trout waters if "natural conditions" can be demonstrated to warrant a relaxation of criterion.

1 of 3

The current language should be maintained. Requiring discharges into trout streams to meet for example the pH, Iron and Aluminum criterion will enhance the quality of those streams and in so doing fulfill the states responsibility under the CWA. Also, the lure and economics of trout fishing has prompted the WV DNR to add lime fines to enhance some of these same streams. Exempting discharges from current standards could run counter to these efforts.

2. **Fecal Coliform/Bacterial Criterion**

Proposed language concerning the fecal coliform criterion is a step backwards as well. Rather than clarifying requirements to assess the presence of harmful bacteria the proposed language confuses and loosens those requirements. Time sensitive testing for e-coli, etc. would require a second sampling at a different time and would therefore skew the results. We support the comments submitted on behalf of the Appalachian Center for the Economy and the Environment (ACEE) on these matters.

THE OMMISSION OF CHANGES THAT WOULD FURTHER CWA GOALS

WVHC and FOLK continue to be concerned about the Turbidity Criterion in Appendix E, Table 1. We have never believed it appropriate to exempt coal mining operations from this standard. We recognize that mining activities such as valley fills that are located in the headwaters of streams preclude the ability to sample upstream for comparison with a sample from a point downstream as required by the current Turbidity standard. However, other discharge points in mining operations would allow for this comparison and should be required to do so.

As comments submitted by ACEE also indicate, the current technology based effluent limits for TSS in the mining program are often inadequate to protect the quality and uses of streams – especially during rain events. In addition to the rationale and examples in those comments, we would submit that the current TSS effluent limit in mining permits does not addresses the narrative standards in Section 3 of this rule that prohibit industrial wastes to cause any "visible floating or settleable solids, suspended solids...." (46CSR 3.2.a.)

We see eliminating the exemption for coal mining from the Turbidity standard as only one step in the process to adequately promote appropriate water quality based effluent limits for use in the NPDES program for coal. Section 3. of this rule clearly indicates that sediment loading is unacceptable in all waters, and yet neither the turbidity standard in Appendix E nor the technology based TSS effluent limit is sufficient to prevent sedimentation problems from coal mining operations. The Board should attempt to develop some criteria to address the issue of solids (settleable and suspended) pollution of streams from these operations, especially during rain events.

ADDITIONAL COMMENTS

1) We agree with other commentors that the expanded list of Trout Waters in **Appendix A** is a welcome addition. Of greatest importance though is maintaining the introductory caveat that indicates Appendix A is a list of 'known' trout waters and is not meant to exclude any waters that meet the definition in Section 2.20.

(It is however curious that while Appendix A has been expanded, Appendices B, C & D have been eliminated.)

2) While eliminating the **Weirton Steel exception** all together would have been preferable the Boards effort to limit that exception is a small step in the right direction.

MINOR CORRECTIONS

- We assume that the word 'about' should be 'above' DLM drain on page 25 (Appendix A – listing of MTB-28 in Upshur county for Big Run of the Buckhannon.)
- We also assume that Appendix 'E' will become Appendix 'B' …etc…

ADDITIONAL SUGGESTION

The Board is considering deleting the date in Section 8.1.a. and instead making reference to 'the most recent effective version' of 40 CFR 136 "Guidelines…". Such a change is acceptable especially if anyone viewing the rule could also be informed that the Board has and can make available an up-to-date listing of where to find this as well as any other guidance, rule, regulation, etc. that is referred to throughout Title 46. I.e. a list providing current websites, addresses, contacts, etc.

Thank you for allowing us the opportunity to comment.

Mindy Rank

WVHC 6/23/03 3 of 3



New River Health Association

P. O. Box 337 / Scarbro, West Virginia 25917 / (304) 469-2905
Fax: (304) 465-5486 www.newriverhealth.org

Mr. Ed Snyder, Chair
Environmental Quality Board
1615 Washington St., East, Suite 301
Charleston,WV 25311-2126

June 18, 2003

RE: TRIENNIAL REVIEW OF WATER QUALITY STANDARDS REVIEW:
COMMENTS RELATED TO THE FECAL COLIFORM STANDARD

Dear Mr. Snyder,

As members of the New River Health Association Clinical Provider Group we would like to provide comments opposing the proposed changes to the fecal coliform standard for contact recreation.

We find two key glaring weaknesses in the EQB's proposal. Using a single sample for fecal coliform followed by an E.coli test is not possible because the water sample would be too old for accurate testing after the fecal coliform tests are performed. Secondly, elevated levels of bacteria from sewage overflows are episodic and therefore any tests for E. coli which follow a fecal coliform test with criteria violations may not reflect similar conditions. This leaves violations undetected, unreported and a potential risk to human health.

Fecal coliform is a critically important standard related to public health. A valid bacterial standard is important in protecting all of West Virginia's citizens who use and recreate in our waters. A single weekend epidemic of salmonella or campylobacter could have serious effects on the health of those citizens.

According to the Center for Disease Control (CDC), "the most frequent waterborne disease illness reported is gastroenteritis" yet more serious diseases can occur from exposure to bacterial infected waters. "Infection with cryptosporidium can occur after swallowing as few as 10-100 oocysts, swallowing a single mouthful of contaminated water could cause illness. The CDC reports that "during 1997-1998 four deaths were caused by primary amebic meningoencephalitis... The water could enter through a person's body through the nasal passages when water is forced up the nose." Although this is rare, this example illustrates the potentially serious effects of waterborne disease.

The Board must reconsider this provision and promulgate a rule that is protective of public health and scientifically sound.

Sincerely,

Daniel Doyle MD

Mark S Rubin, R.Ph.

Scott Broon, RPh

Linda Scarborough RN C-FNP

Mary Powell MSW, LCSW

Jennifer Bozel, Physician Assistant - C, Medical Director

[illegible], RN, MSN, CNM

Sanjay R Mellado

Shazia Akbar M.D

Sharon Offley MSN, CNM

Chris Darrow PA-C

Miriam Rogin, M.D.

Tammy R. Smith - Certified Family Nurse Practitioner

Tammy Campbell, Certified Family Nurse Practitioner

Mariani Didyk, PA-C

POTESTA

POTESTA & ASSOCIATES, INC.
Engineers and Environmental Consultants

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JUN 23 2003
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AIR QUALITY BOARD

June 20, 2003

Dr. Scott Simonton
West Virginia Environmental Quality Board
1615 Washington Street, East
Suite 301
Charleston, West Virginia 25311-2126

RE: Comments on Turbidity

Dear Dr. Simonton:

This letter is a follow-up to the Environmental Quality Board hearing on the triennial revision to the Water Quality Standard that was held on June 18, 2003. I appreciate your time and effort in listening to my comments on the subject of turbidity.

I have included a written copy of those comments for your convenience. A copy of this letter is being provided to the other members of the Board.

I thank you for your consideration of these comments and your service as a member of the Environmental Quality Board.

Sincerely,

Lisa K. Burgess

Lisa K. Burgess

LKB/mh

Enclosure

2300 MacCorkle Avenue, S. E. - Charleston, West Virginia 25304 • Phone: (304) 342-1400; Fax: (304) 343-9031; www.potesta.com

I am Lisa Burgess, with Potesta & Associates, and I appreciate this opportunity to speak to you this evening. My remarks are in response to your request for comments and suggestions on the proposal to remove the exemption to the turbidity standard for mining activities.

I would suggest to you that this exemption should remain in place.

Turbidity is not a pollutant; turbidity is only an indicator of the potential presence of pollutants. The health and environmental effects often attributed to turbidity are actually due to solids in the water column. The turbidity-labeled health concerns in raw water used for drinking water supplies are actually due to the presence of suspended organic and inorganic materials that provide a haven for microbes; shielding them from disinfection. Gill clogging and abrasion in fish is caused by suspended solids - not turbidity. Reproductive declines in fish through egg or fry mortality are not caused by turbidity; they are caused by siltation. And, benthic macroinvertebrates are smothered or starved by solids that settle on the streambed - not by turbidity.

Turbidity is actually a measure of an optical property of water where light is scattered and absorbed rather than being transmitted. It's a qualitative measurement that can't be assigned a mass and many substances present in surface water cause this effect.

Some of these substances, like suspended clay, silt and other inorganic solids, are pollutants that can cause harm to the aquatic environment and should concern us. Some of these materials come from earth-disturbing activities that include construction of shopping mall, hospitals, schools, highways, and mining activities. Other substances that contribute to this light scattering effect in water are finely divided organic matter, color-inducing substances such as tannins from leaf litter, plankton and other microscopic organisms that are naturally occurring and necessary to the balance of aquatic ecosystems.

The agents of harm to the aquatic environment coming from earth disturbing activities are solids. We have commonly available analytical tools that can check for these pollutants. Total suspended solids analysis is a measure of the dry weight of solids present on a filter through which a known volume of sample has been passed. It is expressed as mg/l. Settleable solids analysis is a measure of the volume of total solids

that will settle to the bottom of a cone-shaped container, called an Imhoff cone, in a 60-minute period. Settleable solids are expressed as ml/l. Unlike turbidity analysis, both of these are quantifiable procedures that produce practical estimates of the amount of solids present in a given sample.

The good news is that surface mining NPDES permits already contain enforceable limits on both total suspended solids and settleable solids.

Turbidity is a test that has been historically used to indicate the presence of solids because it's cheap and easy, when compared to conventional solids analysis. The problem with using turbidity as a water quality standard is that it does not tell us if the cause of the turbidity reading is actually a pollutant that should be a source of concern.

In conclusion, I can only say that it would be terribly ironic if coal were to lose this exemption because coal is the only earth-disturbing activity subject to the criterion that is also subject to engineering controls and enforceable permit limits for the discharge of solids.

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Engineers and Environmental Consultants

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AIR QUALITY BOARD

June 20, 2003

Dr. Scott Simonton
West Virginia Environmental Quality Board
1615 Washington Street, East
Suite 301
Charleston, West Virginia 25311-2126

RE: Comments on Turbidity

Dear Dr. Simonton:

I want to thank you for taking the time to hear my comments on turbidity. I know serving on the Environmental Quality Board can be very demanding, and I am reasonably sure that I could never do it. The public service you provide is appreciated.

I have included a written copy for your convenience. I have sent similar packages to the other members of the Environmental Quality Board.

Once again, thank you for you consideration of these comments.

Sincerely,

Laidley Eli McCoy

LEM/mh

Enclosure

2300 MacCorkle Avenue, S. E. - Charleston, West Virginia 25304 • Phone: (304) 342-1400; Fax: (304) 343-9031; www.potesta.com

Comments of Laidley Eli McCoy

June 18, 2003

Environmental Quality Board
Water Quality Standards Revisions Public Hearing

I appreciate the opportunity to offer comments on the proposed change to the water quality standard for turbidity. As I consider the current Environmental Quality Board (EQB) or Water Resources Board composition, I do not believe any of the board members or support staff were involved with the original adoption of this standard. I was.

In July 1979, when I began working for the Division of Water Resources (DWR), Department of Natural Resources, one of the first project assignments was the pending turbidity issue. After doing some rudimentary research, I told Dave Robinson, then Chief of DWR, that the standard being proposed was impossible to meet. We then set out find a way to turn this negative into a positive. The connection between non-point source activities and turbidity was obvious even then. It has not changed. We hit upon the idea of using this impossible standard to encourage the utilization of best management practices in agriculture, logging, construction and other soil disturbing industries. That would be accomplished through the use of an exemption to the standard if best management practices were being followed.

At that time the coal industry was the only non-point type of industry being regulated as a point source. This industry already had best management practices in place, in the form of mandatory permit requirements and performance standards. They had already reached the level of performance where we hoped to someday have the other earth disturbing activities. The decision to include them in the exemption was actually easy to make. It made sense and was believed to be the right thing to do. I still believe it is the right thing to do. The mining industry has stricter controls than any of the other non-point activities. They have permit applications that actually require extensive engineering and physical controls unlike some other non-point activities.

You will hear statements tonight about the solids complex (Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Total Solids (TS), Settleable Solids (SS) and Turbidity, and how they relate to each other. You will hear how the West Virginia Division of Environmental Protection, recognizing the nature of mining activities, has provided for an exemption to the TSS permit limit during storm events and replace it with a Settleable Solids limit; all approved by the Office of Surface Mining.

Some may have concerns over enforcement of permit conditions for the coal industry. There is no other industry in this state that has the number of inspector, on-site hours logged as this industry.

This includes facilities that generate hazardous wastes and we are, after all, primarily talking about regulating dirt for the mining industry.

Narrative standards are in place that address objectionable color, floating solids, and excessive solids deposits on the stream bed. These valid standards can be enforced by an inspector without any laboratory analyses. When a facility has the protection of the turbidity exemption, they can still be cited for violation of these narrative standards.

I spent approximately 18 years in the environmental regulatory agency for the State of West Virginia, and tell you now that I strongly believe that the water quality standard for turbidity should be maintained as is. The coal industry, more so than many of the other non-point activities, expends significant resources to reduce the impacts of solids which may leave their sites.

Removal of the exemption will not result in any overall improvement in water quality.

I have prepared some containers of water with various turbidity readings. First I have a container with 10 NTUs. Here is one with 20 NTUs. Note that without the exemption, if the background stream is 20 NTUs, then the outfall can only be 10 NTUs. This is a visual standard. Do you see a difference?

Next we have a sample of 250 NTUs. Without the exemption one could add a discharge which raised the downstream NTU reading to 285. That is an increase of 35. Here is a container of water with a reading of 35 NTUs. This means we can increase the downstream reading to 285 NTUs. Do you see a difference? My point is that we are considering imposing these changes to what amounts to a visual standard, and my eyesight cannot distinguish between them.

I brought these props to give the Board a realistic understanding of what is being considered. These visual examples, I hope, will help you understand the difficult nature of this standard and the importance of this exemption to the coal industry as well as the other non-point activities.

Our surrounding states have generally not seen the need to have a turbidity standard. The only exception is Maryland.

The existing language in the turbidity standard was developed to encourage the use of best management practices. We have 30 years (1972 passage of the Federal Clean Water Act 92-500) of public policy behind encouraging the use of BMPs and this exemption has played a key role in the process for 20 years. That significant body of public policy should not be reversed lightly.

In closing, I encourage the EQB to keep the exemption in place for the coal industry. As an industry, they have done more to institute solids controls on sources leaving their sites than the other non-point activities. They should not be punished for their superior level of performance in this area.

Pamela F. Faggert
Vice President and Chief Environmental Officer
5000 Dominion Boulevard, Glen Allen, VA 23060
Phone: 804-273-3467

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ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

June 19, 2003

Dr. Ed Snyder
Chairman
Environmental Quality Board
1615 Washington Street, East
Suite 301
Charleston, West Virginia 25311-2126

RE: Triennial Review of Water Quality Standards (46 CSR 1)

Dear Dr. Snyder:

Attached please find Dominion's comments on the proposed revisions to West Virginia's Requirements Governing Water Quality Standards (46 CSR 1). Dominion owns and operates a number of facilities that discharge to West Virginia surface waters under NPDES permits and would be impacted by the proposed revisions.

Dominion appreciates the opportunity to provide the Environmental Quality Board (EQB) with these comments. In addition, we incorporate by reference the comments of both the West Virginia Chamber of Commerce and Manufacturers Association. The members of these organizations have significant technical expertise and experience related to water quality issues in West Virginia, in neighboring states as well as nationally.

Dominion is committed to operating our facilities in a manner that is protective of human health and the environment, and we will continue to work constructively with the Board to ensure that West Virginia Water Quality Standards are based on the best available science and public policy.

Please contact Ken Roller at (804) 273-3494 should you have any questions or concerns relative to these comments.

Sincerely,

Pamela F. Faggert

Pamela F. Faggert

Attachment

Dominion's Comments on Proposed Revisions to West Virginia Requirements Governing Water Quality Standards (46 CSR 1)

Appendix A—Category B-2-Trout Waters

The Board proposes to designate over 400 additional West Virginia streams and rivers as Category B-2 Trout Waters based primarily on a recommendation from the Division of Natural Resources (DNR). Dominion believes that many of these streams, however, do not meet the West Virginia Water Quality Standards (WQS) definition of "trout waters" and, therefore, should not be designated as such. Furthermore, we are unaware of any technical demonstrations supporting the assertion that the instream water quality of each stream can sustain a "year-round trout population," and the Board has not fully analyzed the economic effects of this proposed action on local businesses and municipalities. As explained below, Dominion believes the Board should withdraw this proposal and develop a more comprehensive and suitable process for making this and future designations.

The Proposal Is Not Supported by Fact or Law

Dominion recently consulted with DNR personnel and learned that their listing recommendation is based almost exclusively on whether a stream has been recently stocked with trout. It is Dominion's understanding that these recommendations are supported by neither a consistent nor comprehensive consideration of whether the physical, chemical, and biological characteristics of a particular stream are capable of supporting sustained trout populations, including post stocking determinations of stocking success and population sustainability. The WQS defines trout waters as "streams or stream segments which sustain year-round trout populations." Additionally, the definition of trout waters in the WQS specifically excludes "those streams or stream segments which receive annual stockings of trout, but do not support year-round populations." Consequently, there is a serious disconnect between DNR's listing approach and the definitions specified in the WQS. In light of the overwhelming number of streams proposed for inclusion in Appendix A and the availability of fishery and water quality data for several of these streams, including the Stony River and Difficult Creek in Grant County, Dominion believes that many of the proposed trout waters have characteristics that prevent attainment of the use as defined in the WQS.

Waters of sufficient quality to attain the trout water classification are protected under the WQS by Category B-2 water quality criteria that are, in a number of cases, substantially more restrictive than the Category B-1 criteria applied to warm water fisheries. The one-time or periodic stocking of trout in a waterbody, or a portion thereof, by the DNR does not mean that it, or that portion, should be reclassified as a cold water fishery subject to the more stringent Category B-2 water quality criteria. Because of the potential costs to businesses and municipalities associated with these designations, and because of the scientific question as to whether the particular water body could support a cold water fishery, a systematic evaluation of stream reclassification is needed. At a minimum, costly measures to address water quality should not be required when there is no likelihood of a successful outcome (sustained trout population). Dominion recommends that, prior to listing a water in Appendix A, the Board require a demonstration that the water will "sustain year-round trout populations" in accordance with Section 2.20 definition of trout waters. Such a showing should include, at a minimum, seasonal water quality as well as biological data that demonstrate that the instream water quality can sustain a "year-round trout population". This approach is consistent with the antidegradation implementation requirements for nominating and designating Waters of Special Concern and Outstanding National Resource Waters, which require objective classifications based on sound science.

An excellent example of these concerns is the Stony River located in Grant County. The Board seeks to designate the entire Stony River as "trout water" – based on DNR's trout stocking efforts – without considering the historic and existing water quality data and the potential impact on Dominion's Mt. Storm Power Station, located on the Stony River in Grant County. A considerable amount of historical data exists for the Stony River and its tributaries. Much of this data has been generated through a collaborative effort between Dominion and state and federal agencies including EPA, USGS, WVDEP and WVDNR, and is available through the public record. These data demonstrate that a substantial portion of the Stony River does not support the "trout water" use, and consequently, that listing the Stony River in Appendix A is inappropriate.

The Board Did Not Adequately Consider Economic Impacts

Because of the potential adverse economic impacts of the more restrictive Category B-2 criteria, the Board is required by law to evaluate the economic effects of this proposal. There are two independent requirements for evaluating the economic impact of the Board's rule. First, all legislative rules must include a fiscal note. See WV Code § 29A-3-9, incorporating WV Code § 29A-3-4. The fiscal note attached to the Board's proposal is inadequate because it says there are no associated costs of this action. This, however, is not the case because all existing or future point and nonpoint source operations on or in the vicinity of the proposed "trout waters" will be required to meet more stringent discharge or best management practice requirements.

The second requirement is mandated by WV Code §§ 22-11-2 and 22B-3-4(b) which require that the Board establish water quality standards that consider "the expansion of employment opportunities, maintenance and expansion of agriculture and the provision of a permanent foundation for healthy industrial development". The need to consider economic development and expansion must be balanced with environmental protection. Therefore, a rigorous economic analysis of this proposal should be developed and made available for comment by interested and affected parties. Without this analysis the Board fails to comply with the Administrative Procedures Act and risks a challenge to the final rule.

The Board Should Develop a Designation Process

One possible remedy to the trout waters designation issue is for the Board to recognize that all trout waters are not of the same quality, and therefore, do not deserve the same level of protection. Due to many factors, natural as well as anthropogenic, the quality of West Virginia waters ranges from those streams that can support trout for only a limited portion of the year to those that support "native" trout. In order to reflect this reality the Board should change the definition of "trout waters" and/or develop appropriate scientifically-based implementation procedures to recognize the following three trout water classifications: (1) waters that sustain stocked trout for a portion of the year, (2) waters that sustain stocked trout year-round and (3) the more ecologically and socially important "native" or "naturally reproducing" trout waters. Since

they sustain trout for only a portion of the year, classification 1 waters should be protected with Category B-1 water quality criteria. Classification 2 streams would require somewhat more protective criteria than classification 1 streams because they support trout year-round but do not support propagation. And, classification 3 streams should receive Category B-2 criteria protection because they support "native" or naturally reproducing populations.

Both Pennsylvania (Title 25, Chapter 93.3) and Virginia (9 VAC 25-260-370) differentiate seasonally stocked trout waters from the higher classifications of Cold Water Fishes (Pa) and Wild Natural Trout Streams (Va) and apply the appropriate numeric criteria specific to protecting that use. For example, Pennsylvania has a use designation (TSF), which is specific to waters suitable for maintenance of stocked trout for the period from February 15 to July 31. Water Quality Criteria protective for the TSF use are found in Chapter 93.9 of Title 25 and, in the case of temperature, are clearly different from criteria for the protection of year-round trout fisheries under the Cold Water Fishes (CWF) designated use. Virginia's classification system differentiates between waters suitable for maintenance of wild trout populations (Natural Trout Water) and for the year-round holdover of stocked trout (Stockable Trout Waters). In Virginia, a stream is considered unsuitable for any type of trout fishery under any of the following conditions: (1) summer temperatures are unsuitable for trout survival; (2) the stream contains a significant population of warm water gamefish; (3) insufficient flow; or (4) intolerable water quality. The Virginia and Pennsylvania approaches are pragmatic and enjoy broad base public support because they directly recognize the realistic attainability of the use within specific waters and indirectly incorporate both social and economic considerations into the designations.

The Pennsylvania and Virginia approaches are also consistent with an example of properly designating uses contained in EPA's Water Quality Standards Handbook: Second Edition (EPA-823-B-94-005a, August 1994). Section 4.4.2 of the EPA handbook describes a scenario where a stream does not support an existing use as a cold water fishery even though it sustains a small cold water fish population. In this example, the existing stream temperatures are unsuitable for a "thriving" cold water fishery, and the small marginal population that is present is considered by EPA to be an artifact and should not be employed to mandate a more stringent use (true cold water fishery). EPA states that under this type of situation "[a] use attainability analysis or other

scientific assessment should be used to determine whether the aquatic life population is in fact an artifact or is a stable population requiring water quality protection."

By recognizing and differentiating the level of protection required for various existing trout water uses the Board would make the rule more representative of actual conditions as well as consistent with the definition of Outstanding Resource Waters in the antidegration procedures. This action would avoid requiring unnecessary control costs for dischargers to meet B-2 criteria in streams that are, in reality, not coldwater fisheries.

Conclusion

In conclusion, Dominion believes there is a serious disconnect between the DNR's approach to recommending streams for inclusion in Appendix A and the current definition of "trout waters" in the WQS. As a result, we believe that adopting the proposed list will result in the incorrect designation of many streams, which could yield serious socioeconomic impacts which the Board has failed to consider as required by law. In light of the above, Dominion recommends that the Board withdraw its current proposal to modify the Appendix A list. We also recommend that West Virginia develop a more comprehensive process for determining whether the characteristics of water are adequate to support "trout waters" use and that this process be use in developing subsequent listing proposals.

§ 3.2.d: Taste and Odor Prohibition

The Board proposes to modify this general condition prohibiting the introduction of substances that adversely affect taste and odor by adding the sentence "USEPA's organoleptic effect criteria may be used when applicable". There are numerous EPA organoleptic criteria, which have been developed by various EPA programs for application to a wide range of environmental situations. Consequently, Dominion is concerned that the Board, by inclusion of such a vague reference to USEPA organoleptic criteria, is in effect adopting any number of specific numeric criteria for potential application in the state's regulatory programs. Such ambiguity precludes knowledge concerning which of EPA's organoloeptic criteria are being considered for use in West Virginia, and under which situations the state will determine that their application is appropriate. The state

should be more specific in its establishment of water quality standards in order to ensure that criteria suitable to West Virginia waterbodies are adopted following adequate opportunity for public comment, and are appropriately implemented following adoption. In light of the above, Dominion recommends that the Board not modify § 3.2.d as proposed.

§ 9.2.a. and b: Definition of Bioaccumulative

The Board is soliciting comment as to adoption of the Great Lakes Initiative (GLI) standard for determining whether a substance is bioaccumulative. Dominion believes that the current definition of "cumulative" is too vague, and can lead to the development of ad hoc water quality criterion that are overly protective using procedures found in § 9.2.b. Therefore, we would support a more technically-based definition of bioaccumulation that more accurately reflects a pollutant's potential to reach harmful concentrations in aquatic biota. We do not, however, support the adoption of any GLI-based definition, procedure, or standard without an adequate showing that it is directly applicable to West Virginia surface waters. The GLI initiative was developed because the Great Lakes are unique and demand special consideration of bioaccumulative substances due to the lakes long retention times. The hydrology and other physicochemical features of the Great Lakes contrast sharply with that of most West Virginia streams and rivers. For this reason, direct application of the GLI standards and procedures is not appropriate for WV waters without additional supporting technical demonstration.

APPENDIX E WATER QUALITY CRITERIA

General comments

The Board proposes to adopt the EPA's National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047) as the state criteria. A number of changes are proposed to the existing criteria and the Board also proposes to add over 70 additional water quality criteria to comport with EPA's recommendations. We can understand, and have no objection to, the Board's desire to update WV criteria to comport with EPA's most recent criteria as long as they are sound. However, we question why the Board did not propose to modify existing WV criteria, such as dissolved oxygen (see below), to be consistent with EPA's recommendations. In addition, we

are concerned that the state, by mandating use of the 7Q10 as the critical design flow for establishing effluent limits for carcinogens, is effectively proposing water quality criteria for carcinogens that are much more restrictive than the 10^{-6} risk level prescribed in § 8.2.a. Furthermore, the need to adopt over seventy new water quality criteria for organic chemicals should be reevaluated and the criteria for a particular pollutant adopted only where there is credible evidence that the pollutant is present in, and/or is discharged to, West Virginia surface waters and can reasonably be expected to interfere with designated uses.

Mandatory use of the 7Q10 design flow results in criteria that are more restrictive than the prescribed 10^{-6} risk level.

Section 8.2.a establishes a risk level of 10^{-6} for human health criteria for carcinogens (Water Use Categories A and C). This risk level was adopted by West Virginia following substantial debate, and is considered to be "essentially negligible risk, appropriate, and protective of human health in the state."[1] Although not specifically stated, Section 8.2.b. requires the use of the 7Q10 flow in the development of effluent limits for carcinogens. According to EPA, the harmonic mean is the appropriate design flow for determining long-term exposures using steady state modeling of effluent (i.e., the type of process typically used by WVA permit writers).[2] The harmonic mean flow is considered appropriate because it relates hydrologically to the long-term exposure assumption that forms the basis for the criteria. Use of "extreme value statistics" such as the 7Q10 flow in developing permit limits for carcinogens is not recommended by EPA because there is no consistent relationship with the long-term mean dilution.

Use of the 7Q10 stream flow is not only considered inappropriate by EPA, but can also lead to the development of effluent limitations that are considerably more restrictive than is necessary for the protection of water quality. EPA compared the 7Q10 and harmonic mean stream flows determined for 60 streams. In all cases, the long-term harmonic mean flows were at least 2 times the 7Q10 flows. In addition, 54 of the 60 streams had harmonic mean flows greater than 2.5 times the 7Q10, and 40 of the 60 harmonic mean flows were equal to, or greater than, 3.5 times

[1] See SWRB Rationale Document for Revision of Legislative Rules, Title 46-Series 1 Water Quality Standards. August 19, 1991.

the 7Q10. Based on this information, and considering that permit writers are required by regulation to impose effluent limits for carcinogenic criteria using the 7Q10 flow, effluent limits for carcinogens are likely to be 2 to 3.5 times more restrictive than necessary to protect for the 10^{-6} risk level. Consequently, Dominion recommends that the Board modify the water quality standards regulation to allow for use of the harmonic mean flow with human health criteria for carcinogens, or adopt a permitting procedure that adjusts the effluent limit to account for the difference between the 7Q10 and harmonic mean determined for a particular stream.

There should be a demonstrated link between the adoption of additional water quality criteria and the potential for related adverse impacts to West Virginia surface waters.

The existing criteria list encompasses most, if not all, the pollutants one would expect to be present in, or discharged to, West Virginia waters. Consequently, Dominion questions the soundness of the rationale behind the proposal to promulgate criteria for pollutants that one would not reasonably expect to be present. Moreover, many of the proposed organic criteria are based on limited toxicity data simply because these chemicals are not commonly found nationwide. Therefore, we suggest that the Board withdraw the proposed wholesale adoption of the EPA criteria and begin consultation with the DEP to determine, through a more rigorous and scientifically sound process, which, if any, of the pollutants may be present in West Virginia waters at concentrations sufficient to adversely affect water quality.

Dominion also suggests that the Board consult with neighboring state regulatory agencies to determine if they have promulgated criteria for these organic chemicals and, if so, the underlying reason for such action. In the interim, the state's waters will continue to be fully protected because the DEP is required to review each permit application for the presence of EPA's 126 priority pollutants. When a pollutant is identified that has a "reasonable potential" to cause an adverse water quality effect the Agency has the authority to establish an effluent limitation derived from the "best available science" which may or not be the EPA criteria. This is a practical approach that will ensure that the best interests of the DEP and public are considered and protected.

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[2] Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001. March 1991. p 88

Comments on Specific Criteria

§ 112.a Oxygen-dissolved (DO)

As noted above we are concerned that the Board did not propose to adopt EPA's recommended DO criterion along with the many other EPA criteria that are proposed for adoption. In many cases the Board has proposed the adoption of criteria for toxic pollutants with no demonstration that they are appropriate or necessary for the protection of West Virginia surface waters. In contrast, there is clear evidence that West Virginia's existing DO criterion is overly protective as it is significantly more stringent than the EPA's Gold Book and the 2002 recommended standard. Not only are the EPA's minimum concentration levels (for both warm and cold water aquatic life) lower than the Board's existing criteria, but EPA also provides for both a 7-day mean and minimum concentration. Thus, EPA's criteria recognizes that DO concentrations at any given time may be below the average value, due to natural conditions, without having an adverse effect on aquatic life. Since DO levels in a natural system (e.g., Blackwater River) can cycle as much 3-4 mg/l over 24-hours it is unreasonable to retain the existing minimum concentration for all the state's waterbodies. Many factors directly affect DO concentrations including but not limited to temperature, barometric pressure (related to elevation), nutrient inputs and oxygen demand related to respiration as well as inorganic oxidation and organic decomposition. Therefore concentration is always fluxing and a realistic water quality criterion should reflect this reality.

Dominion understands that it has been the position of DEP that adoption of an average concentration criterion would administratively complicate their compliance monitoring and enforcement obligations. Such perceived complications could be easily overcome by requiring real-time in-stream DO monitoring for dischargers with limits established to protect for the average DO criterion. Equipment for performing "real-time" monitoring is readily available and relatively inexpensive in comparison to maintaining compliance with the existing higher minimum DO criterion.

Had the EPA's criterion been in place there would have been no need to develop a TMDL for the Blackwater River and possibly other TMDLs could be averted as well. The Nutrient Criteria

Committee is currently considering how to determine adverse impact with respect to nutrient enrichment. They are considering a definition of adverse impact related to excess nutrients that will be determined at least in part based on DO concentration. Since there is a direct relationship between nutrient concentration and DO concentration the Board would be well served to consider the implications of maintaining the existing minimum concentration DO criterion in light of impending nutrient criteria development in specific watersheds. Adoption of EPA's realistic, yet protective, DO criterion may potentially avoid many future problems such as listing waters for TMDL development that are not in fact nutrient enriched. Accordingly, we strongly urge the Board to adopt EPA's 2002 (Gold Book) DO criterion for protection of aquatic life.

§ 116—pH

Dominion urges the Board not to delete the phrase "higher values due to photosynthesis may be tolerated" that is associated with the pH criterion. Carbon fixation related to natural photosynthetic activity can elevate, under the right conditions, pH values above the 9.0 standard units (s.u). maximum criterion. This natural phenomenon occurs on a regular basis in many WV waters as well as in various wastewater treatment units. Elimination of the provision will likely force operators of waste systems to add biocides for algae control to their process that could be inadvertently spilled or discharged to the state's waters. Moreover, many of the state's waters are poorly buffered and acidified due to acid deposition or acid mine drainage. Therefore the addition of natural carbonate buffering resulting from increased photosynthetic activity would be a benefit to these waters. A common-sense approach for the Board is to maintain this provision and allow the DEP to exercise discretion with respect to enforcing pH excursions above 9.0 that are induced by photosynthesis.

Dominion also urges the Board to give consideration to adding language to the WQS that would allow a site specific exemption or other appropriate relief from the upper pH standard in limited situations where the wastewater treatment or stream restoration practices beneficially causes the pH of a waterbody to exceed 9.0 s.u. For example, the practice of placing lime in a stream to buffer acid mine drainage may cause the pH of a portion of the stream to exceed 9.0 but the overall effect is beneficial to the stream as a whole.

§ 43.a—copper and § 101.a—nickel

There appears to be an error with respect to these two hardness-related criteria. The Board proposes to establish not-to-exceed criterion for both copper and nickel. This is inconsistent with other existing hardness-related criteria such as chromium III and cadmium. Moreover, EPA has clearly shown that the toxicity of copper and nickel to aquatic life is directly related to receiving water hardness, therefore, a not to exceed number for copper and nickel is inappropriate. We suggest that the Board delete the maximum acute and chronic criteria for both copper and nickel and retain the hardness-related criteria.

June 17, 2003

To: West Virginia Environmental Quality Board
1615 Washington East Street, Suite
301Charleston, WV 25311-2128

From: Mark Ehrnschwender
Chair Fayette County Water Quality Coalition
POB 710 Edmond, WV 25837

Re: Review Of Water Standards Rule: Comments Related To Newly Proposed Fecal Coliform Standards

Dear Board:

The FCWQC (Fayette County Water Quality Coalition) is a group of citizens, local government officials, environmental groups, and business leaders who understand the importance of clean water to the health of our county's residents, tourist guests, and over all economy. Our efforts are primarily aimed at an effective wastewater infrastructure to ensure the quality of our most vital resource. Last year we received a $400,000 direct appropriation from Congress, to develop a county wide comprehensive wastewater management plan, along with $2 million in wastewater infrastructure improvements. The FCWQC appreciates the opportunity to comment on these changes. We see three major problems with the proposed standards.

1. The proposed changes require a test for E. coli, if a first test for fecal coliform exceeds the current standard. This E. coli test would have to exceed the EPA recommended standard for E. coli. The problem is the validity of this two test method, due to the time lag between testing. Though each test result is individually valid. Using them as corollaries is not. The conditions producing high fecal coliform may no longer be present (12, 24, 48, ... hours later). So when the E. coli sample is taken it will not reflect conditions and circumstances of the original fecal coliform violation. This gives samplers two opportunities to avoid violation and the discretion to decide when or if to sample the second time.

2. As a result of these new standards it will be difficult to prove all but chronic violations. Therefore the impression will be that water quality has greatly improved when it has not. There will be no incentive to improve water quality through funding wastewater improvement projects since the water quality appears to be "good."

3. Under the current proposal, recreational boating is defined as sail boating and motor boats. Hundreds of thousands of people a year canoe, kayak, and raft, our waters. These forms of recreational boating provide a greater opportunity for exposure to pathogens and to a far greater number of people than does motor boating or sail boating. We ask the board to include kayaking, canoeing, and rafting in the definition of recreational boating.

In summary, we request you reject these new fecal coliform standards and develop a scientifically valid rule that will be a true measure of the Fecal and E. coli relationship.

Sincerely,

Mark Ehrnschwender
Chair Fayette County Water Quality Coalition

WVPRO

West Virginia Professional River Outfitters Association

PRES: DOUG PROCTOR (304) 574-4909 VP: HEATHER JOHNSON (304) 574-2827 SECY.-TREAS: BRIAN CAMPBELL (304) 574-1023

Post Office Box 32 Fayetteville, WV 25840

June 23, 2003

Mr. Ed Snyder, Chair
Environmental Quality Board
1615 Washington St., East
Suite 301
Charleston, West Virginia 25311-2126

RE: TRIENNIAL REVIEW OF WATER QUALITY STANDARDS

REVIEW: COMMENTS RELATED TO THE FECAL COLIFORM STANDARD

Dear Mr. Snyder,

The West Virginia Professional River Outfitters (WVPRO) would like to thank you for the opportunity to comment on the proposed changes to the fecal coliform standards and would like to voice its opposition to these changes. WVPRO is committed to clean water. We have been successful in helping bring wastewater infrastructure improvements to tributaries along the New River. These efforts would insure that our customers and the citizens of West Virginia could continue to enjoy recreating in the pristine waters of the New River for generations to come. The EQB'S proposal would decrease violations without an improvement in water quality and therefore, would remove the incentive to fund needed wastewater improvements.

Two items stand out: (1) Using a single sample for fecal coliform followed by an E.coli test is not possible because the water sample would be too old for accurate testing after the fecal coliform tests are performed. (2) Elevated levels of bacteria from sewage overflows are episodic and therefore, any tests for E.coli, which follow a fecal coliform test with criteria violations, may not reflect similar conditions. This leaves violations undetected and a potential risk to human health as explained to us by the National Park Service.

Fecal coliform is a critically important standard related to public health. A valid bacterial standard is important in protecting all of West Virginia's citizens who use and recreate in our waters.

Please reconsider this provision and promulgate a rule that is protective of public health and scientifically sound.

Sincerely,

Doug Proctor
President

DP/rkj

Paul Burke
P.O. Box 1320
Shepherdstown, WV 25443

304-876-2227 voice & fax
NumbersInstitute@Juno.com



June 23, 2003

Environmental Quality Board
1615 Washington St., E., Suite 301
Charleston, WV 25311

fax 304-558-4116

Honorable Board Members:

These are comments on part of the Turbidity standard in the Water Quality Standards, which are open to comment through today.

> 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~~ Nonpoint Source Management Plan are being utilized, maintained and completed on a site-specific basis ~~as determined by the appropriate 208 cooperative~~ or at which an approved Federal or State Surface Mining Permit is in effect. This exemption shall not apply to Trout Waters.

NAME OF PLAN

There is a big problem, which may be an accident, and would be easy to solve.

The proposed re-wording creates a new and totally unjustified exemption from turbidity standards for construction and urban storm sewers. The new name of the "*Plan*" in is not just a clerical correction. The previous *Plan* did not exist, and therefore exempted no one. The new *Plan* does exist (http://www.epa.gov/reg3wapd/nps/westvirginia.htm), and therefore creates a new and unjustified exemption for construction, storm sewers, and possibly other categories.

Construction and storm sewers are actually point sources (46 CSR 1-2.16 "any discernible, confined and discrete conveyance"). However they are included in the *Nonpoint Source Management Plan*, dated 12/00 and approved by EPA 2/01 and therefore would be exempt from the turbidity rule. This is a hole in the turbidity standards the size of many dump trucks.

As point sources they would normally be covered, but as "activities... in accordance with the... Nonpoint Source Management Plan" they would be exempt.

At least construction, and probably the others, were not exempt under the old language, "*208 Water Quality Management Plan.*" Sworn testimony by Mr. Weaks to the Board on 3/27/03 in my appeal 02-31-EQB said about the construction industry and 208 *Plans*, "*This does not apply now... We created better standards, higher standards, and they've lost their exemption from prosecution.*" Dr. Jenkins confirmed, "*It doesn't apply. That's what I wanted to know.*" (transcript pp. 239-240, attached).

The proposed re-wording brings construction into the exemption, since it is listed in the *Nonpoint Source Management Plan*. It also brings into the exemption any other point source that is in the *Plan*. Construction

is listed on the first page (http://www.epa.gov/reg3wapd/nps/westvirginia.htm). Other questionable topics are listed in the "Management" page (http://www.epa.gov/reg3wapd/nps/wv/pdf/watershedwv.pdf): "sludge land application, basin wide management, hydrologic modification, urban stormwater and septic tank retrofit."

Furthermore the *Plan* is extremely loose, so it offers no protection itself. A very wide range of activities are considered BMPs, including education and stream-side plantings that may not work and thus may have little or no effect on turbidity.

I support the WVRC proposal to remove this exemption entirely, in other words to continue the present situation, which effectively has no exemption, since there are no 208 *Plans*.

MINING EXEMPTION

It is not appropriate to exempt sites with surface mining permits from turbidity standards. Streams with mines, along with people and water treatment plants on these streams, deserve the same protection as other parts of the state.

SIGNIFICANCE OF BOTH EXEMPTIONS

Nowhere else is an entire industry or category of activity exempted from application of a criterion.

This is an extremely important standard, since DEP has said,

> *"By volume, sediment is the number one pollutant in the state's waters and degrades more miles of stream tha[n] any other pollutant."* (Fact Sheet for permit WV0115924).
>
> *"By volume, soil is the largest pollutant source in West Virginia's waterways. Excessive sedimentation in waterways destroys aquatic habitats, increases drinking water costs, and reduces the recreational value of the waters"* (*Nonpoint Source Management Plan*, construction page).

Furthermore there are additional causes of turbidity besides sediment, making the problem even broader.

Extending exemption of turbidity standards to point sources listed in the *Nonpoint Plan* and to permitted surface coal mines places these risks inappropriately on an extensive portion of the state's waters. The exemptions should be removed.

Feel free to call me at the number above if you have any questions.

Sincerely,

Paul Rice

PORTION OF TRANSCRIPT:
Hearing at The Environmental Quality Board
3/27/03 in Appeal 02-31-EQB

Weaks 239

MS. CHARLES: I guess my question is, does this rule apply in the situations we're talking about here?
THE WITNESS: Not anymore.
MS. CHARLES: Not anymore, okay.
THE WITNESS: And it's section 319 that's -- 208 was the '87, and then they modified it in sometime -- I forget. No, actually that was the '82 Clean Water Act. This was written in '82, and that was the -- the 208 program was the original non-point source program, and this was an incentive. The only incentive we had back then before there were storm water permits - because the storm water permit came around in '87 - to induce people to do BMPs, so --
DOCTOR JENKINS: What applies now?
THE WITNESS: Pardon?
DOCTOR JENKINS: What applies now, just the first two parts?
THE WITNESS: Yeah, just the first two parts.
DOCTOR JENKINS: That's on that page?

THE WITNESS: This does not apply now because this is now a point source. It's not expressly exempted now. These all were -- all these projects we were talking about were exempt. We created better standards, higher standards, and they've lost their exemption from prosecution.
MS. CHARLES: Right. Okay, so now they do -- they must

Weaks 240

meet the turbidity -- all the water quality standards is what you're saying? What is it? You're trying to find where it is in the --
MR. LAZELL: Oh, no, I was just looking for my copy of this.
MS. CHARLES: We put it in the exhibits as G.
MR. LAZELL: Oh, this is my copy.
MS. CHARLES: Well, I think it was my copy.
MR. LAZELL: Well that's -- and you can have it back.
MS. CHARLES: You may have inserted it in the notebook at 2-G.
MR. LAZELL: 2-G?
MS. CHARLES: Or not 2-G. Does that cover it, Bob?
DOCTOR JENKINS: It doesn't apply. That's what I wanted to know.
THE WITNESS: As far as we know, it is no longer an non-point source by definition.
MR. ARMBRECHT: Andy, talking about flexibility on the 3600, is 3600 the standard that you use all of the time? You talk about flat land and you talk about mountain ravine. You are still dealing with 3600?
THE WITNESS: Yes, sir.
MR. ARMBRECHT: You don't do any deviating from that, higher?



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

Mr. Ed Snyder, Chair
Environmental Quality Board
1615 Washington St., East, Suite 301
Charleston, WV 25311-2126

June 23, 2003

Dear Mr. Snyder,

West Virginia Rivers Coalition (WVRC) believes that the work the Environmental Quality Board (EQB) does to formulate and promulgate the state's Water Quality Standards (WQS) is an essential component of protecting the rivers and streams of West Virginia. Safeguarding those protections is a mission of WVRC's. Therefore, WVRC has followed the development of the triennial review and is submitting comments on several points of the proposed legislative rule, Requirements Governing Water Quality Standards, upon which WVRC believes change or additional review are necessary to properly protect West Virginia's rivers.

Category A Exemption.
WVRC recognizes that the EQB has invested considerable time addressing the requests by Union Carbide and Weirton Steel to pollute beyond the WQS established for the state. If Weirton Steel had invested as much time negotiating with the City of Weirton over the last six years, they would not need an exemption from public water supply protections (7.2.a.2). WVRC believes extending Weirton Steel's exemption another seven years (until September, 2010) especially in the face of pending bankruptcy, is nearly the same as providing the "permanent" exemption which was arduously objected to by many citizens, organizations, and Department of Environmental Protection (DEP) officials, and ultimately ruled against by the EQB.

It is WVRC's conviction that exemptions from water uses that provide protection to human and aquatic health are not good practice. A more progressive timetable toward a final solution to Weirton's need for exemption is overdue.

Trout Waters.
WVRC acknowledges some logic in moving language pertaining to protections for the Upper Blackwater River from the section relative to numeric WQS exceptions (7.2.c.5) to a section applicable to site specific exceptions (7.2.d.9.1). On the other hand, WVRC does not accept a logical finding in broadening the application of natural condition exceptions to trout streams. The process for reviewing exceptions under this provision (7.2.c.4) requires that the Board "find that the natural condition will fully protect existing and designated uses and ensure the protection of aquatic life." This review should protect our most valuable waters. Yet, maintaining exemption of trout waters to this exception would *insure* protection to a vast body of waters (see Appendix A, Category B-2, Trout Waters), and eliminate any unnecessary extra workload for review by the EQB.

WVRC appreciates the efforts of the EQB, working with staff of DEP and the Division of Natural Resources (DNR), to review and update the list of streams eligible for protections provided trout waters (Appendix A, Category B-2, Trout Waters). This list should be viewed as a working document constantly eligible for enhancement in the form of additions. WVRC recommends that the EQB be receptive to additions throughout the triennial review and revisit the list with DEP and DNR staff at the close of each triennial.

Appendix E, Water Quality Criteria.
The intent of the EQB to "update" West Virginia's numeric criteria for water quality parameters to the Environmental Protection Agency's (EPA's) National Recommended Water Quality Criteria, 2002 is consistent with WVRC's position that standards governing water quality protection in the state be at least as protective as federal guidelines. It should be considered acceptable, even admirable, if West Virginia protects its waters to an even higher standard. After all, West Virginia's streams are exceptional and deserve protections greater than a national baseline.

The "New Pollutants Added to WQS Rule" list and Table 1, "Comparison Chart for appendix E of WQS" move West Virginia's parameters to EPA's level of protection with a few exceptions. Two of those parameters, fecal coliform and turbidity are discussed in greater detail in the following paragraphs. Several other parameters including, aluminum, iron, manganese and selenium await EPA review. WVRC recommends that updating the numeric criteria for water quality parameters becomes a periodic practice of the EQB and that the effort continue to be approached with the philosophy of at least meeting federal levels of protections for West Virginia's waters.

Fecal Coliform/E-Coli.
WVRC understands the complexity of issues surrounding the criterion fecal coliform (8.13) and EPA's preference for an e-coli standard based upon their "Ambient Water Quality Criteria for Bacteria—1986". The quality of test results for each parameter and associated costs vary. The parameters are applied for Primary Contact Recreation in a state where recreational contact is a part of its largest growing economic industry, tourism, and in a state which faces enormous infrastructure development challenges from straight piping to Combined Sewer Overflow (CSO) failures. Therefore, protections for primary contact recreation are amongst the most important parameter changes facing the EQB's review.

Review should first consider that West Virginia's WQS do a poor job of defining Primary Contact Recreation. The definition appears to be defined by Category C—Water contact recreation (6.4) which states, "This category includes swimming, fishing, water skiing and certain types of pleasure boating such as sailing in very small craft and outboard motor boats." Although all of those activities may occur in West Virginia, they do not fully recognize water contact typically encountered by someone recreating in a mountainous state. Whitewater paddlers, fly and float fishermen are subjected to more contact than most sailors or motor boaters. Hikers, campers and hunters ford streams and use stream water to drink and wash. WVRC suggests that a first step toward fecal coliform parameter review is a review of the definition of Primary Contact Recreation.

We must accept that the fecal coliform standard is becoming outdated and frequently does a poor job of correlating with human disease. On the surface, the EQB made a small step in the right direction by offering an e-coli standard to back-up any fecal

coliform violation. In reality, that proposal completely escapes any effort to have standards which provide protection at levels at least as protective as EPA's. WVRC asserts that this parameter should be very protective for the simple reason that West Virginia's tourism economy rests heavily on good water quality and a strong economy is necessary to resolve the magnitude of infrastructure problems throughout the state.

There are two principle loopholes in the EQB's proposal. 1) Using a single sample for fecal coliform testing followed by an e-coli test is not possible because the sample would be too old for viable e-coli testing after fecal coliform results are returned. The sample would need to be split and tested simultaneously for both parameters. 2) Elevated bacteria is very episodic and therefore any tests for e-coli which follow a fecal coliform test with criteria violations may not reflect similar conditions. Sewage by-passes are often storm related and may only last hours, but many plumes have been documented to carry fecal coliform levels in the tens of thousands. A test that violates fecal coliform levels, under the proposed rule would then be subjected to e-coli parameters. Yet, because the window of opportunity to sample has changed, the e-coli sample may show no violation. This problem leaves a violation effectively undetected, and therefore a serious human health problem unresolved or at least deferred until the next testing cycle.

Testing on the New River indicates that fecal coliform and e-coli tests reflect similar magnitudes of violations. WVRC recommends that the EQB abandon its present proposal for sequential testing. One consideration would be incorporating a move to both tests over a period of five years. A five year transition will 1) provide a learning curve for those using the tests, 2) allow the additional cost of e-coli testing to be spread out over time, 3) develop a history of data which would provide comparative data and help deal with the concerns of how to approach TMDL clean-ups based upon fecal coliform records, and 4) move to a standard which provides insurance of protections for Primary Contact Recreation in West Virginia.

Turbidity.
WVRC believes it is inappropriate to exempt from turbidity standards (Appendix E, 8.32.1) non-point sources exercising Best Management Practices (BMPs) and sites with surface mining permits. First, the character of the exemption is inconsistent with language throughout West Virginia WQS. No where else is an entire industry or category of activity exempted from application of a criterion.

Second, during the recent months of triennial review, some comments by the EQB deferred to the coal, timber and agricultural industries' measure of protection from turbidity to other agency reviews or regulatory measures. West Virginia WQSs should be a stand alone document through which the best protections are provided all of the state's waters. Review, regulation and protection by those issuing coal permits for instance, should be based upon the foundation of the state's WQS, not the other way around.

Finally, excessive turbidity and the resulting sedimentation in streams should be recognized as a broad reaching problem which can impair aquatic life, interfere with municipal and other drinking water supplies, affect recreational enjoyment and alter stream channel shapes to the point of contributing to flooding characteristics. The March, 2003 West Virginia Flood Protection Plan (West Virginia Flood Protection Task Force sponsored by WV Conservation Agency and U.S. Army Corps of Engineers)

points to coal, timber and other non-point activities as a significant source of sedimentation. Extending exemption of turbidity standards to non-point activities and permitted surface coal mines places inherent risks on an extensive portion of the state's waters. WVRC believes those risks are not warranted.

Additional Concerns.
The following two points are not proposed as changes for review in the proposed legislative rule, Requirements Governing Water Quality Standards. Nonetheless, they merit some discussion. The first, the use of harmonic mean flow for carcinogenic criteria, was introduced for discussion by industry and manufacturing representatives at the June 18, 2003 public hearing. The second, the incorporation of ditches into the definition of wet weather streams, was introduced in DEP's September 24, 2002 comment letter, but never fully discussed by the EQB.

Harmonic Mean Flow v. 7Q10.
Considerable time has been spent on this issue by the EQB, and several opportunities for public participation at EQB meetings have occurred since the beginning of 2002. Specifically, public input was requested and time set aside for public comment at the May 8, 2003 meeting. The purpose of the discussion was to evaluate interest in changing design flow methods within the context of the 2004 legislative rule for water quality standards. The conclusion was not to include a proposal for change. The conclusion was based upon testimony by many experts and the need for more detailed study. *Notably, this need was expressed in a letter from Governor Wise and presented by Secretary Timmermeyer, head of the agency that initially introduced the issue for discussion in 2002.*

WVRC presents its assertions again:

- The harmonic mean flow issue should not be considered in isolation, without considering changes to other design flows as recommended by EPA, including 1Q10 for acute aquatic life.
- Switching to harmonic mean flow will result in larger discharges into our waters of cancer causing substances available for human contact.
- The Clean Water Act requires reductions, not increases, in pollution loads.
- If larger loads of human carcinogens are to be permitted in our streams, considerable study must first be undertaken to ascertain (1) which receiving streams will receive these increased loads, (2) what increased loads of what carcinogens will be permitted for each receiving stream, and (3) how these increased loads will affect human health, considering that limits on multiple carcinogens are likely to be weakened at the same time. Without such knowledge, permits will simply be weakened without understanding the implications for people's health.

Weakening West Virginia's criteria for human carcinogens by 2-3 times, as proposed at the public hearing by Joyce McCune Gentry, consultant for the Chamber of Commerce, would be an illegal lowering of state standards. The criteria recommended by EPA are based on certain accepted risk factors, and cannot be lowered without sound scientific justifications. These justifications simply do not exist at this time.

Please reference comments by WVRC to the EQB dated February 19, 2003, April 10, 2003, and May 7, 2003 for more detailed consideration is warranted at this time.

Wet Weather Streams.
This concern of DEP's was "tabled" by the EQB for a variety of time constraint reasons. The principle point of discussion surrounds an enforcement scenario encountered by the agency. Further consideration should be given to broadening the definition of wet weather streams to include ditches and to include a groundwater parameter to the protections allotted in the numeric water quality standard exception for wet weather streams (7.2.c.2).

WVRC applauds the magnitude of work set forth by the EQB in the proposed Requirements Governing Water Quality Standards. The process of triennial review is a large effort and is critical to the continuing protection of our rivers and streams. Our concerns with this body of work have been detailed throughout this letter. There is not adequate time to recognize the simple things that raise no objection, yet elevate the protections of West Virginia's waters subetantially, such as removing exemptions of Category A and E protections for the Youghigheny River. WVRC asks that the EQB continue its diligent efforts and make corrections as necessary to address the array of issues surrounding the items discussed above and listed here: continuing Category A exemptions for Weirton Steel, trout water protections, bacteria testing, turbidity criteria exemptions and receiving water body definitions.

Thank you for the opportunity to present comments. As the EQB addresses our concerns, please contact WVRC with any questions.

Sincerely,

Liz Garland, Issues Coordinator

WEST VIRGINIA HOSPITALITY & TRAVEL ASSOCIATION

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RECEIVED
JUN 23 2003
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

June 23, 2003

West Virginia Environmental Quality Board
1615 Washington Street, East, Suite 301
Charleston, WV 25311-2126

Subject: Comments on Proposed Changes to the Requirements Governing Water Quality Standards, dated May 19, 2003 (proposed legislative rule)

Members of the Environmental Quality Board:

The West Virginia Hospitality and Travel Association has grave concerns about a number of issues regarding the proposed water quality standards rule changes, as announced by your public notice dated May 19, 2003. As a result of our review, we believe that the only logical and supportable course of action for the Board is to withdraw the rules as proposed in their entirety.

Changes which are determined to be needed and justified following substantial further review should then be re-proposed along with adequate information regarding the technical justification for each change, the projected impact and cost burden each change will impose on affected parties and on the state, and a discussion of the technical and public policy considerations which in the Board's opinion support each proposed change.

The changes proposed by your filing on May 19th are so extensive in scope as to defy understanding by the layman. Our members and therefore our organization are generally not geared to deal with many of the highly technical issues raised by the standards changes you have proposed, but we have had the benefit of discussing the changes with members of the West Virginia Chamber of Commerce's environmental committee, and we are aware of several comments you have received (at the public hearing) or will receive from or on behalf of the Chamber. We endorse and support those comments made by or on behalf of the Chamber, including the technical issues raised in those comments, and also including the call for you to withdraw the rules as proposed.

We are concerned about many specific aspects of and impacts of the proposed changes. The first concern is the cost these changes will impose on affected parties, coupled with the fact that something in this proposal will almost certainly affect virtually every discharger within the state. We understand the increased analytical costs alone for dischargers would be enormous, and the state would obviously incur major increased costs in its administration of the rules as well as in its own analytical work. There will

also be cost effects, sometimes indirect but definitely sometimes direct, upon owners of land whose activities include no point source discharge.

Considering the extent and number of the proposed changes, we are amazed that the Fiscal Note accompanying the public notice claimed, with regard to the economic impact of the rules, "None anticipated". With all due respect we submit that if the Board actually believes these massive changes will have no economic impact, the Board is surely inadequately informed as to the impacts of the rules. This rule should, and by our understanding of state law must, be accompanied by a meaningful analysis of its economic impacts, and failure to either consider or to accurately describe those economic impacts is alone adequate justification for withdrawal of the rule until such analysis is completed for each proposed change.

Other technical problems we have with the proposed rules include the following, each of which has been addressed in greater detail in the Chamber of Commerce comments mentioned above:

- Misapplication of primary drinking water standards to stream quality, including proposing to apply end of tap potable treated water standards to stream quality;
- Proposed stream quality standards at levels far below (even orders of magnitude below) the minimum detection limits for many parameters, which will cause greatly increased analytical costs and which will also set up impossible compliance and enforcement scenarios;
- Proposals to adopt stream quality standards which have no known actual or potential applicability to West Virginia, and which West Virginia is therefore not required to adopt; and
- A number of errors in the rules which have been detected and commented on by others, along with the great likelihood that many more errors may have gone undetected in the very short time allowed by the Board for review and comment.

On a public policy matter, we believe it is the Board's duty to fully and accurately inform the legislature, the public, and affected parties as to the impacts of a proposed rule change. The short public notice and comment period provided for this rule, coupled with the limited technical explanation, fell far short of fulfilling this duty. The fiscal note added to the problem by its misleading and totally inaccurate "no economic impact" claims.

On another specific matter which cuts across both public policy and technical accuracy, we object strenuously to the Board's addition of over 420 streams or stream segments to the list at Appendix A of "Category B-2 – Trout Waters". While we have not had the time to compare each entry in your proposed list to the "trout stream" list which accompanied the 2001 "Antidegradation Rules", a quick review shows that many if not all of the proposed Category B-2 list additions are the same as and (we assume) apparently came from the same sources as the antidegradation rule list. As with the

antidegradation rules, your proposed rule offers no data, evidence, or technical support for declaring these streams to be trout waters. The antidegradation rule list of trout streams (Tier 2.5 streams) is still in the midst of a review and objection process which will undoubtedly be followed in many instances by appeals of decisions regarding the status of these "trout streams". Finally, the categorization of these streams must go before the legislature again before their status is finalized, and that legislative review will apparently not take place for some time.

One reason but by no means the only reason for objections to some of the streams being categorized as trout streams (and therefore Tier 2.5) is that a number of them are not in fact capable of sustaining year round trout populations, as required by your rule at 2.20. Considering the ongoing heated controversy over the inclusion of some four hundred streams as "trout waters" and therefore Tier 2.5 in the antidegradation rules, it is very surprising that the Board has proposed to list these same streams as trout waters, still without providing any justification or supporting data. Whatever decision the Board makes regarding the overall rule as proposed on May 19th, we request that all of the proposed additions to the Category B-2 list be removed and reconsidered only once the current process involving public, legislative, and even judicial review is completed, whenever that may be.

Our organization supports clean water, clean streams, and a clean environment. However, we cannot and do not support the massive revisions to the Water Quality Standards rules as proposed on May 19, 2003. To reiterate, we request that the proposed rules be withdrawn.

Thank you for the opportunity to provide these comments.

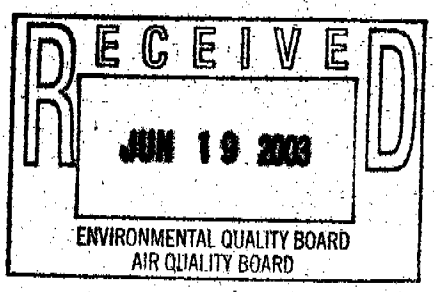
Sincerely Yours,



Carol S. Fulks
Executive Director

"To restore, preserve, and promote the outstanding natural qualities of the Cheat River Watershed."





Mr. Ed Snyder, Chair
Environmental Quality Board
1615 Washington St., East, Suite 301
Charleston, WV 25311-2126

June 23, 2003

Dear Mr. Snyder,

As our mission statement implies, Friends of the Cheat (FOC) is vitally concerned with water quality in the Cheat River Watershed. This watershed encompasses a range of water quality from reproducing brook trout streams to streams rendered essentially lifeless by acid coal mine drainage. We believe that the work the Environmental Quality Board (EQB) does regarding the state's Water Quality Standards (WQS) is an essential component of protecting the rivers and streams of West Virginia. West Virginia's rivers and streams are important to FOC because of the direct impact the quality of these waterways have on health, quality of life, economic development and recreational opportunities. Therefore, we welcome the opportunity to provide comment on the following sections of the proposed Requirements Governing Water Quality Standards which need improvement in order to best protect our waters.

1. Appendix A, Category B-2, Trout Waters

The efforts of the EQB, in concert with staff of DEP and the Division of Natural Resources (DNR), to review and update the list of streams eligible for protections provided trout waters (Appendix A, Category B-2, Trout Waters) is commendable. This list should be viewed as a working document. The EQB should remain receptive to additions throughout the triennial and revisit the list with DEP and DNR staff at the close of each triennial.

2. Section 46-1-7.2.a.2, Public Water Supply Exemption for Weirton Steel Corporation

Extending Weirton Steel's exemption another seven years (until September, 2010) is nearly the same as providing the "permanent" exemption which was objected to by many citizens, organizations and Department of Environmental Protection (DEP) officials, and ruled against by the EQB. Exemptions from water uses that provided protection to human and aquatic health are not good practice. A more progressive timetable toward a final solution to Weirton's need for exemption is overdue.

Phone: 304/329-3621 • Fax: 304/329-3622 • Email: foc@cheat.org • www.cheat.org

3. Appendix E, Water Quality Criteria

Updating West Virginia's numeric criteria for water quality parameters to the Environmental Protection Agency's (EPA's) National Recommended Water Quality Criteria, 2002 is an important process to insure that the state provide standards at least as protective as federal guidelines.
West Virginia should protect its waters to the highest standard. It is recommended that updating the numeric criteria for water quality parameters become a periodic practice of the EQB and that the effort continue to be approached with the philosophy of at least meeting federal levels of protections for West Virginia's waters.

4. Fecal Coliform/E-Coli.

Fecal coliform parameters are applied for Primary Contact Recreation West Virginia where recreational contact is a part of its largest growing economic industry, tourism, and in a state which faces enormous infrastructure development challenges from straight piping to Combined Sewer Overflow (CSO) failures. Therefore, protections for primary contact recreation are amongst the most important parameter changes within the EQB's review.

There are two key loopholes in the EQB's proposal. 1) Using a single sample for fecal coliform testing followed by an e-coli test is not possible because the water sample would be too old for viable e-coli testing after fecal coliform results are returned. The sample would need to be split and tested simultaneously for both parameters. 2) Elevated bacteria are very episodic and therefore any tests for e-coli which follow a fecal coliform test with criteria violations may not reflect similar conditions. This problem leaves a violation effectively undetected and, therefore a serious human health problem unresolved or at least deferred until the next testing cycle.

It is recommended that the EQB abandon its present proposal for sequential testing to a proposal incorporating a move to both tests over a period of three to five years. A transition will 1) allow the additional cost of e-coli testing to be spread out over time, 2) develop a history of data which would provide comparative data and help deal with the concerns of how to approach TMDL clean-ups based upon fecal coliform records, 3) provide for a timeframe for learning new testing procedures, and 4) move to a standard which provides insurance of protections for Primary Contact Recreation in West Virginia.

"To restore, preserve, and promote the outstanding natural qualities of the Cheat River Watershed."

Friends of the Cheat

5. Turbidity

It is inappropriate to exempt from turbidity standards (Appendix E, 8.32.1) non-point sources exercising Best Management Practices (BMPs) and sites with surface mining permits. No where else is an entire industry or category of activity exempted from application of a criterion. And, excessive turbidity and the resulting sedimentation in streams carry considerable problems such as, impairing aquatic life, interfering with municipal and other drinking water supplies, affecting recreational enjoyment and altering stream channel shapes to the point of contributing to flooding. Extending exemption of turbidity standards to non-point activities and permitted surface coal mines places these risks inappropriately on an extensive portion of the state's waters. The exemptions should be removed.

Thank you for the opportunity to present comments. The effort of the EQB to address these concerns for the benefit of our waters is appreciated.

Sincerely,

Keith Pitzer
Director
Friends of the Cheat

Phone: 304/329-3621 • Fax: 304/329-3622 • Email: foc@cheat.org • www.cheat.org

AQBEQB CLERK - Comments for Triennial Review

From: "Steve White" <stevewhite@actwv.org>
To: <clerk@aqbeqb.state.wv.us>
Date: 6/23/2003 3:45 PM
Subject: Comments for Triennial Review

To: EQB
From: Steve White, ACT Foundation
RE: Comments on 7Q10 - Harmonic Mean Flow
Date: June 23, 2003

Please accept these attached comments regarding both a suggested course of study for reviewing the present 7Q10 method of measuring water flow as compared to the less stringent Harmonic Mean flow method and why we oppose the change from 7Q10 to Harmonic Mean Flow which would allow more cancer causing chemicals to be discharged into our rivers and streams.

Thank You.

Steve White, Director
Affiliated Construction Trades Foundation
600 Leon Sullivan Way
Charleston, WV 25301
345-7570

Suggested Areas of Study On The Proposed Changes To The Water Quality Standards Rule
Prepared by Carpenter Environmental Associates, Inc.
On behalf of the Affiliated Construction Trade Foundation

The West Virginia Department of Environmental Protection Division of Water Resources in a letter dated September 24, 2002 has recommended that changes be made to Section 7.2.b of the Water Quality Standards Rule 46-CSR-1 regarding the design flow used to determine compliance with water quality standards. Specifically, the DWR has stated that the following should be added to Section 7.2.b :"except that application of harmonic mean flow in the development of effluent limitations for Human Health Category "A" criteria for carcinogens. During a meeting on this issue, it was decided that a study plan should be developed to determine the impacts of the proposed change. The following are issues which we believe must be included in the study.

1. **Determination of Need for Revisions to Critical Design Flow for Human Health Carcinogens**

The West Virginia regulations currently require that the 7Q10 flow be utilized when determining appropriate discharge limitations for pollutants considered human health carcinogens. A review and evaluation of the compliance history of all facilities that currently have permit limitations for carcinogenic pollutants in their National Pollutant Discharge Elimination System (NPDES) permits must be conducted. This evaluation must include a determination of the number of existing dischargers that are currently unable to consistently meet their permit limits for carcinogenic pollutants and the reasons why the permit limits cannot be met.

2. **Determination of Health Impacts**

The use of harmonic mean flow as the design flow for carcinogens substances is based upon the assumption that the linear lifetime exposure model for carcinogens is correct for all cancer causing substances. While the use of the linear lifetime exposure model for cancer may in many cases be conservative, we believe that applying such an assumption across-the-board for all cancer causing substances fails to account for valid alternative models for cancer such as the threshold model. A review of the scientific literature must be conducted to determine for which carcinogens the linear lifetime exposure model for carcinogens is correct and for which carcinogens a threshold model is more appropriate.

The study must include a determination of the number of increased cancer cases likely in West Virginia as a result of the change from 7Q10 to harmonic mean flow. This study should take into account both increased cancer cases associated with carcinogens that follow the linear lifetime exposure model and the non-linear threshold model. We have determined that revising the critical design flow would allow, for just three rivers, the Ohio, the Kanawha, and the Greenbriar, the rule as proposed would allow, respectively, the discharge of 7.4, 5.4, and 7.8 times as much cancer causing substances as is currently allowed, which would equate to people being exposed five to eight times as much cancer causing substances. The study must evaluate whether this increase would result in a concomitant increase in cancer cases for carcinogens that follow both the linear lifetime exposure model and the non-linear threshold model.

3. Determination of the Economic Impact of Revising the Critical Design Flow

a. Realized savings for new and existing dischargers: This analysis must include a determination of the cost associated with meeting discharge limits associated with the 7Q10 flow and harmonic mean flow.
b. Impacts to economic growth in West Virginia: A study must be conducted to determine if the current requirement of 7Q10 flow has resulted in industries not locating in West Virginia because they were unable to meet discharge permit requirements because the cost would be prohibitive to doing business.

c. Economic impacts of increased cancer cases in West Virginia: This evaluation must take into account the expected increase in cancer cases due to the proposed change and the expected associated costs: health care costs as well as lost earnings associated with removing cancer stricken individuals from the work force.

ATTACHMENT 1: CALCULATION OF HARMONIC MEAN FLOW

Carpenter Environmental Associates, Inc. has carried out the study described below to determine the effect of the proposed rule change to allow the use of harmonic mean flow as the design flow for wasteload allocation for carcinogens.

Utilizing the harmonic mean flow would represent a change from West Virginia's usual method of wasteload allocation which uses the 7 day mean low flow with a 10 year return period (7Q10) expected in a river as the critical design criteria. Use of the harmonic mean flow rather than 7Q10 flow as the critical design flow would result in an increase in the amount of carcinogens that would be allowed to be discharged the waters of West Virginia. The amount of the allowable increase can be estimated by comparing the harmonic mean flow of a river, or river segment, to the low flow.

Carpenter Environmental Associates, Inc. (CEA) has developed the harmonic mean flow (Q_h) for locations on three rivers in West Virginia. These rivers are the Ohio, Kanawha, and the Greenbrier. These rivers were selected due to their size (large, medium and small, respectively) and nature (controlled or uncontrolled). Daily stream flow data for the available periods for record were obtained from the United States Geological Survey (USGS) website for the Kanawha and Greenbrier. Data for the Ohio River was obtained by CEA from the USGS in 1991. No additional data on daily flows was available for the Ohio River. To calculate the harmonic mean flow, the total number of record flows (N) was divided by the summation of each daily flow (1/Q). The harmonic mean flow was calculated as follows:

$$Q_h = N / (\sum 1/Q)$$

Q_h = harmonic mean flow
N = Total number of recorded daily flows
1/Q = Inverse of daily flow

The 7Q10 flows were obtained from the USGS Water Resources Division in West Virginia. The 7Q10's for the gaging stations of interest are as follows: Ohio River at Huntington – 4,500 cubic feet per second (CFS) (estimated), Kanawha River at Charleston – 1,250 CFS (estimated), and the Greenbrier River at Hilldale – 55 CFS. Due to the regulation of the Ohio and Kanawha Rivers by locks and dams, there are only estimated design 7Q10's available. CEA was informed by the USGS that these estimated 7Q10's are currently appropriate to use as the critical design flow.

The following table compares the calculated harmonic mean flows to the 7Q10 flows.

River	Station Name	USGS #	Period of Record (yrs)	Harmonic Mean Flow (cfs)	7Q10 (cfs)	Harmonic Mean Flow/ 7Q10 Ratio
Ohio	Huntington	03206000	53	33,367	4,500	7.4
Kanawha	Charleston	03198000	61	6,781	1,250	5.4
Greenbrier	Hilldale	03184000	64	416	55	7.6

Each ratio developed above represents the factor by which the quantity of carcinogens discharged to West Virginia's wasters will be increased if the harmonic mean flow is used as the design flow rather than the 7Q10. Changing the regulations from 7Q10 to harmonic mean flow would result in allowing 5.4 to 7.6 times more carcinogens being discharged in the river segments studied. Similar analyses must be performed for other river segments in West Virginia to determine the factor by which allowable discharges of carcinogens would be increased in each river.

Based on the limited analyses performed, the proposed change to using the harmonic mean flow as the critical design flow for determining wasteload allocations will result in significant increases in the amounts of carcinogens that are allowed to be discharged to West Virginia waters. These increased discharges will result in increased cancer risks, the magnitude of which depends upon the particular carcinogen. For some carcinogens, the impact of the proposed rule change on risk of cancer may be small, for others the increase in risk may be many times the increase in discharge amount. Given these conclusions, it is prudent and appropriate that the West Virginia State Water Resources Board determine the increased quantities of carcinogens the proposed rule would allow to be discharged to all river segments in West Virginia and determine the increased cancer risk to West Virginia's citizens these discharges would represent for each carcinogen.

Comments On The Proposed Changes To The Water Quality Standards Rule
Prepared by Carpenter Environmental Associates, Inc.
On behalf of the Affiliated Construction Trade Foundation

The West Virginia Department of Environmental Protection Division of Water Resources in a letter dated September 24, 2002 has recommended that changes be made to Section 7.2.b of the Water Quality Standards Rule 46-CSR-1 regarding the design flow used to determine compliance with water quality standards. Specifically, the DWR has stated that the following should be added to Section 7.2.b :"except that application of harmonic mean flow in the development of effluent limitations for Human Health Category "A" criteria for carcinogens and the use of other hydrologically based design flow periods for determining appropriate effluent limitations to reflect representative exposure frequencies and durations for Category "B" criteria shall be performed consistent with the guidance offered in EPA's Technical Support Document for Water Quality based Toxics Control (TSD)". Or in the alternative, the DWR recommends adding a new section regarding the applicability of the use of alternative design flows for developing effluent limitations for Human Health and Aquatic Life Criteria based upon the guidance provided in the TSD. We disagree with the DWR proposed change to allow Harmonic Mean Flow to be the critical design flow for determining the amount of a carcinogen an industry can legally discharge to the State's waters. We also believe that the design flows should be specifically stated in the regulations.

Critical Design Flow For Human Health Carcinogens

We believe that adoption of the harmonic mean flow as the critical design flow for carcinogens is inappropriate for at least two reasons. First, the State has not

adequately investigated the impact on all the streams of West Virginia of abandoning the use of a low design flow, such as the 7Q10, in favor of the harmonic mean flow. For example, for just three rivers, the Ohio, the Kanawha, and the Greenbriar, the rule as proposed would allow, respectively, the discharge of 7.4, 5.4, and 7.8 times as much cancer causing substances as is currently permitted (See Attachment 1). The effect of the rule change on our rivers has not been determined. However, the harmonic mean flow is always greater than the 7Q10 for a particular stream, so that, the adoption of the harmonic mean flow as the critical design flow necessarily results in an increase in the amount of cancer causing chemicals allowed in all rivers and streams. The State must determine the magnitude of the increase in each river and stream in order to make a fully informed decision.

Second, the rationale for embracing harmonic mean flow as the critical design flow is based upon the assumption that the linear lifetime exposure model for carcinogens is correct for all cancer causing substances (see Rationale Document, Water Resources Board of West Virginia, August 19, 1991). While the use of the linear lifetime exposure model for cancer may in many cases be conservative, we believe that applying such an assumption across-the-board for all cancer causing substances fails to account for valid alternative models for cancer. As developed in the accompanying report to these comments (Attachment 2), which was prepared for the specific purpose of providing information about valid alternative cancer models, there are "a number of circumstances in which a linear model may not be appropriate in that it may underestimate actual risk." In such circumstances, low flow conditions, rather than harmonic mean conditions, can be the critical factor in determining whether an individual is exposed at a level that

results in an acceptable cancer risk. Further, the report concludes that in non-linear models, cancer risk can increase sharply at low doses, so that, "the actual risk entailed by changing to Harmonic Mean Flow may increase by far more than 8-fold." (As stated earlier, a very limited, simple comparison of 7Q10 to harmonic mean flow for the rivers investigated showed that as much as 8 times more carcinogens could be discharged). Establishing the harmonic mean flow as design flow rather than the 7Q10 would allow polluters to discharge up to 8 times (and perhaps more as would be determined in needed investigations) more cancer causing substances to West Virginia's rivers and streams and would increase cancer risk. The increased cancer risk which would result by establishing harmonic mean flow as the design flow can and must be determined before allowing such a change. Therefore, we believe that the use of harmonic mean flow as the critical stream flow for carcinogens should not be allowed until it is fully investigated and the legislature determines that the increased cancer risk to the citizens of West Virginia is acceptable.

Critical Design Flow for Aquatic Life Criteria and Non-Carcinogenic Human Health Criteria

The Division of Water Resources has proposed that the regulations at Section 7.2.b be revised to include the following language "the use of other hydrologically based design flow periods for determining appropriate effluent limitations to reflect representative exposure frequencies and durations for Category "B" criteria shall be

performed consistent with the guidance offered in EPA's Technical Support Document for Water Quality based Toxics Control (TSD)". Or in the alternative, the DWR recommends adding a new section regarding the applicability of the use of alternative design flows for developing effluent limitations for Human Health and Aquatic Life Criteria based upon the guidance provided in the TSD. The EPA toxic support document recommends the 1Q10 for acute aquatic life criteria and the 7Q10 for chronic aquatic life criteria and 30Q5 for non-carcinogenic human health criteria. Rather than providing a vague reference to EPA's guidance manual, the regulations should provide explicit requirements for the design flows to avoid inconsistencies or confusion when developing permit limitations.

EPA's recommendations would result in a more stringent design flow for acute criteria for aquatic life (1Q10 rather than 7Q10), the same design flow for chronic criteria for aquatic life (7Q10) and a less stringent design flow for non-carcinogenic human health criteria (30Q10 rather than 7Q10). Prior to changing the design flow for non-carcinogenic human health criteria from 7Q10 to 30Q10, an analysis must be conducted to evaluate the increased health risk to citizens of West Virginia of allowing increased levels of non-carcinogenic toxic pollutants to be discharged to the waters of West Virginia and the legislature must determine that the increased health risk is acceptable. This evaluation must take into account that the neighboring states of Kentucky and Pennsylvania both utilize the 7Q10 flow to determine discharge limitations for these pollutants.

304-558-4116

Mr. Ed Snyder, Chair
Environmental Quality Board
1615 Washington St., East, Suite 301
Charleston, WV 25311-2126

June 20, 2003

Dear Mr. Snyder,

My name is Cliff Wire, and I am a member of Keel-Haulers Canoe Club out of Cleveland, Oh.

I believe that the work the Environmental Quality Board (EQB) does regarding the state's Water Quality Standards (WQS) is an essential component of protecting the rivers and streams of West Virginia. West Virginia's rivers and streams are important to me because I am an avid kayaker on WV waters and drink WV water. Overall, I would have to say I spend over a quarter of my weekends camping in WV.. Therefore, I welcome the opportunity to provide comment on the following sections of the proposed Requirements Governing Water Quality Standards which need improvement in order to best protect our waters.

1. Appendix A, Category B-2, Trout Waters

The efforts of the EQB, in concert with staff of DEP and the Division of Natural Resources (DNR), to review and update the list of streams eligible for protections provided trout waters (Appendix A, Category B-2, Trout Waters) is commendable. This list should be viewed as a working document. The EQB should remain receptive to additions throughout the triennial and revisit the list with DEP and DNR staff at the close of each triennial.

2. Section 46-1-7.2.a.2, Public Water Supply Exemption for Weirton Steel Corporation

Extending Weirton Steel's exemption another seven years (until September, 2010) is nearly the same as providing the "permanent" exemption which was objected to by many citizens, organizations and Department of Environmental Protection (DEP) officials, and ruled against by the EQB. Exemptions from water uses that provided protection to human and aquatic health are not good practice... A more progressive timetable toward a final solution to Weirton's need for exemption is overdue.

3. Appendix E, Water Quality Criteria

Updating West Virginia's numeric criteria for water quality parameters to the Environmental Protection Agency's (EPA's) National Recommended Water Quality Criteria, 2002 is an important process to insure that the state provide standards at least as protective as federal guidelines. West Virginia should protect its waters to the highest standard. It is recommended that updating the numeric criteria for water quality parameters become a periodic practice of the EQB and that the effort continue to be approached with the philosophy of at least meeting federal levels of protections for West Virginia's waters.

4. Fecal Coliform/E-Coli.

Fecal coliform parameters are applied for Primary Contact Recreation West Virginia where recreational contact is a part of its largest growing economic industry, tourism, and in a state which faces enormous infrastructure development challenges from straight piping to Combined Sewer Overflow (CSO) failures. Therefore, protections for primary contact recreation are amongst the most important parameter changes within the EQB's review.

There are two key loopholes in the EQB's proposal. 1) Using a single sample for fecal coliform testing followed by an e-coli test is not possible because the water sample would be too old for viable e-coli testing after fecal coliform results are returned. The sample would need to be split and tested simultaneously for both parameters. 2) Elevated bacteria are very episodic and therefore any tests for e-coli which follow a fecal coliform test with criteria violations may not reflect similar conditions. This problem leaves a violation effectively undetected and, therefore a serious human health problem unresolved or at least deferred until the next testing cycle.

It is recommended that the EQB abandon its present proposal for sequential testing to a proposal incorporating a move to both tests over a period of three to five years. A transition will 1) allow the additional cost of e-coli testing to be spread out over time, 2) develop a history of data which would provide comparative data and help deal with the concerns of how to approach TMDL clean-ups based upon fecal coliform records, 3) provide for a timeframe for learning new testing procedures, and 4) move to a standard which provides insurance of protections for Primary Contact Recreation in West Virginia.

5. Turbidity

It is inappropriate to exempt from turbidity standards (Appendix E, 8.32.1) non-point sources exercising Best Management Practices (BMPs) and sites with surface mining permits. No where else is an entire industry or category of activity exempted from application of a criterion. And, excessive turbidity and the resulting sedimentation in streams carry considerable problems such as, impairing aquatic life, interfering with municipal and other drinking water supplies, affecting recreational enjoyment and altering stream channel shapes to the point of contributing to flooding. Extending exemption of turbidity standards to non-point activities and permitted surface coal mines places these risks inappropriately on an extensive portion of the state's waters. The exemptions should be removed.

Thank you for the opportunity to present comments. The effort of the EQB to address these concerns for the benefit of our waters is appreciated.

Sincerely,

Cliff Wire
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Bedford, OH 44146
440-439-6541
clfwire@aol.com

Cliff Wire

LEAGUE OF WOMEN VOTERS OF WEST VIRGINIA

RECEIVED
JUN 23 2003
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

June 19, 2003

West Virginia Environmental Quality Board
1615 Washington Street East, Suite 301
Charleston, WV 25311-2126

Dear Board Members,

The League of Women Voters of West Virginia wishes to make some comments on the Environmental Quality Board's Triennial Review.

As we stated in September we urge the Environmental Quality Board to delete the mining industry's exceptions to turbidity standards. Turbidity is more than an aesthetic problem. High turbidity indicates that there are unacceptable amounts of sediments in the water. Harmful organisms attach themselves to suspended particles. Sedimentation increases the costs for cleaning up our waters for personal and public use.

Because high turbidity reduces the amount of light that can pass through water, aquatic plants will not grow adequately. This reduction in growth decreases the amount of oxygen in our waters and the availability of food and places to live for fish and invertebrates. Further reduction in oxygen comes from the water temperature increases in turbid waters.

Sediments indicated by turbidity affect fish and invertebrates' ability to feed and breathe. Because many aquatic invertebrates are filter feeders, they become choked by sediments. Likewise fish gills become clogged. The result is less resistance to disease and lower growth rates. Sediments also smother fish eggs.

Furthermore buildup of sediments indicated by turbidity increases the likelihood of flooding.

We are pleased that the Environmental Quality Board is asking for comments on bioaccumulation. We believe it is in the best interests of the state and its people for bioaccumulation to be a factor for regulations.

The Great Lakes Initiative has carried out considerable studies on toxic chemicals accumulating up the food chain and their bio accumulative effects on human health and wildlife. Some of the human health problems include cancer, genetic mutations, and harmful developmental effects on fetuses and infants affecting their intelligence, behavior, and immune systems. Studies on wildlife such as bald eagles show the effects of toxic pollutants on their reproductive successes.

The GLI also suggests that the measure of bioaccumulation in fish can be used as a measure of pollution.

The League also supports retaining 7Q10 as the measure of water flow. We believe the Clean Water Act prohibits weakening water pollution standards. Rather the goals of the Clean Water Act are to improve water quality.

We thank the Environmental Quality Board for the opportunity to comment on the Triennial Review.

Sincerely,

SR/HG

Sharon Rowe, President
League of Women Voters of WV
31 Poplar Estates
Princeton, WV 24740

Helen Gibbins, Natural Resources Director
League of Women Voters of WV
6128 Gideon Rd.
Huntington, WV 25705

Appalachian Center
for the Economy and the Environment

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RECEIVED
JUN 16 2003
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

June 9, 2003

West Virginia Environmental Quality Board
1615 Washington Street East, Suite 301
Charleston WV 25311-2126

RE: TRIENNIAL REVIEW OF WATER QUALITY STANDARDS RULE

Dear Board:

The Appalachian Center for the Economy and the Environment requests the Board reconsider exemptions to the West Virginia turbidity criterion at 46 CSR 8.32.1 and promulgate the turbidity criterion at 46 CSR 8.32 without exemptions. Specifically, the Center believes that the Board must promulgate the turbidity criterion so that coal mining operations are no longer exempt from the standard.

During the May 8, 2003 Environmental Quality Board meeting, discussion of the turbidity standard exemption for coal permittees centered in part on the fact that TSS was already included in coal effluent limits - thus minimizing the need for the turbidity water quality standard to apply to surface mining permit holders. However, the board should note that TSS effluent limits for the coal industry apply only during dry weather – precisely the time when TSS discharges are the lowest. In all other instances, the limit is for settleable solids - measuring only a fraction of the sediment discharged by surface mines. Please see sections 1.1, 2.1, 2.3 and 2.6 of *Coal Mining and the Clean Water Act: Why regulated coal mines still pollute West Virginia's streams* (attached).

In no other instance is the inclusion of a parameter in an effluent limit reason to exempt an entire industry from the ultimate control of water quality standards. Water quality standards are the backbone of effluent limits that protect public uses. In fact, it is the very instance when technology based effluent limits fail to protect public uses of a stream that water quality standards are used to develop water quality based effluent limits, 40CFR122.44. The exemptions to the turbidity standard give special preference to certain industries at the expense of the citizens of West Virginia.

Water quality criteria must be based on 304(a) guidance or on other scientifically defensible methods, 40 CFR 131.11 (a) and (b). Section 304 (a) guidance for Solids (Suspended, Settleable) and Turbidity, 1986, provides no exemptions to the criterion. Scientific justifications for the exemptions at 46 CSR

8.32.1 were never presented by the Water Resources Board when the turbidity standard was originally promulgated. Indeed, no such justification could have realistically been presented since the turbidity associated with coal mines are among the most egregious sources of pollution of the State's waters.

Increased turbidity and sediment delivery to streams can interfere with or prevent swimming and other recreational uses, severely impair or destroy fish, prevent successful fish reproduction, alter fish migration and movement, reduce food sources, and interfere with effective chlorination/disinfection of community drinking water sources, (EPA Quality Criteria for Water 1986). Sediment build-up in streams can result in shallow streambeds more likely to flood. The exemptions to the turbidity criterion put citizens, rivers, streams and aquatic life at risk for these problems.

There are other consequences resulting from the exemptions at 46 CSR 8.32.1. The WVDEP takes advantage of the turbidity exemption when writing water quality based effluent limits for coal mines. In the face of an impaired receiving stream NPDES permits are written without special regard for turbidity or total suspended solids. This failure underscores WVDEP's inability to protect designated and existing stream uses in the face of the coal industry's exemption from the turbidity standard. Increased turbidity downstream from mine discharge points is often symptomatic of poor run-off control generally. Excess turbidity is the canary in the mine for damaging mine run-off and discharges. It also follows that early assessment and control of mine discharges that cause significantly increased turbidity would be an important step to help prevent contributions to flooding from mining operations.

There is no valid justification for granting the coal industry an exemption from crucial provisions of the Clean Water Act. If coal operators are not harming the State's waters by discharging water that is high in turbidity, then it needs no exemption. If, on the other hand, discharges from coal operations violate the turbidity standard that applies to all other industries, then the exemption harms the State's waters and is unfair to dischargers who must abide by the law. We therefore ask the Board to reconsider the coal mining industry's exemption to the turbidity standard.

Respectfully submitted,

Margaret C. Janes

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Senior Policy Analyst

COAL MINING AND THE CLEAN WATER ACT: Why regulated coal mines still pollute West Virginia's streams

April, 2003

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TABLE OF CONTENTS

EXECUTIVE SUMMARY v

1. INTRODUCTION 1

1.1 POLLUTION FROM COAL MINING 2
Acid mine drainage *3*
Sediment *3*
Other pollutants *4*
1.2 THE REGULATORY CONTEXT 4
NPDES permits *4*
Total maximum daily loads *4*
Antidegradation *5*
The Surface Mining Control and Reclamation Act *5*

2. PERMITS ARE WEAK 6

2.1 LENIENT FEDERAL GUIDELINES ALLOW UNLIMITED, UNMONITORED POLLUTION 6
2.2 PERMITS DO NOT LIMIT TOXIC METALS SUCH AS SELENIUM 8
2.3 WATER QUALITY STANDARDS ARE WEAKER THAN FEDERAL GUIDELINES 9
2.4 PERMITS DO NOT ALWAYS PROTECT WATER QUALITY 11
Determining if receiving waters are impaired *11*
Permit limits in impaired waters *12*
Permit limits in unimpaired waters *14*
2.5 STREAMS ARE USED EXCLUSIVELY FOR WASTE ASSIMILATION AND TREATMENT 16
2.6 TROUT STREAMS ARE NOT FULLY PROTECTED 17

3. PERMIT MONITORING IS INSUFFICIENT 18

3.1 END-OF-PIPE MONITORING IS NOT REPRESENTATIVE 18
3.2 INSTREAM MONITORING IS NOT PERFORMED WHEN IT COUNTS 19

4. CONCLUSIONS AND RECOMMENDATIONS 20

4.1 DEP 20
4.2 EQB 22
4.3 USEPA 22
4.4 CITIZENS' GROUPS 22
4.5 SUMMARY 24

REFERENCES 25

TABLE OF TABLES

Table 1: Technology-based effluent limitations for coal mining 7
Table 2: Alternative storm limitations for coal mining in AMD areas 7
Table 3: Differences between West Virginia and recommended federal water quality criteria for coal-related parameters 10
Table 4: Completed AMD TMDLs in West Virginia 13
Table 5: Selected Tygart River watershed coal-mining NPDES permits 14

TABLE OF FIGURES

Figure 1: West Virginia coal mining discharges covered by NPDES permits 1

ACKNOWLEDGEMENTS

The authors wish to thank many people at the West Virginia Department of Environmental Protection for sharing information and documents, including Butch Borth, Pat Campbell, Margaret Miller, Dave Montali, and Ken Politan.

Martin Christ, Liz Garland, Pam Kasey, Joe Lovett, Jeremy Muller, and Cindy Rank provided useful feedback.

The authors also thank the Switzer Environmental Leadership Program Fund of the New Hampshire Charitable Foundation for funding the West Virginia Rivers Coalition's Permit Analysis Program and the Stern Family Fund for supporting the Appalachian Center for the Economy and the Environment.

SUGGESTED REFERENCE

Hansen, Evan and Margaret Janes. 2003. *Coal Mining and the Clean Water Act: Why regulated coal mines still pollute West Virginia's streams.* Elkins, WV: West Virginia Rivers Coalition and Appalachian Center for the Economy and the Environment. April.

ABBREVIATIONS

AMD	acid mine drainage
CFR	Code of Federal Regulation
CSR	Code of State Rules
CWA	Clean Water Act
DEP	West Virginia Department of Environmental Protection
EQB	West Virginia Environmental Quality Board
Fe	iron
L	liter
mg	milligram
Mn	manganese
MTR/VF	mountaintop removal/valley fill
NPDES	National Pollutant Discharge Elimination System
ppm	parts per million
SS	settleable solids
TBEL	technology-based effluent limitation
TMDL	total maximum daily load
TSS	total suspended solids
ug	microgram
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
WLA	wasteload allocation
WQBEL	water quality–based effluent limitation

1. INTRODUCTION

The West Virginia Department of Environmental Protection permits about 12,000 coal-related discharges across the state. However, the essential requirements of these Clean Water Act permits—limits on the discharge of pollutants into streams as well as monitoring of these discharges at important flows—are not consistently applied to the coal mining industry. Because of these failures, West Virginia's waters are degraded by coal mining operations, and agencies and the public often have no idea what amounts or types of pollutants are actually discharged.

Permitted coal mining operations, as well as older abandoned mines, discharge acid mine drainage, sediment, and other toxic pollutants, which together impair more than 2,000 miles of West Virginia's rivers and streams. Discharges from coal operations differ from those from most other industries because flows and pollutant concentrations often depend on rainfall. This difference is at the heart of several federal and state regulations, policies, and practices that cause coal-related permits to be weaker than those issued for other industries.

Based on a review of relevant regulations and an assessment of a set of randomly selected permits, this report documents both recent positive changes and persistent problems with coal permitting practices in West Virginia. The report also provides recommendations for several agencies that would bring these practices into compliance with Clean Water Act requirements, and for citizens who are concerned about the industry's effects on water quality.

2. PERMITS ARE WEAK

Permits limit the amount of pollutants that can be discharged, and are supposed to ensure that water quality standards in receiving streams are met at all times. Because of several deficiencies in permitting practices, permits for coal mine discharges do not always do so.

Lenient federal guidelines allow unlimited, unmonitored pollution

The U.S. Environmental Protection Agency has allowed the coal industry to operate under weak federal permitting guidelines. These guidelines were established based on the use of sediment ponds to control pollutant discharges. Since the 1980s, the agency recognized the limited treatment efficacy of ponds during precipitation. To address this concern, it included a complex series of exemptions, called alternative storm limitations, in its guidelines. The result was this: While many types of surface mines do not discharge during dry weather when the most stringent limits are in effect, those same mines were made exempt when it rains, the very times when discharges are the greatest. These exemptions therefore allow unlimited amounts of pollution to be discharged by nearly every kind of coal mine.

The alternative storm limitations have a second important implication: They allow permittees to forego monitoring of exempt pollutants during rainfall events. For that reason, mining companies, regulatory agencies, and the public do not know what is actually being discharged at exactly the times pollution discharges are the highest.

Permits do not limit toxic metals such as selenium

Some mines contain toxic metals in their discharges; however, toxic metals are excluded from regulation in federal permitting guidelines for the coal industry. The U.S. Environmental Protection Agency opted to use iron and manganese as indicator parameters that would reflect the overall efficacy of treatment. If iron

and manganese levels were low when monitored, it was assumed that levels of other toxic metals would be low, too. While this system makes monitoring more efficient, it adds uncertainty because iron and manganese are unlimited and unmonitored during rainfall for many types of coal mining operations. The agency also noted that some toxic metals could be found in significant amounts at some mines and urged state permitting authorities to consider imposing limitations in those cases. However, in West Virginia, the Department of Environmental Protection has failed to adequately evaluate coal discharges for toxic metals or issue permits that restrict their discharge.

For example, data from the recent mountaintop removal mining environmental impact study suggest that violations of the selenium water quality criterion are associated with some mountaintop removal coal mining operations, and that selenium limitations are warranted. Nevertheless, the Department of Environmental Protection still issues permits without selenium limits for coal mines that disturb high selenium soils.

Water quality standards are weaker than federal guidelines

All permits must be written to meet water quality standards in receiving streams. Numeric standards are in place for pH as well as pollutants that are typically discharged from coal operations: turbidity as a measure of sediment, iron, manganese, and aluminum. However, the West Virginia standards for these pollutants are weaker than federal guidelines. Turbidity is perhaps the most egregious example, because the standard explicitly exempts coal mining operations unless they discharge to trout streams. There is no scientific justification for this exemption.

As a result of these deficiencies, the Department of Environmental Protection is using weak standards, and even the most stringent permits based on these water quality standards will not protect existing and designated uses.

Permits do not always protect water quality

While federal guidelines serve as a starting point for permit development, regulations require state agencies to write more stringent permits when necessary in order to protect stream uses and comply with water quality standards. Unfortunately, the Department of Environmental Protection has failed to carry out this mandate. Although the agency's practices are improving over time, permit writers still use minimum federal permitting guidelines—along with alternative storm limitations—in cases where stricter permits are needed to protect receiving streams. In addition, less stringent permits are sometimes issued because the agency incorrectly assumes a receiving water is not impaired.

The Department of Environmental Protection also has failed to adequately protect streams that are already impaired, by ignoring a federal prohibition against new discharges that cause or contribute to impairment. Existing permits have been reissued with lenient limits despite the fact that they too are causing or contributing to impairments. In addition, in streams where cleanup plans have been developed, the agency has failed to implement the plans and issue protective permits as required.

In unimpaired waters, permit limits must be calculated, at a minimum, to maintain water quality to meet existing and designated uses and to comply with antidegradation requirements. The Department of Environmental Protection's practices for establishing permit limits in unimpaired waters have evolved and improved over the last 25 years, but they still do not comply with the Clean Water Act.

Streams are used for waste assimilation and treatment

Federal and state regulations clearly ban waste transport and waste assimilation as primary stream uses. However, the Department of Environmental Protection commonly permits mining operations to build sediment ponds directly in streambeds and below valley fills, transforming streams from free-flowing, biologically rich habitats into waste assimilation and treatment systems. About one-third of the West Virginia's coal permits have been issued for these instream ponds; all of these permits are illegal and undermine the primary goals of the Clean Water Act.

Trout streams are not fully protected

The Clean Water Act requires permits to be written to protect both existing stream uses and those uses designated by the state. In West Virginia, a designated use for trout waters provides special protection from excess sediment, heat, and chemical pollutants in order to preserve trout habitat, assure reproduction, and prevent mortality.

While this scheme should protect trout streams from pollution, it does not. When the Department of Environmental Protection writes permits for coal operations, it recognizes only those trout streams that are currently inventoried by the West Virginia Division of Natural Resources as native brook trout habitat, thereby ignoring some trout streams designated by the state, and other streams with existing trout uses. The agency, in fact, is removing uses solely at its discretion, counter to a clear Clean Water Act mandate that use removals must follow strict protocols called use attainability analyses. The agency's policy not only severely limits protection for trout habitat, but also excludes the public and other agencies from a crucial decision-making process required for removing uses.

A second flaw in the Department of Environmental Protection's permitting practices undermines protections for trout streams as well. The state water quality criterion for turbidity exempts coal mining operations. Although this exemption does not apply in trout streams, coal mining operations that discharge to trout waters are still routinely assigned minimum permit limits for sediment, including alternative storm limitations. The agency requires no special efforts to control sediment discharges to trout waters, despite the fact that coal mining operations are legally required to prevent sedimentation in these sensitive streams.

3. PERMIT MONITORING IS INSUFFICIENT

All permits require self-monitoring to ensure that permit limits are met. End-of-pipe monitoring is used to compare actual discharges with permit limits. In addition, instream monitoring is often used to ensure that permitted discharges are not causing violations of water quality standards in receiving streams. Current permitting practices are insufficient in both cases.

End-of-pipe monitoring is not representative

To be useful in ensuring compliance, monitoring data must provide an accurate picture of what is being discharged. Current practices, however, do not guarantee that these data are representative. The Department of Environmental Protection generally requires routine end-of-pipe monitoring only twice a month, and permittees need not monitor parameters that are granted rainfall exemptions at the time that samples are taken. The agency does not require additional monitoring during storm events; therefore, data about peak load discharges of important pollutants do not exist.

For permits assigned more stringent limits, the agency generally requires more thorough monitoring because the limits are in force even when it rains. Thus, some information on peak discharges should be

obtained as random twice-a-month sampling theoretically coincides with at least some storm events. Still, these permits do not require monitoring during storms. Without regularly collected data that are representative of discharges over all precipitation intensities, it is difficult if not impossible to assess the impacts of coal mines on our rivers and streams.

The paucity of accurate monitoring data is compounded by another policy. If an outlet does not discharge on the day that samples are collected, permittees record "no flow" on their monitoring report, whether or not "no flow" is truly representative of the discharges over the entire month. While this practice appears to violate the federal requirement for representative monitoring, it is sanctioned by the agency.

Instream monitoring is not performed when it counts

The episodic nature of precipitation-induced pollutant discharges makes it unlikely that instream data collection, without a focused storm sampling component, can accurately assess pollutant loads. While coal operations are often required to collect instream data and the Department of Environmental Protection occasionally performs its own instream sampling, the agency has performed no focused storm sampling downstream from coal mines. Even the recent mountaintop removal environmental impact study did not include a storm sampling focus in its study of water quality impacts in receiving streams. The bottom line: There are little or no publicly available data that accurately assess the impacts from active coal mines to receiving streams, and there is no way to determine whether discharges cause or contribute to violations of water quality standards or if stream uses are protected.

4. CONCLUSIONS AND RECOMMENDATIONS

Many of the Department of Environmental Protection's permitting practices do not conform to those required by the Clean Water Act, and therefore do not protect our rivers and streams from pollution from coal mines. But the Department of Environmental Protection does not operate in a vacuum; the West Virginia Environmental Quality Board and the U.S. Environmental Protection Agency also share the responsibility to ensure that coal mining operations are held to minimum federal standards. If these agencies were to simply follow the law, permitted discharges—and West Virginia's rivers and streams—would be cleaner. There are many reasons why weak permits continue to be written. Improvements must be made.

The Department of Environmental Protection

This report documents several deficient permitting practices at the Department of Environmental Protection. The agency fails to write permits that restrict the discharge of toxic metals like selenium, even when mining is likely to cause instream violations. Permit writers do not routinely assess the reasonable potential for permitted discharges to cause or contribute to violations of water quality standards. Clean Water Act mandates are ignored, such as the prohibition against permitting new loads into impaired waters before river cleanup plans are developed. In addition, the agency has not followed through on its commitment to implement these cleanup plans.

The Department of Environmental Protection's new antidegradation guidance further weakens existing procedures and will make antidegradation review a rubber stamp for dischargers. Also, counter to the fundamental goals of the Clean Water Act, the agency sanctions the use of streams for waste disposal by issuing permits for instream sediment ponds, and fails to recognize and protect all existing and designated trout streams.

Because of Department of Environmental Protection policies, permittees' monitoring requirements are inadequate to characterize the discharges or impacts to receiving streams, especially when it rains. No focused instream storm studies have been conducted by the agency to fully characterize the impacts of mining discharges on any of the rivers or streams in coal-producing areas of West Virginia.

The Department of Environmental Protection must, at a minimum, take several steps to ensure that coal mining permits protect water quality as required by federal law:

- Strengthen permits. Issue permits without alternative storm limitations, assign appropriate discharge limits for toxic metals, and do not issue new permits for discharges into impaired streams until cleanup plans have been developed that include allocations for new permits. Issue strict permits when necessary to protect receiving streams. Stop permitting new discharges from instream treatment ponds and treatment systems below valley fills, and phase out existing permits for these discharges. Finally, ensure that permits protect all trout streams.
- Improve monitoring. Ensure that enough recent data are available to determine whether receiving streams are impaired for all relevant pollutants. Require more frequent monitoring of discharges, including daily monitoring for large mines. Require monitoring during storms for all permits and for all relevant parameters, even if those parameters are not limited at the time of the sampling. Require truly representative monitoring. Require instream storm sampling below outfalls as part of routine instream monitoring conditions in permits. Collect storm data below coal mining discharge points.
- In addition, consider enforcement actions when violations of the selenium criterion can be directly linked to a permitted discharge. Implement antidegradation in a manner that is consistent with federal law. And do not write river cleanup plans or assign load reductions without an accurate assessment of contributions from active mines.

The Environmental Quality Board

The Environmental Quality Board plays a key role in setting water quality standards, the underpinning of all permitting decisions. However, standards for coal-related parameters do not meet federal guidance or protect stream uses. The board should:

- Ensure that all water quality criteria comply with federal guidance or give sound scientific reasons why other criteria are valid for West Virginia.

The U.S. Environmental Protection Agency

Federal regulations for coal mines exempt most coal mining operations from meaningful discharge limits when it rains, and are based on the U.S. Environmental Protection Agency's lenient interpretation of the Clean Water Act. To promote better permitting practices in West Virginia, the agency should:

- Review federal effluent guidelines for coal mining and remove the alternative storm limitations.
- Disapprove West Virginia's pH, turbidity, iron, manganese, and aluminum standards, and promulgate new standards that are consistent with federal guidance.

Citizens' groups

About 90 grassroots watershed organizations are active across West Virginia; many of these groups are dealing with pollution from coal mining. These citizens have a major stake in improving permitting practices so that permits for coal mining operations truly protect local rivers and streams. Citizens' groups can take the following actions:

- Gather background information by identifying all coal mine permits, known or listed trout streams, and streams impaired by acid mine drainage in the watershed. Get copies of all local,

completed acid mine drainage cleanup plans. Determine if coal seams are likely to be high in selenium.

- Collect detailed information. Examine permits to ensure that discharge limits protect the uses of local streams. Collect permit monitoring data and compare it with permit limits. Ensure that permit violations are enforced. Also, gather instream data to check that dischargers are not causing violations of water quality standards, and make sure to include data collected when it rains. Periodically collect macroinvertebrate data to help evaluate the biological integrity of streams. Track precipitation events to compare with the information submitted by permittees.
- Participate in the permitting process. Comment on new, reissued, and modified local permits.

Summary

While the Department of Environmental Protection has committed to some improvements in the way coal permits will be written in the future, permits still will not comply with the mandates of the Clean Water Act. It is too early to tell if improvements will actually decrease the amount of pollution coming from coal mining operations.

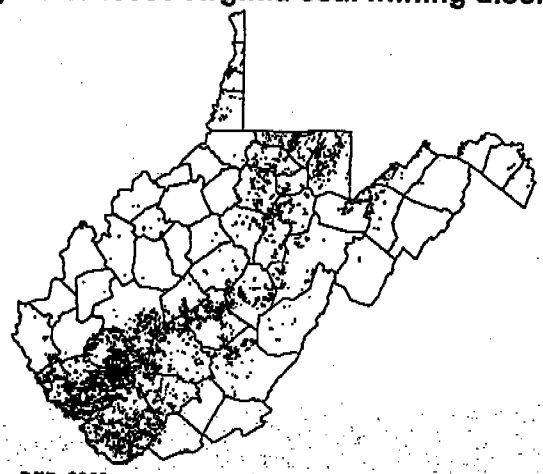
Truly protective permits will only be written when adequate monitoring fully characterizes mining discharges and their impacts to receiving streams. Protective permits will also only be written when the Department of Environmental Protection, Environmental Quality Board, and U.S. Environmental Protection Agency improve state water quality criteria, antidegradation implementation procedures, and guidelines for issuing effluent limitations to ensure that coal mining operations are held to Clean Water Act standards.

Changes in permitting policies at the Department of Environmental Protection to conform to existing laws are also necessary to ensure that the coal mining industry is held accountable for its water pollution just as every other industry in the country. Improvements will take political will, commitment, and leadership.

1. INTRODUCTION

The West Virginia Department of Environmental Protection (DEP) permits about 12,000 coal-related discharges across the state, as shown in Figure 1. However, the essential requirements of these National Pollutant Discharge Elimination System (NPDES) permits—limits on the discharge of pollutants into streams as well as monitoring of these discharges at important flows—are not consistently applied to the coal mining industry. Because of these failures, West Virginia's waters are degraded by coal mining operations, and agencies and the public often have no idea what amounts or types of pollutants are actually discharged.

Figure 1: West Virginia coal mining discharges covered by NPDES permits



Source: DEP, 2003.

Discharges from coal operations differ from those from most other industries, most fundamentally because flows and pollutant concentrations often depend on rainfall. The variability of the quantity and quality of discharges from coal mines was recognized early, as the U.S. Environmental Protection Agency (USEPA) first developed guidelines for writing coal NPDES permits (USEPA, 1982). This variation is at the heart of several federal and state regulations, policies, and practices that cause coal-related permits to be weaker than those issued for other industries.

Based on a review of relevant regulations and an assessment of a set of randomly selected permits, this report documents both recent positive changes and persistent problems with coal NPDES permitting practices in West Virginia. The report provides recommendations for several agencies that would bring these practices into compliance with Clean Water Act (CWA) requirements, and for citizens who are concerned about the industry's effects on water quality.

While the routine discharges of pollutants to our waters from mining operations do not receive much attention, they are vitally important to the health of West Virginia's rivers and streams and are the focus of this report. In contrast, blackwater discharges, the burying of streams, and flooding related to coal mining in West Virginia have received significant media and legal attention over the last few years. Much of this attention has focused on mountaintop removal operations, in which the tops of mountains are blasted apart and dumped into nearby hollows, burying streams under massive valley fills. The significant legal and environmental issues surrounding these operations are important; however, they are not NPDES permitting issues and are not addressed in this report.

All types of active coal mining operations—including surface mines, deep mines, preparation plants, and refuse disposal areas—operate under NPDES permits that regulate the amount of pollutants that may be discharged to rivers and streams.[1] At first glance it may seem that pollution from active sites is insignificant because they have received permits, but further investigation shows that this is not necessarily the case. As detailed in this report, weak permitting practices, weak or nonexistent permit limits when discharges are most likely to occur, and unrepresentative monitoring all suggest that pollutant discharges are not effectively controlled and that permitting agencies—and the public—do not know the extent of active operations' contributions to coal mine pollution in our rivers and streams.

"At first glance it may seem that pollution from active sites is insignificant because they have received permits, but further investigation shows that this is not necessarily the case."

This report begins with a brief description of different types of coal mining operations and the pollutants that they generate, as well as the regulatory context within which NPDES permitting decisions are made.

Section 2 then describes why weak NPDES permits are issued: Lenient federal guidelines allow unlimited and unmonitored pollution, permits do not limit critical toxic metals, state water quality standards do not meet federal requirements, state policies do not require all coal-related permits to protect water quality, permits illegally allow the use of streams for waste treatment, and permits do not protect trout waters.

Insufficient permit monitoring, documented in Section 3, makes it impossible to know what is actually being discharged from these operations. This lack of information undermines the integrity of the permitting system and other processes such as the determination of stream impairment, the development of total maximum daily load (TMDL) river cleanup plans, and the implementation of the state's antidegradation policy.

After presenting conclusions, Section 4 makes recommendations for citizens interested in the effects of coal mining on local watersheds. Recommendations are also offered that would bring the DEP, the West Virginia Environmental Quality Board (EQB), and the USEPA into compliance with the Clean Water Act, in order to adequately protect West Virginia's rivers and streams.

1.1 Pollution from coal mining

Coal mining operations, active and inactive, impair West Virginia's rivers with acid mine drainage (AMD), sediment, and other toxic pollutants. These pollutants are generated when earth and minerals disturbed during coal extraction come in contact with the atmosphere, rainwater, runoff, and groundwater. Polluted water is typically treated by collecting contaminated runoff or groundwater in earthen sediment ponds at mining sites. These ponds are designed to slow the rate of discharge, provide time for additional water treatment, if needed, and allow for sediment and other pollutants to settle to the bottom (USEPA, 1982). Most mines have multiple ponds and discharge points, or outlets; some large mines have more than 50.

In the case of underground mines, ground and surface water often seep into deep mine workings and are then pumped out and discharged to facilitate the retrieval of coal.[2] Discharge flows are typically controlled by pumps, while discharge quality primarily depends on the makeup of the coal seam and the surrounding rock, or overburden. In some instances, underground pumped discharges from non-acid-producing seams are relatively clean and can be directly discharged to receiving streams. In most cases,

[1] NPDES permits are issued for point source discharges: those that release pollutants from a pipe or man-made conveyance.

[2] In some cases, water is pumped into the mine to accommodate dust suppression.

however, underground mine discharges contain pollutants and are directed to sediment ponds, where they are commingled with surface water and are therefore subject to rules weakened by exemptions when it rains, as described in Section 2.1.

"The relative control of most underground mine discharges stands in contrast to surface mine discharges, which depend almost entirely on recent rainfall."

The relative control of most underground mine discharges stands in contrast to surface mine discharges, which depend almost entirely on recent rainfall. Ditches and drainage-ways typically direct surface mine runoff to sediment ponds, although in some cases ditches directly discharge to nearby streams. Ditches also direct surface runoff from surrounding areas away from mining sites, to minimize the volume of water collected in sediment ponds. Sediment ponds must be constructed and maintained to meet state and federal capacity requirements[3] and are located in or adjacent to streams.

Coal preparation plants clean mined coal for commercial use. As much as half of the coal mined can end up as waste, composed of coarse rock and fine-grained coal and mineral matter (NRC, 2002). This waste is disposed of in refuse piles or discharged to slurry impoundments, which hold a slurry of waste coal and water from the cleaning process. Water is either removed from impoundments to be reused in preparation plants or discharged to sediment ponds and then to receiving streams. Slurry impoundment failures have caused devastating environmental disasters, such as the impoundment breakthrough near Inez, Kentucky in 2000 (NRC, 2002). This report, however, focuses on routine permitted discharges from these and other mining facilities.

Acid mine drainage

"AMD is one of the state's most significant water quality problems."

AMD is one of the state's most significant water quality problems. Although large amounts of AMD flow from bond forfeiture sites and abandoned mine lands,[4] these pollutants are also discharged from active, permitted sites.

More than 2,000 miles of rivers and streams appear on West Virginia's 1998 303(d) list of impaired waters for AMD, representing 70 percent of all listings (DEP, 1998a).[5] AMD pollution includes metals—typically aluminum, iron, and manganese—which add acidity to receiving streams, and which have their own harmful effects on aquatic life or human health. The acidity contributed by these metals often causes receiving streams to violate the pH water quality criterion, thereby making it difficult or impossible for aquatic life to survive. A further environmental harm from AMD occurs when iron coats stream beds and makes it difficult or impossible for insects and fish to survive.

Sediment

Coal mines also discharge significant amounts of sediment (USEPA, 1982). Excess sediment can harm aquatic life, especially trout. Sediment often carries with it nutrients and metals, which can further impair water quality. River water with increased sediment is more expensive to treat for human consumption and can inhibit recreational uses.

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[3] Federal requirements are at 30 CFR 816.46 and state requirements are at 38 CSR 2-4.7.b.

[4] Bond forfeiture sites and abandoned mine lands typically do not operate under NPDES permits; therefore, they are not considered in this report.

[5] According to CWA regulations, DEP must compile its 303(d) list of impaired waters every two years. This list includes all waters that do not meet water quality standards. Because of a temporary change in the regulations, DEP did not release a list in 2000. AMD-impaired segments include 15 from Table A of the 1998 list and 488 from Table B. West Virginia's 2002 list also contains significant numbers of segments impaired by AMD; however, this list has not yet been approved by USEPA.

DEP does not currently list streams solely for sediment impairment on the 303(d) list (Campbell and Montali, 2003). However, a recent study indicates increased sediment below valley fills, compared with unmined sites (Wiley et al., 2001). There is also significant anecdotal evidence that sedimentation is adversely affecting streams in coal mining regions. In 1999 and 2000, American Rivers documented sediment build-up in the Coal River stemming from mountaintop removal coal mining operations and associated valley fills. In both years, it placed the Coal River on its national Most Endangered Rivers list, and in 2000 it noted that the Coal River, once more than twelve feet deep, is now only inches deep in some places (American Rivers, 2002). Local residents recall swimming in segments of the Coal River that now barely come up to the knee. This sediment build-up of the Coal River's bottom occurs below several mines with large valley fills (Bonds, 2002).

"Local residents recall swimming in segments of the Coal River that now barely come up to the knee. This sediment build-up of the Coal River's bottom occurs below several mines with large valley fills."

Other pollutants

Several other pollutants may be discharged from coal mining operations but typically do not have discharge limits (See Section 2.2). For example, the USEPA has found selenium concentrations that exceed water quality standards downstream from several mountaintop removal/valley fill (MTR/VF) coal mines in West Virginia (Bryant et al., 2002). Nine of these streams were put on West Virginia's 2002 303(d) list, which has been submitted to USEPA for approval (DEP, 2002a).

1.2 The regulatory context

NPDES permits

The federal CWA set an aggressive goal of eliminating the discharge of pollutants into the nation's waters by 1985.[6] An interim goal—achieving water quality sufficient to protect aquatic life and to provide for recreation—was to be attained by 1983.[7] Clearly, these fundamental goals have yet to be met.

The CWA makes it unlawful to discharge pollutants from point sources into receiving waters unless NPDES permits are obtained.[8] The authorized discharge of pollutants into the nation's waters thus is a privilege granted to point source facilities by the public, and is intended as a stepping stone toward the ultimate elimination of all discharges. Virtually all types of active coal operations that discharge pollutants to streams or rivers are point source discharges and are subject to NPDES permits.

In West Virginia, the USEPA has delegated responsibility for administering the NPDES program to the DEP, but sets minimum federal standards and retains oversight of the permitting process. Although DEP's Division of Water and Waste Management actually approves mining NPDES permits, these permits are developed by the Division of Mining and Reclamation.

Total maximum daily loads

TMDL cleanup plans are developed for impaired waters on the State's 303(d) list. In compliance with CWA regulations, these plans allocate needed reductions in pollutant discharges to point and nonpoint sources.[9] The reductions assigned to point sources must be incorporated into their NPDES permits.

[6] 33 U.S.C. § 1251(a)(1).
[7] 33 U.S.C. § 1251(a)(2).
[8] 33 U.S.C. § 1311.
[9] 40 CFR 130.7.

Agencies use other means, such as direct subsidies and cost-share programs, to implement nonpoint source pollutant reductions.

Antidegradation

Antidegradation provides a three-tiered approach to water quality protection. Tier 1 protection applies to all waters of the state and requires the maintenance of water quality that supports public uses. Tier 2 protection only allows high quality waters to be degraded when it is necessary for important local economic or social development, and Tier 3 absolutely protects outstanding waters of particular state or national importance. In 2001, the West Virginia legislature passed, and USEPA approved, West Virginia's antidegradation implementation procedures. These procedures do not meet the federally required minimum antidegradation standards outlined in the CWA,[10] and illegally exempt many activities from antidegradation review. The procedures are being challenged in court and a decision is expected in 2003.[11]

The Surface Mining Control and Reclamation Act

While the CWA requires NPDES permits that limit pollutant discharges to protect water quality, the 1977 federal Surface Mining Control and Reclamation Act imposes broader requirements on coal mining operations, which are intended to protect society and the environment from a range of adverse effects (McElfish and Beier, 1990).[12] When properly implemented, these laws are intended to work together to minimize or eliminate coal mining's environmental and social damages.

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[10] 40 CFR 131.12.
[11] Ohio Valley Environmental Coalition et al. vs. Christie Whitman, Administrator, USEPA.
[12] 30 U.S.C. § 1201.

2. PERMITS ARE WEAK

Before explaining the weaknesses of coal permits, this section provides a brief background on NPDES permitting practices. NPDES permits contain limits on the maximum amount of various pollutants that can be discharged into waterways. These limits can be calculated in one of two ways: based on the technology used for treatment, or based on the resulting water quality in receiving streams.

Guidelines for technology-based effluent limitations (TBELs) are established by USEPA for broad industrial categories by assuming the use of minimum, industry-specific pollutant control technologies. All dischargers in each industry, including the coal industry, must meet or exceed TBELs. Until recently, virtually all limits for coal-related permits have been TBELs. TBELs are based on the use of standard, existing technologies and do not account for the characteristics of receiving waters or additional discharges of similar pollutants from other nearby facilities; therefore, they are often not stringent enough to ensure that water quality standards in receiving waters are met and that uses of streams are protected.[13]

"TBELs are based on the use of standard, existing technologies and do not account for the characteristics of receiving waters or additional discharges of similar pollutants from other nearby facilities; therefore, they are often not stringent enough to ensure that water quality standards...are met..."

In contrast to TBELs, water quality–based effluent limitations (WQBELs) are calculated to protect water quality in receiving streams. Federal regulations require states to assess discharges to determine whether these more stringent limits are needed. In particular, WQBELs are necessary if a discharge, after the application of a TBEL, has the reasonable potential to cause or contribute to a violation of water quality standards.[14]

2.1 Lenient federal guidelines allow unlimited, unmonitored pollution

USEPA has allowed the coal industry to operate under weak technology-based permits since they first establish TBEL guidelines for coal mining operations in the 1980s.[15] These guidelines are still used today as the basis for many coal mining NPDES permits. As shown in Table 1, TBELs are required for sediment, measured as total suspended solids (TSS), as well as for iron, manganese, and pH.

TBELs are based on the use of sediment ponds as the pollution control technology. From the beginning, USEPA recognized the limited treatment efficacy of these ponds when it rains: "[p]recipitation events can make it infeasible [for coal operators] to meet [technology-based] effluent limitations on TSS, iron and manganese..." (USEPA, 1982, p. 284). To address this concern, USEPA weakened the TBELs with a series of exemptions, called alternative storm limitations, in their guidelines for TBELs.[16]

As shown in Table 2, adopted from a section included in most coal mining NPDES permits, limitations get weaker— or in some cases are removed—as soon as it rains. For example, manganese and iron limits for discharges from steep slope and mountaintop removal mining areas (effluent type "f") are removed as soon as it rains, no matter how little.

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[13] In accordance with the CWA, West Virginia rules contain water quality standards for a wide range of pollutants to protect each water use. One of the primary functions of these standards is to help set permit limits. Standards are also used to determine whether or not waters are impaired.

[14] 40 CFR 122.44 (d)(i).

[15] 40 CFR 434.

[16] 40 CFR 434.63.

Table 1: Technology-based effluent limitations for coal mining

Parameter	Discharge Limitations (mg/L) Maximum daily	Average monthly
Sediment (TSS)	70	35
Iron	6	3
Manganese	4	2
pH must be between 6 and 9 at all times		

Notes: From 40 CFR 434. mg/L = milligrams per liter. TSS = total suspended solids.

Limitations on sediment switch from TSS[17] during dry weather to a less stringent measure of sediment—settleable solids (SS)[18]—as soon as there is any precipitation for effluent types "d," "f," and "g." SS measures only the coarse sediment that settles quickly to the river bottom, instead of all the solids in the water. No sediment limits apply to any operations during storms greater than the ten-year 24-hour storm, with the exception of effluent type "a."

Table 2: Alternative storm limitations for coal mining in AMD areas

Effluent type	Dry weather	Discernable precipitation	1-year 24-hour storm	2-year 24-hour storm	10-year 24-hour storm
a. Discharges from underground workings of underground mines not commingled	TSS pH Fe Mn (No alternative limitations)				
b. Discharges from underground workings of underground mines commingled	TSS pH Fe Mn				pH
c. Controlled surface mine drainage (except steep slope and mountaintop removal mining)	TSS pH Fe Mn				pH
d. Non-controlled surface mine drainage (except steep slope and mountaintop removal mining)	TSS pH Fe Mn	SS pH Fe Mn		SS pH	pH
e. Discharges from coal refuse disposal areas	TSS pH Fe Mn		SS pH		pH
f. Discharges from steep slope and mountaintop removal mining areas	TSS pH Fe Mn	SS pH			pH
g. Discharges from preparation plants and preparation plant associated areas (excluding coal refuse piles)	TSS pH Fe Mn	SS pH			pH
h. Discharges from reclamation areas	SS pH				pH

Notes: Adopted from DEP, 2000, which is based on 40 CFR 434.63. Discernable precipitation is defined as any discharge or increase in volume of a discharge caused by precipitation within any 24 hour period. Dry weather limitations for TSS, pH, Fe, and Mn are the TBELs shown in Table 1. All SS limits are as follows: SS < 0.5 mL/L maximum daily. TSS = total suspended solids. SS = settleable solids. Fe = iron. Mn = manganese.

"These exemptions therefore allow unlimited amounts of pollution to be discharged by nearly every kind of coal mine."

These weak alternative storm limitations for TBEL coal permits are significant for two key reasons. First, surface mine discharges may be poorly controlled—or in some cases, uncontrolled—at critical times: during storms when discharge flows are typically the greatest. In fact, because of the dependence of surface mining discharges on rainfall, many types of surface mines typically do not discharge during dry weather, the very time when the most stringent limits are in effect (Politan et al., 2002). These exemptions therefore allow unlimited amounts of pollution to be discharged by nearly every kind of coal mine. Whether or not USEPA provides relief from TBELs during storms, the CWA still requires that permits be written to protect stream uses and meet instream water quality standards during all types of weather. If discharges from an operation with a TBEL permit cause a water quality standard

[17] TSS includes all the suspended matter in the stream.

[18] SS measures the solids that settle in an Imhoff cone in 45 minutes, plus the solids that settle during an additional 15 minutes after the cone is gently stirred (USEPA, 1982).

violation or impair a stream use, a more stringent permit must be written. Permit writers are not currently meeting this requirement.

The alternative storm limitations are also important because federal regulations require permittees, at a minimum, to monitor for pollutants that are limited at the time the sample is taken.[19] For example, monitoring of mountaintop removal and preparation plant areas during rainfall must only include pH and SS, and need not include iron and manganese. Additional monitoring at high flows can be, but is not, required by DEP (Politan et al., 2002). Not requiring monitoring during storms prevents mining companies, regulatory agencies, and the public from knowing what pollutant loads are actually being discharged at exactly the times when discharge flows are the highest (See Section 3).

If discharges from an operation with a TBEL permit cause a water quality standard violation or impair a stream use, a more stringent permit must be written. Permit writers are not currently meeting this requirement."

Recommendations

DEP

- Issue permits without alternative storm limitations. Until research demonstrates that pollutant loads discharged during storms do not impair receiving waters, these exemptions cannot be justified.

USEPA

- Review federal effluent limitation guidelines for coal mining and remove the alternative storm limitations. The failure of coal TBELS to protect water quality during precipitation necessitates removing these exemptions. Improved treatment systems should be required to ensure that water quality standards are met.

2.2 Permits do not limit toxic metals such as selenium

In developing TBEL guidelines for coal mining, USEPA recognized that some mines would likely contain toxic metals in their untreated discharge (USEPA, 1982); however, many toxic metals were excluded from regulation. Some (e.g., antimony, beryllium, cadmium, cyanide, silver, and thallium) were excluded because they could not be effectively reduced by technologies known at the time and because they were detected infrequently and at very low levels (USEPA, 1982). Others (e.g., arsenic, chromium, copper, lead, mercury, nickel, selenium, and zinc) were excluded because sediment ponds were thought to effectively control the small amount of these metals typically found (USEPA, 1982).

Instead of requiring TBELs for a long list of toxic metals, USEPA opted to use iron and manganese as indicator parameters that would reflect the overall efficacy of treatment. If iron and manganese levels were low when monitored, it was assumed that levels of other toxic metals would be low, too. While this system makes monitoring simpler, it adds uncertainty because iron and manganese are unlimited and unmonitored during rainfall for many types of coal mining operations.

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USEPA also noted that some toxic metals could be found in significant amounts at some mines and urged state permitting authorities to consider imposing limitations in those cases (USEPA, 1982). The responsibility therefore rests with DEP to ensure that toxic metals found in West Virginia's coal mining discharges are limited appropriately.

[19] 40 CFR 122.44(i).

In one recent example, data suggest that violations of the selenium water quality criterion are associated with coal mining operations, and that selenium limitations are warranted. As a result of the settlement agreement stemming from the 1998 West Virginia lawsuit on mountaintop removal operations, state and federal agencies drafted an environmental impact statement on MTR/VF coal mining. The study, among other things, evaluated the water quality impacts of coal mines. Water samples taken in 2000 and 2001 document instream violations of the selenium water quality criterion in 66 of 210 samples.[20] All tests above the criterion were at sampling sites associated with MTR/VF operations. At one site associated with a large mining complex, the average test results exceeded the criterion by more than 7 times. The environmental impact statement further states that in the region of MTR/VF mining, "the coals can contain an average of 4 ppm of selenium, normal soils can average 0.2 ppm, and the allowable limits in the streams are 5 ug/L (0.005 ppm). Disturbing coal and soils during [MTR/VF] mining could be expected to result in violations of the stream limit for selenium." (Bryant et al., 2002, Section 6.8, p.1). Nevertheless, DEP still issues permits without selenium limits for coal mines that disturb high selenium soils.

Selenium Toxicity

Selenium is an essential nutrient at low levels; however, excess selenium in humans can cause nerve damage, fatigue, bronchitis, pneumonia, and kidney, liver, and circulatory damage. Some forms of selenium are carcinogenic. In wildlife, excess selenium causes reproductive failure (it can destroy fish populations with no other symptoms), birth defects, gill failure, anemia, liver impairment, kidney damage, heart disease, eye damage, and corneal cataracts (Lemly, 2002; USEPA, 2002b).

To date, DEP has issued only one NPDES permit with limits for zinc, and none for arsenic, chromium, copper, lead, mercury, nickel, or selenium (Politan et al., 2002). However, DEP placed nine streams with selenium violations shown in the environmental impact statement on its 2002 303(d) list, with the cause listed as unknown. The first selenium TMDL cleanup plans are scheduled to be released in 2004 (Campbell, 2002).

Recommendations

DEP

- Assign appropriate discharge limits for toxic metals. In particular, determine which coal operations have the potential to cause or contribute to violations of the selenium criterion, and promptly issue stringent selenium limits to prevent these violations from continuing. Rather than waiting for existing permits to be renewed, immediately reopen suspect permits.[21]
- Consider enforcement actions. When violations of the selenium criterion can be directly linked to a permitted discharge, enforcement actions may be warranted.

2.3 Water quality standards are weaker than federal guidelines

Ultimately, all coal NPDES permits must be written to protect the uses of West Virginia's rivers and streams, and must comply with the CWA.[22] Stream uses range from recreation, to propagation and maintenance of aquatic life, to public water supply.[23] Each use is assigned specific water quality criteria for common pollutants and conditions that, if met, will protect those uses. Protective, scientifically sound

[20] West Virginia's water quality standards include selenium criteria to protect aquatic life and human health. The most stringent of these criteria is the chronic aquatic life criterion: 5 ug/L.

[21] All NPDES permits contain a condition that states that discharges must not cause violations of West Virginia narrative water quality criteria. One narrative criterion prohibits the discharge of "materials in concentrations which are harmful, hazardous or toxic to man, animal or aquatic life" (46 CSR 1.3).

[22] 40 CFR 131.12, 40 CFR 122.43; 40 CFR 122.44, 47 CSR 30.3.2.a.1 & 6.

[23] 46 CSR 1.6 lists all of West Virginia's uses.

water quality standards are the foundation of most CWA programs and activities, such as WQBELs, the listing of impaired waters on the 303(d) list, the development of TMDL cleanup plans, and the implementation of antidegradation.

Discharges from coal mining activities may be acidic and typically contain sediment, iron, and manganese, and sometimes aluminum and other metals. Numeric water quality criteria are in place for each of these pollutants; however, the West Virginia criteria for pH, iron, manganese, aluminum, and turbidity are weaker than federal guidelines (USEPA, 2002a and 1986).[24] Table 3 compares the important differences between West Virginia criteria and recommended federal criteria for these coal-related parameters.

Turbidity is perhaps the most egregious example, because the standard explicitly exempts coal mining operations from meeting the standard, unless they discharge to trout streams. There is no scientific justification for this exemption. As a result of these deficiencies, DEP is using weak criteria that do not protect stream uses in a range of cases. Even when WQBELs are calculated, coal NPDES permits are not as strict as necessary to protect existing and designated uses. TMDL cleanup plans and other programs based on these water quality criteria are also flawed because the targets set to measure clean water are weak and do not protect stream uses.

"TMDL cleanup plans and other programs based on these water quality criteria are...flawed because the targets set to measure clean water are weak and do not protect stream uses."

Table 3: Differences between West Virginia and recommended federal water quality criteria for coal-related parameters

Parameter	Human health[25]		Aquatic life	
	West Virginia	Federal	West Virginia	Federal
Iron[a, c]	1.5 mg/L	0.3 mg/L	1.5 mg/L	1.0 mg/L
Manganese (applicability)[c, e]	only 5 miles above drinking water source	everywhere	none	none
Manganese (criterion)[b, c]	1 mg/L	0.05 mg/L	none	none
Aluminum[c]	none	none	Conversion factor included[26]	No conversion factor
Turbidity[d]	none	none	coal exempt, except in trout waters	coal not exempt
pH	6 - 9[27]	5 - 9	6 - 9	6.5 - 9

Notes: West Virginia criteria are from 46 CSR 1 Appendix E. Recommended federal criteria are from USEPA, 2002a. a = Disapproved and later approved by USEPA (Laskowski, 1994; Capacasa, 2003). b = Disapproved by USEPA (Laskowski, 1994). c = Subject of litigation initiated by the Mid-Atlantic Environmental Law Center on behalf of the West Virginia Rivers Coalition, which is pending (Stuhltrager, 2003a and b). d = The Appalachian Center for the Economy and the Environment, on behalf of the West Virginia Rivers Coalition, has petitioned USEPA to reconsider its 1982 approval; the decision is pending (Janes, 2002). e = Subject to the Alaska rule and not currently implemented. USEPA approval or disapproval is pending (Chatfield, 2002).

[24] West Virginia's water quality criteria are at 46 CSR 1.

[25] The human health criteria for iron and manganese relate to organoleptic effects: those relating to taste, odor, and staining.

[26] USEPA has not recommended a conversion factor between total and dissolved forms of aluminum. In addition, USEPA's recommended criterion is for pH between 6.5 and 9. Many West Virginia streams are at lower pH, at which the criterion does not protect aquatic life from toxic forms of aluminum.

[27] EQB voted to change this criterion to the federal standard on April 17, 2003.

Recommendations

EQB

- Ensure that all water quality criteria comply with federal guidance, or provide sound scientific reasons why other criteria are valid for West Virginia.

USEPA

- Disapprove West Virginia's pH, turbidity, iron, manganese, and aluminum standards, and promulgate new standards that are consistent with federal guidance.

2.4 Permits do not always protect water quality

According to the CWA, permits must be written to protect water quality and uses in receiving waters; however, DEP does not always comply with this mandate. Although DEP's practices are improving over time, permit writers still issue TBELs—along with alternative storm limitations—in cases where stricter WQBELs are needed to protect receiving streams.

"Although DEP's practices are improving over time, permit writers still issue TBELs—along with alternative storm limitations—in cases where stricter WQBELs are needed to protect receiving streams."

The first step in calculating appropriate WQBELs is to determine if the receiving water is impaired. If it is impaired, then certain procedures must be followed to ensure that permitted discharges do not cause the impairment to worsen, or, if a TMDL cleanup plan is in force, that the discharges are reduced as prescribed in the plan. If the receiving water meets water quality standards, then certain procedures must be followed to ensure that it continues to do so. This section considers each of these three key issues: determining impairment, permitting in impaired waters, and permitting in waters that meet standards.

Determining if receiving waters are impaired

DEP takes several steps to determine if receiving waters are impaired. The CWA requires the agency to compile a list of impaired waters called the 303(d) list. Permit writers can use this list to help determine whether or not receiving streams are impaired, and if so, for what pollutants.

A second method for determining impairment, at least when considering applications to renew or modify existing permits, is to check the instream water quality data typically required to be submitted by permittees in their monthly discharge monitoring reports. Comparisons of these data against state water quality standards should demonstrate how often each standard is met; data collected upstream and downstream from the discharge should help determine whether or not the mining operation is to blame for violations.

A third opportunity stems from the antidegradation implementation procedures, which require new and expanded dischargers to collect baseline water quality data before permits are issued. These data are used in the antidegradation process to determine whether or not standards are being met for pollutants that are proposed to be discharged.

Despite these range of methods available for determining impairment, several types of impaired waters may not be identified because of inadequate data: waters where existing data are old, waters where data have not been collected to satisfy antidegradation procedures, waters with only a few

"...several types of impaired waters may not be identified because of inadequate data...If impairment is not determined correctly, discharge limits will not be calculated correctly."

documented violations that are not on the 303(d) list,[28] and waters where instream data collection is not required of the permittee. In addition, the lack of focused sampling during rainfall suggests that the data that are collected and assessed are biased toward the times when some active mines are least likely to discharge. If impairment is not determined correctly, discharge limits will not be calculated correctly.

Recommendation

DEP

- Ensure that enough recent data are available to determine whether receiving streams are impaired for all relevant pollutants. Data must be collected at base flows and high flows so that each stream's true critical conditions are considered (See Section 3.2). Permits should not be issued until these data are collected.

Permit limits in impaired waters

If a receiving water is impaired, WQBELs must be issued. Different practices are used to calculate these limits before and after TMDLs are completed.

Before TMDLs are completed

If a water is impaired but a TMDL has not yet been completed, federal regulations prohibit discharges that cause or contribute to violations of water quality standards.[29] Recently, DEP has started to issue permits in these waters by calculating WQBELs for some, but not all, of these discharges to ensure that end-of-pipe discharges meet water quality criteria without any dilution in receiving streams (Politan et al., 2002). Although this practice ensures that permitted discharges will not *cause* violations, it still enables additional loads to be discharged, and these loads will *contribute* to violations. Permitting new loads into impaired waters before TMDLs are developed violates federal regulations.[30]

"Permitting new loads into impaired waters before TMDLs are developed violates federal regulations."

Recommendations

DEP

- Do not issue new permits for discharges into impaired streams until TMDLs have been developed that include allocations for new permits.
- Require fact sheets to assess stream impacts and the reasonable potential for discharges to violate standards. Fact sheets for new permits, renewals, and modifications should show calculations of WQBELs for each pollutant, demonstrate how these WQBELs will protect uses, and discuss why these WQBELs are or are not included in the draft permit.

After TMDLs are completed

TMDL cleanup plans developed for AMD typically determine the total amount of iron, aluminum, and manganese that can be discharged to waters while still meeting water quality standards. These allowable loads are then allocated to sources of AMD: abandoned mine lands, bond forfeiture sites, and permitted active coal mining operations.

As shown in Table 4, many AMD TMDLs have been completed in West Virginia. Most target active coal mining operations for at least a portion of the necessary pollutant reductions. To conform with federal regulations, targeted permits must then be modified by calculating WQBELs that reflect the wasteload allocations (WLAs) assigned in the TMDLs. This section documents that these required WQBELs have not been incorporated into permits.

[28] A certain percentage of samples must show a violation in order for a stream to be placed on the 303(d) list.
[29] 40 CFR 122.44.
[30] Clean Water Act regulations at 40 CFR 122.4(i) prohibit these new discharges.

Of the AMD TMDLs completed in 1998, only the Tenmile Creek TMDL called for a point source reduction. Only in June 2001—three years after the publication of the TMDL—did DEP revise the permit targeted by the TMDL. The permit holder, Upshur Property, then appealed its permit to the West Virginia Environmental Quality Board (EQB, 2001). In September 2001, Upshur and DEP agreed to a consent order that delayed the final implementation of aluminum and manganese limits until December 2002, to allow time for additional water quality monitoring (DEP, 2001).[31] As of January 2003, however, the aluminum and manganese limits still have not been incorporated into the permit. After the publication of the TMDL, Upshur was given almost four years to devise a solution to the challenge of treating aluminum and manganese to the required limits. The fact that DEP has still not revised this permit to conform to the TMDL demonstrates a lack of will to implement point source reductions required by TMDLs.

"The fact that DEP has still not revised this permit to conform to the TMDL demonstrates a lack of will to implement point source reductions required by TMDLs."

Table 4: Completed AMD TMDLs in West Virginia

Impaired water	Year
Buckhannon River	1998
Tenmile Creek	1998
Cheat River and tributaries	2001
Elk River and tributaries	2001
Paint Creek and tributaries	2001
Stony River and tributaries	2001
Tygart River and tributaries	2001
Dunloup Creek and tributaries	2002
Monongahela River and tributaries	2002
Tug Fork River and tributaries	2002
West Fork River and tributaries	2002

Sources: USEPA, 1998a-b, 2001a-d, and 2002c-f; DEP and USEPA, 2001.

The AMD TMDLs completed in 2001 affect numerous point sources. With the exception of Cheat River watershed permits,[32] DEP has stated its intention to incorporate these reductions into NPDES permits when they are up for renewal under the state's watershed management framework permit reissuance cycle in 2002 (Politan et al., 2002).

To evaluate DEP's success in modifying permits as required by TMDLs, a random sample of the coal mining NPDES permits in the Tygart River watershed was assessed. One-quarter of the permits targeted for restrictions in the Tygart River TMDL, plus one-quarter of the permits listed in the TMDL but left without new WLAs, are included in this survey.[33]

[31] Treatment of aluminum to low levels affects the treatment for manganese; therefore, while the TMDL does not call for reductions in manganese discharge limits, the TMDL indirectly affects the ability of the permittee to meet its manganese limits.

[32] In the Cheat TMDL, USEPA instructs DEP not to implement the TMDL's point source reductions: "EPA suggests that the WVDEP defer action on permit reissuances through a (sic) short-term administrative permit extensions in this watershed." (USEPA, 2001b, p. 9-27). USEPA has indicated that it will redo the Cheat TMDL based on an improved model, and its suggestion not to implement point source reductions may turn out to be temporary. As of December 2002, however, the revised Cheat TMDL has not been released, and these permits remain in limbo.

[33] Only active permits for underground and surface mines were included in this assessment. Permits for preparation plants, haul roads, quarries, and prospecting were ignored, as were permits that are inactive, revoked, or at some phase of bond release.

As shown in Table 5, none of the ten randomly selected permits had been updated by mid-January 2003,[34] even though the TMDL was released in March 2001 and DEP had committed to updating these permits in 2002. Again, as with the single permit targeted by an AMD TMDL in 1998, DEP's commitment to promptly issue WQBELs based on TMDLs is not apparent. The result: permit limits remain weak and impaired stream segments in the Tygart watershed remain polluted, even after the TMDL has been developed.

"...none of the ten randomly selected permits had been updated by mid-January 2003, even though the TMDL was released in March 2001 and DEP had committed to updating these permits in 2002...The result: permit limits remain weak and impaired stream segments in the Tygart watershed remain polluted, even after the TMDL has been developed."

Recommendation

DEP

- In impaired waters after TMDLs are completed, promptly incorporate WLAs into NPDES permits during the next permit reissuance cycle.

Table 5: Selected Tygart River watershed coal-mining NPDES permits

Permittee	NPDES Permit ID	Permit updated after TMDL?
Permits with WLAs assigned in TMDL		
Ali Co.	WV1017331	No
Philippi Development, Inc.	WV0043273	No
Bass Energy, Inc.	WV0027031	No
Bentley Coal Company	WV1003500	No
Three-C Mining, Inc.	WV1013858	No
Dana Mining Company, Inc.	WV1011464	No
Dante Coal Company	WV0004421	No
Sharon Coal Co.	WV1007378	No
Other permits in TMDL		
Ten-A-Coal Company	WV1003461	No
Upshur Property, Inc.	WV0061689	No

Sources: DEP, 2000; 1999a-c; 1998b-d; 1996; 1993a-b. WLA = wasteload allocation.

Permit limits in unimpaired waters

Permit limits in unimpaired waters must be calculated, at a minimum, to maintain water quality to meet existing and designated uses and comply with antidegradation requirements.[35] DEP's practices for calculating WQBELs in unimpaired waters has evolved over the last 25 years.

To carry out the mandate of the CWA, permitting authorities must evaluate the potential impacts of discharges to receiving streams. The key task is to anticipate the water quality impacts over critical flows to the receiving stream for a specific discharge, considering other contributing sources of pollution.[36] While this is done now in some cases, past permitting practices resulted in WQBELs only for certain classes of discharges, and not for those discharges that were calculated to cause or contribute to violations of standards based on site-specific calculations.

Prior to 2002

During the mid-1980s, virtually all NPDES permits for coal operations were routinely given TBELs, thus ignoring impacts to receiving streams. During the late 1980s, DEP began to issue a few WQBELs, and in the mid-1990s DEP established additional policies for their issuance. WQBELs were required for new

[34] Permit files in DEP's Philippi Field Office were reviewed on January 18, 2003.
[35] 40 CFR 122.44 (d); 40 CFR 131.12.
[36] 40 CFR 122.44(d)(ii).

outlets discharging over 500 gallons per minute[37] and for instream sediment ponds that drained over 250 acres.[38] There is no scientific justification for this arbitrary 250 acre limitation. WQBELs were also issued for discharges to year-round native brook trout streams, as verified by the West Virginia Division of Natural Resources (see Section 2.6). Together, these policies required WQBELs for certain classes of discharges. In contrast to CWA regulations, they were not required for mines when TBELs were not sufficient to protect uses in receiving waters.

WQBELs for sediment-related parameters—TSS and SS—were never issued. Coal's illegal exemption from the state turbidity standard and the lack of specific water quality criteria for TSS and SS are cited as justifications for this policy (Politan, 2002).

New policies in the 1990s resulted in WQBELs for about one-third of all outlets, with most of these limits applying to discharges from instream treatment ponds (See Section 2.5 for on outline of the legal issues on instream ponds) (Politan et al., 2002). While permitting practices improved to some degree since the mid-1980s, DEP still used a cookie cutter approach to permitting: Permit writers evaluated the placement of sediment ponds or the drainage areas of discharges, but did not assess the impacts of discharges on receiving streams. In all but a small handful of cases, antidegradation requirements were also ignored, when permit limits were calculated before 2002 (Politan, 2002). Because of these practices, DEP issued less stringent TBELs in many cases where stricter WQBELs were required to meet water quality standards and to prevent degradation. DEP's permitting practices continue to evolve.

"DEP issued less stringent TBELs in many cases where stricter WQBELs were required to meet water quality standards and to prevent degradation."

2002 and Beyond

In 2001, the West Virginia legislature passed weak and illegal antidegradation implementation procedures.[39] DEP is now developing detailed guidance on the procedures; the guidance is expected to be completed in 2003 (Politan et al., 2002). In the meantime, the agency has begun to implement antidegradation. Until all guidance is finalized and implemented, DEP's permitting practices remain unpredictable.

Antidegradation implementation has the potential to improve DEP's NPDES permitting practices for new or expanded activities: DEP intends to issue permits with WQBELs when TBELs are predicted to degrade a stream by more than 10 percent.[40] Significantly, these permits would not include alternative precipitation limits.

While assigning WQBELs to the majority of new NPDES permits is a positive change, it does not meet the federally required minimum antidegradation standards outlined in the CWA.[41] Antidegradation is intended to weigh the public costs and benefits for every discharge. If a discharge that degrades a stream does not result in a clear overall public benefit, it should not be permitted. If better, economically feasible pollution control technologies are available, they must be used.

Recent state guidance for antidegradation implementation sets weak standards for baseline water quality assessment, socio-economic review, intergovernmental coordination, public participation, and reasonable

[37] Very few, if any, surface mines are known to discharge over 500 gpm; approximately 100 pumped discharge outlets from underground mines discharge over 500 gpm (Politan et al., 2002).
[38] WQBELs could be issued for instream ponds draining between 200 and 250 acres at the discretion of the permit writer.
[39] 60 CSR 5.
[40] WQBELs are not issued for minor outlets that discharge directly from benches.
[41] 40 CFR 131.12.

alternatives analysis (WVDEP, 2002b). These weak policies indicate that the antidegradation review process, once finalized, will be a rubber stamp that allows dischargers to continue to pollute without valid socio-economic analyses, meaningful public participation, or true assessments of pollution control alternatives.

"These weak policies indicate that antidegradation review process, once finalized, will be a rubber stamp that allows dischargers to continue to pollute without valid socio-economic analyses, meaningful public participation, or true assessments of pollution control alternatives."

Recommendations

DEP

- In unimpaired waters, calculate WQBELs for all discharges—whether or not they are existing, new, or expanded—and issue WQBELs when necessary to protect receiving streams.
- Evaluate sediment impacts to streams and issue WBELS for TSS where appropriate.
- Implement antidegradation in a manner that is consistent with federal law. Do not weaken West Virginia's illegal antidegradation rules by issuing faulty guidance, which would turn antidegradation reviews into rubber stamps for business as usual.

2.5 Streams are used exclusively for waste assimilation and treatment

The objective of the CWA is: "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[42] In concert with that principal, states are required to designate stream uses that "protect the public health or welfare [and] enhance the quality of water."[43] Federal and state regulations clearly ban waste transport and waste assimilation as primary stream uses.[44]

However, DEP commonly permits mining operations to build sediment ponds directly in streambeds and below valley fills, transforming streams from free-flowing, biologically rich habitats into waste assimilation and treatment systems. About one-third of the coal NPDES permits issued in West Virginia apply to these instream ponds (Politan et al., 2002).

During mountaintop removal mining, stream segments and instream sediment ponds immediately downstream from valley fills are also used as waste treatment systems. Because untreated waste is discharged directly into these streams and ponds, they do not and cannot meet water quality standards or support beneficial public uses. Thus, all discharges to instream sediment ponds or stream and pond treatment complexes below valley fills are illegal and undermine the primary goals of the CWA.

Recommendation

DEP

- Stop permitting new discharges from instream treatment ponds and treatment systems below valley fills, and phase out existing permits for these discharges. Require all waste treatment to occur adjacent to, and not in, streams.

[42] 33 U.S.C. § 1251(a).
[43] 33 U.S.C. § 1313(c)(2)(A).
[44] 40 CFR 131.10, 46 CSR 1.6.1.a.

2.6 *Trout streams are not fully protected*

The CWA requires permits to be written to protect both existing stream uses and uses designated by the state. Existing uses include those met since 1975, whether or not they have been designated by the state.

West Virginia's water quality standards include a designated use to protect trout waters.[45] This use applies to the over 100 trout streams listed in the state water quality standards,[46] as well as to any other trout stream that is not specifically listed. Stringent water quality criteria for these waters provide special protection from excess sediment, heat, and chemical pollutants in order to preserve trout habitat, assure reproduction, and prevent mortality.

While this scheme should protect trout streams from pollution, it does not. When DEP writes NPDES permits for coal operations, it recognizes only those trout streams currently inventoried by the West Virginia Division of Natural Resources as native brook trout habitat (Politan et al., 2002), thereby ignoring designated trout streams and streams with existing trout uses. DEP, in fact, is removing uses solely at its discretion, counter to a clear CWA mandate that use removals must follow strict protocols called use attainability analyses.[47] DEP's policy not only severely limits protection for trout habitat, but also excludes the public and other agencies from a crucial decision-making process required for removing uses.

"DEP's policy not only severely limits protection for trout habitat, but also excludes the public and other agencies from a crucial decision-making process..."

A second flaw in DEP's permitting practices undermines protections for trout streams as well. The state water quality criterion for turbidity exempts coal mining operations.[48] Although this exemption does not apply in trout streams, coal mining operations that discharge to trout waters are still routinely assigned TBELs for sediment, including alternative storm limitations (Politan, 2002). The agency requires no special efforts to control sediment discharges to trout waters, despite the fact that coal mining operations are legally required to prevent sedimentation in these sensitive streams.

Recommendation

DEP

- Protect all trout streams. Identify all existing and designated trout uses when issuing NPDES permits by checking EQB designations and verifying uses since 1975. Require WQBELs when necessary for iron and TSS in all trout streams so that habitat and reproduction are adequately protected.

[45] 46 CSR 1.6.3.b.
[46] 46 CSR 1 Appendix A.
[47] 40 CFR 131.10(g).
[48] 46 CSR 1 Appendix E, Table 1, Section 8.32 and 8.32.1.

3. PERMIT MONITORING IS INSUFFICIENT

All NPDES permits require self-monitoring to ensure that permit limits are met. End-of-pipe monitoring is used to compare directly with permit limits. In addition, instream monitoring is often used to ensure that permitted discharges are not causing violations of water quality standards in receiving streams. Current permitting practices are insufficient in both of these cases.

3.1 End-of-pipe monitoring is not representative

To be useful in ensuring compliance, monitoring data must provide an accurate picture of what is being discharged. Current practices, however, do not guarantee that these data are representative. DEP generally requires routine end-of-pipe monitoring only twice a month, and permittees need not monitor parameters that are granted rainfall exemptions at the time that samples are taken.[49]

As described in Section 2.1, coal TBELs are weak when it rains because few discharge limits apply. During these times when the discharges are the greatest and the least restricted, they are also not effectively monitored. DEP does not require additional monitoring during storm events (Politan et al., 2002); therefore, data about peak flows from TBEL permits do not exist.

"During these times when the discharges are the greatest and the least restricted, they are also not effectively monitored."

For permits assigned WQBELs, DWR generally requires more thorough monitoring because the limits are in force even when it rains. Thus, some information on peak discharges should be obtained as random twice-a-month sampling theoretically coincides with at least some storm events. Still, permits assigned WQBELs do not require monitoring during storms. Without regularly collected data that are representative of discharges over all precipitation intensities, it is difficult if not impossible to assess the impacts of active coal mines on our rivers and streams.

The paucity of accurate monitoring data is compounded by another DEP policy. If an outlet does not discharge on the day that samples are collected, permittees record "no flow" on their monitoring report, whether or not "no flow" is truly representative of the discharges over the entire month. While this practice appears to be in violation of the federal requirement for representative monitoring,[50] it is sanctioned by DEP (Politan et al., 2002).

In addition, it is up to the permittee to document the intensity of storms and the corresponding permit limits that apply. DEP never verifies rainfall measurements unless an inspector happens to be onsite for a routine inspection during a storm (Politan et al., 2002).

[49] 40 CFR 122.44(i).
[50] 40 CFR 122.41.

Recommendations

DEP

- Require more frequent monitoring of discharges, including daily monitoring for large mines.
- Require monitoring during storms for all permits and for all relevant parameters, even if those parameters are not limited at the time of the sampling.
- Verify rainfall measurements to ensure that rainfall exemptions are being accurately reported.
- Conduct additional compliance monitoring to verify monitoring reports and reported "no flow" conditions.
- Require truly representative monitoring. No longer allow permittees to report "no flow" just because no flow was observed during one particular day of the month, unless this condition is representative of the conditions found over the entire month.

3.2 Instream monitoring is not performed when it counts

"There are little or no publicly available data that accurately assess the impacts from coal mines to receiving streams, and there is no way to determine whether discharges cause or contribute to violations of water quality standards or if stream uses are protected."

The episodic nature of precipitation-induced pollutant discharges makes it unlikely that instream data collection, without a focused storm sampling component, can accurately assess pollutant loads generated by precipitation (Gillies, 2003). While coal operations are often required to collect instream data and DEP occasionally performs its own instream sampling, the agency has performed no focused storm sampling downstream from coal mines (Campbell and Montali, 2003). Even the recent mountaintop removal environmental impact statement did not include a storm sampling focus in its study of water quality impacts in receiving streams (Bryant et al., 2002). The bottom line: There are little or no publicly available data that accurately assess the impacts from coal mines to receiving streams, and there is no way to determine whether discharges cause or contribute to violations of water quality standards or if stream uses are protected.

Recommendations

DEP

- Require instream storm sampling below outfalls as part of routine instream monitoring conditions in NPDES permits.
- Collect storm data below coal mining discharge points. To assess the true impacts of active mining operations on receiving streams, storm data must be collected. Independent, systematic data collection and analysis during and after precipitation events will show mining operations' true impact on receiving streams.
- Do not write TMDL cleanup plans or assign load reductions without an accurate assessment of contributions from active mines. Only by ascertaining the true critical conditions of receiving waters, and by measuring each mine's actual loads during a range of precipitation events, can accurate TMDLs be written.

4. CONCLUSIONS AND RECOMMENDATIONS

Many of DEP's permitting practices do not conform to those required by the CWA, and therefore do not protect our rivers and streams from pollution from coal mines. But DEP does not operate in a vacuum; EQB and USEPA also share the responsibility to ensure that coal mining operations are held to minimum federal standards. If these agencies were to simply follow the law, permitted discharges—and West Virginia's rivers and streams—would be cleaner. There are many reasons why weak permits continue to be written. Improvements must be made.

4.1 DEP

This report documents several deficient permitting practices at DEP. The agency fails to write permits that restrict the discharge of toxic metals like selenium, even when mining is likely to cause instream violations. Permit writers do not routinely assess the reasonable potential for permitted discharges to cause or contribute to violations of water quality standards. CWA mandates are ignored, such as the prohibition against permitting new loads into impaired waters before TMDL cleanup plans are developed. In addition, the agency has not followed through on its commitment to implement these river cleanup plans.

DEP's new antidegradation guidance further weakens existing procedures and will make antidegradation review a rubber stamp for dischargers. Also, counter to the fundamental goals of the CWA, the agency sanctions the use of streams for waste disposal by issuing permits for instream sediment ponds, and fails to recognize and protect all existing and designated trout streams.

Because of DEP policies, permittees' monitoring requirements are inadequate to characterize the discharges or impacts to receiving streams, especially when it rains. No focused instream storm studies have been conducted by the agency to fully characterize the impacts of mining discharges on any of the rivers or streams in coal-producing areas of West Virginia.

DEP must, at a minimum, take several steps to ensure that coal mining permits protect water quality as required by federal law:

<u>Strengthen permits</u>

- **Issue permits without alternative storm limitations.** Until research demonstrates that pollutant loads discharged during storms do not impair receiving waters, these exemptions cannot be justified.
- **Assign appropriate discharge limits for toxic metals.** In particular, determine which coal operations have the potential to cause or contribute to violations of the selenium criterion, and promptly issue stringent selenium limits to prevent these violations from continuing. Rather than waiting for existing permits to be renewed, immediately reopen suspect permits.
- **Do not issue new permits for discharges into impaired streams until TMDLs have been developed that include allocations for new permits.**
- **Require fact sheets to assess stream impacts and the reasonable potential for discharges to violate standards.** Fact sheets for new permits, renewals, and modifications should show calculations of WQBELs for each pollutant, demonstrate how these WQBELs will protect uses, and discuss why these WQBELs are or are not included in the draft permit.
- **In impaired waters after TMDLs are completed, promptly incorporate WLAs into NPDES permits during the next permit reissuance cycle.**

- **In unimpaired waters, calculate WQBELs for all discharges—whether or not they are existing, new, or expanded—and issue WQBELs when necessary to protect receiving streams.**
- **Evaluate sediment impacts to streams and issue WBELS for TSS where appropriate.**
- **Stop permitting new discharges from instream treatment ponds and treatment systems below valley fills, and phase out existing permits for these discharges.** Require all waste treatment to occur adjacent to, and not in, streams.
- **Protect all trout streams.** Identify all existing and designated trout uses when issuing NPDES permits by checking EQB designations and verifying uses since 1975. Require WQBELs when necessary for iron and TSS in all trout streams so that habitat and reproduction are adequately protected.

Improve monitoring

- **Ensure that enough recent data are available to determine whether receiving streams are impaired for all relevant pollutants.** Data must be collected at base flows and high flows so that each stream's true critical conditions are considered. Permits should not be issued until these data are collected.
- **Require more frequent monitoring of discharges, including daily monitoring for large mines.** Twice-per-month monitoring is not frequent enough to truly characterize the variable discharges from coal mines. Daily monitoring should also be required in watersheds where multiple mines may have cumulative impacts.
- **Require monitoring during storms for all permits and for all relevant parameters, even if those parameters are not limited at the time of the sampling.** It is important to know what is actually being discharged from coal mines. These data are crucial for determining the receiving stream's true critical condition, for making accurate 303(d) listing decisions, and for developing realistic TMDL cleanup plans.
- **Verify rainfall measurements to ensure that rainfall exemptions are being accurately reported.**
- **Conduct additional compliance monitoring to verify monitoring reports and reported "no flow" conditions.**
- **Require truly representative monitoring.** No longer allow permittees to report "no flow" just because no flow was observed during one particular day of the month, unless this condition is representative of the conditions found over the entire month.
- **Require instream storm sampling below outfalls as part of routine instream monitoring conditions in NPDES permits.**
- **Collect storm data below coal mining discharge points.** To assess the true impacts of active mining operations on receiving streams, storm data must be collected. Independent, systematic data collection and analysis during and after precipitation events will show mining operations' true impact on receiving streams.

Other recommendations

- **Consider enforcement actions.** When violations of the selenium criterion can be directly linked to a permitted discharge, enforcement actions may be warranted.
- **Implement antidegradation in a manner that is consistent with federal law.** Do not weaken West Virginia's illegal antidegradation rules by issuing faulty guidance, which would turn antidegradation reviews into rubber stamps for business as usual.
- **Do not write TMDL cleanup plans or assign load reductions without an accurate assessment of contributions from active mines.** Only by ascertaining the true critical conditions of receiving waters, and by measuring each mine's actual loads during a range of precipitation events, can accurate TMDLs be written.

4.2 EQB

EQB plays a key role in setting water quality standards, the underpinning of all permitting decisions. However, standards for coal-related parameters do not meet federal guidance or protect stream uses. The board should:

- **Ensure that all water quality criteria comply with federal guidance, or provide sound scientific reasons why other criteria are valid for West Virginia.** Criteria must be based on 304(a) guidance from USEPA or other scientifically defensible methods.[51] EQB must ensure that all criteria comply with requirements of the CWA.

4.3 USEPA

Federal regulations for coal mines exempt most coal mining operations from meaningful discharge limits when it rains, and are based on USEPA's lenient interpretation of the CWA. To promote better permitting practices in West Virginia, the agency should:

- **Review federal effluent limitation guidelines for coal mining and remove the alternative storm limitations.** The failure of coal TBELS to protect water quality during precipitation necessitates removing these exemptions. Improved treatment systems should be required to ensure that water quality standards are met.
- **Disapprove West Virginia's pH, turbidity, iron, manganese, and aluminum standards, and promulgate new standards that are consistent with federal guidance.**

4.4 Citizens' groups

About 90 grassroots watershed organizations are active across West Virginia; many of these groups are dealing with pollution from coal mining. These citizens have a major stake in improving permitting practices so that permits for coal mining operations truly protect local rivers and streams.

Grassroots organizations often hold a wealth of knowledge about local water issues; focusing in more detail on the technical and policy issues surrounding coal mining NPDES permits will allow them to participate more effectively in NPDES permitting processes. Citizens' groups can take the following actions:

<u>Gather background information</u>

- **Identify NPDES permits for coal mines in the watershed.** Try an online search on DEP's Web site, or a Freedom of Information Act request to DEP. The West Virginia Rivers Coalition and the Appalachian Center for the Economy and the Environment can help with technical, legal, or policy questions.
- **Identify all known or listed trout streams in the watershed.** West Virginia's water quality standards includes a list of known trout waters. The West Virginia Division of Natural Resources conducts periodic fish monitoring and maintains an updated list. The West Virginia Chapter of Trout Unlimited, as well as local anglers, have a wealth of local, up-to-date information.
- **Identify all streams in the watershed on the 303(d) list for AMD-related impairments.** DEP must develop TMDL cleanup plans for these streams.
- **Get copies of all completed AMD TMDL cleanup plans in the watershed.** TMDLs may include stricter permit limits for coal mining operations.
- **Determine if coal seams in the area are likely to be high in selenium.** Check the West Virginia Geologic and Economic Survey's Web site.[52] If high selenium coal seams are found, ask DEP to

[51] 40 CFR 131.11.

[52] www.wvgs.wvnet.edu/www/datastat/te/SeHome.htm.

require water quality–based limits for selenium and to require selenium monitoring of permitted discharges and of the receiving stream.

Collect detailed information

- **Examine permits to ensure that discharge limits protect the uses of local streams.** At the very least, permits must protect existing uses and those uses designated by the State. All known or listed trout streams, including any stream that has supported trout since 1975, must be afforded special protections.
- **Collect permit monitoring data and compare it with permit limits.** Permit monitoring data are submitted monthly to DEP in discharge monitoring reports, and can be examined at DEP or requested under the Freedom of Information Act. Get these data for permits of interest, and ensure that permit limits are being met. Note when permittees report "no flow" and when they fail to submit their data.
- **Ensure that permit violations are enforced.** DEP can enforce all permit limits through a number of mechanisms, including fines. Any organization or individual can also force permittees in violation of their permits to comply through the CWA's citizen suit provision.[53]
- **Gather instream data to check that dischargers are not causing violations of water quality standards.** Instream data may be submitted by permittees to DEP as one component of their discharge monitoring reports. DEP, university researchers, or others may have also collected useful local data. Consider starting a local citizen monitoring program. Compare instream data to state numeric and narrative criteria to ensure that the uses of the stream are being protected.
- **Collect downstream data during precipitation events to see if water quality standards are being violated.** Most discharges from surface mines occur when it rains, and dischargers and DEP are responsible for ensuring that water quality standards are met downstream. Consider testing for iron, aluminum, manganese, and sediment during rainfall events. If resources allow, hire a professional to design and implement a focused rainfall sampling study of your watershed.
- **Periodically collect macroinvertebrate data to help evaluate the biological integrity of streams.** Insects and other organisms that can be seen with the naked eye, called benthic macroinvertebrates, can suggest whether or not a stream is degraded, even if current chemical conditions do not show water quality standard violations.
- **Install a simple rain gauge on your property and record daily rainfall amounts.** Match these data against permittees' discharge monitoring report data to ensure that dischargers do not try to take advantage of alternative precipitation limitations when no rainfall, in fact, occurred. Also check that permittees do not report "no flow" during periods of high rainfall, when it is likely that discharges are, indeed, occurring.

Participate in the NPDES permitting process

- **Comment on new, reissued, and modified local permits.** Base your comments on the background information and detailed data collected according to the previous recommendations. You may decide to provide monitoring data, even if you think DEP is already aware of it. Make sure that permit writers are aware of any violations that have occurred over the last few years. Request WQBELs for parameters where data show even one violation of the applicable criterion in the receiving stream. Be especially careful about discharges to trout streams.

[53] 33 U.S.C. § 1365.

4.5 Summary

While DEP has committed to some improvements in the way coal permits will be written in the future, permits still will not comply with the mandates of the CWA. It is too early to tell if improvements will actually decrease the amount of pollution coming from coal mining operations.

Truly protective permits will only be written when adequate monitoring fully characterizes mining discharges and their impacts to receiving streams. Protective permits will also only be written when DEP, EQB, and USEPA improve state water quality criteria, antidegradation implementation procedures, and guidelines for issuing effluent limitations to ensure that coal mining operations are held to CWA standards.

Changes in permitting policies at DEP to conform to existing laws are also necessary to ensure that the coal mining industry is held accountable for its water pollution just as every other industry in the country. Improvements will take political will, commitment, and leadership.

REFERENCES

American Rivers. 2002. American Rivers - #6 Coal River (WV). www.americanrivers.org/mostendangered/coal2000.htm.

Bonds, Judy. 2002. Community Outreach Coordinator, Coal River Mountain Watch. Telephone call with author Janes. December 31.

Bryant, Gary, Scott McPhilliamy, and Hope Childers. 2002. *A Survey of the Water Quality of Streams in the Primary Region of Mountaintop Valley Fill Coal Mining: October 1999 to January 2001.* USEPA Environmental Services Division. Region 3. April 8.

Campbell, Pat. 2002. Assistant Chief, DEP Division of Water Resources. Telephone conversation with author Janes. December 18.

Campbell, Pat and Dave Montali. 2003. Assistant Chief, DEP Division of Water and Waste Management and TMDL Program Manager. Telephone conversation with author Janes. January 2.

Capacasa, John M. 2003. Acting Director, Water Protection Division, USEPA Region 3. Letter to Ed Snyder, Chairman, EQB. April 17.

Chatfield, Libby. 2002. Technical Advisor, EQB. Telephone call with author Janes. December 20.

Gillies, W. Neil. 2003. Executive Director, Cacapon Institute. E-mail to the author Janes. January 1.

Janes, Margaret C. 2002. Senior Policy Analyst, Appalachian Center for the Economy and the Environment. Petition to Donald S. Welsh, Regional Administrator, USEPA Region 3. July 23.

Laskowski, Stanley. 1994. Acting Regional Administrator, USEPA Region 3. Letter to David Samuel, Chairman, EQB. January 10.

Lemly, Dennis A. 2002. *Selenium in Aquatic Ecosystems: A Guide for Hazard Evaluation and Water Quality Criteria.* New York: Springer.

McElfish, James M., Jr. and Ann E. Beier. 1990. *Environmental Regulation of Coal Mining: SMCRA's Second Decade.* Washington, DC: Environmental Law Institute.

National Research Council (NRC). 2002. *Coal Waste Impoundments: Risks, Response, and Alternatives.* Committee on Coal Waste Impoundments, Committee on Earth Resources, Board of Earth Sciences and Resources, Division of Earth and Life Studies. Washington, DC: National Academy Press.

Politan, Ken. 2002. Assistant Director, DEP Division of Mining and Reclamation. Letter to author Janes. November 6.

Politan, Ken, Butch Borth, and Margaret Miller. 2002. Assistant Director, DEP Division of Mining and Reclamation, Environmental Resource Program Manager, and Environmental Resource Specialist. Telephone call with authors. December 10.

Stuhltrager, James. 2003a. Attorney, Mid-Atlantic Environmental Law Center. West Virginia Rivers Coalition vs. Christine Todd Whitman, Administrator, USEPA. February 25.

Stuhltrager, James. 2003b. Attorney, Mid-Atlantic Environmental Law Center. Notice of intent to sue Christine Todd Whitman, Administrator, USEPA. February 27.

United States Environmental Protection Agency (USEPA). 1982. *Development Document for Final Effluent Limitations Guidelines, New Source Performance Standards, and Pretreatment Standards for the Coal Mining Point Source Category.* Effluent Guidelines Division, Office of Water. September.

_____. 1986. *Quality Criteria for Water 1986; Solids (Suspended, Settleable) and Turbidity.* Office of Water, Regulations and Standards. EPA 440/5-86-001. May 1.

_____. 1998a. *Metals TMDL for Buckhannon River, West Virginia.* Region 3. September.

_____. 1998b. *TMDL for Tenmile Creek, West Virginia.* Region 3. September.

_____. 2001a. *Metals and pH TMDLs for the Cheat River Watershed, West Virginia.* Region 3. March.

_____. 2001b. *Metals and pH TMDLs for the Elk River Watershed, West Virginia.* Region 3. September.

_____. 2001c. *Metals and pH TMDLs for the Stony River Watershed, West Virginia.* Region 3. September.

_____. 2001d. *Metals and pH TMDLs for the Tygart Valley River Watershed, West Virginia.* Region 3. March.

_____. 2002a. *National Recommended Water Quality Criteria: 2002.* Office of Water and Office of Science and Technology. EPA-822-R-02-047. November.

_____. 2002b. Consumer Fact Sheet on Selenium. http://www.epa.gov/safewater/dwh/c-ioc/selenium.html.

_____. 2002c. *Metals, pH and Fecal Coliform Bacteria TMDLs for the Dunloup Creek Watershed, West Virginia.* Region 3. September.

_____. 2002d. *Metals and pH Total Maximum Daily Loads (TMDLs) for the Monongahela River Watershed, West Virginia.* Region 3. September.

_____. 2002e. *Metals and pH Total Maximum Daily Loads (TMDLs) for the Tug River Watershed, West Virginia.* Region 3. September.

_____. 2002f. *Metals and pH Total Maximum Daily Loads (TMDLs) for the West Fork River Watershed, West Virginia.* Region 3. September.

WV Department of Environmental Protection (DEP). 1993a. Permit WV0061689 for Upshur Property, Inc. April 7.

_____. 1993b. Permit WV1007378 for Sharon Coal Co. September 7.

_____. 1996. Permit WV0043273 for Philippi Development, Inc. April 3.

_____. 1998a. *West Virginia 1998 303(d) List.* Division of Water Resources.

_____. 1998b. Permit WV1003461 for Ten-A-Coal Company. June 16.

_____. 1998c. Permit WV1017331 for Ali Co. November 4.

_____. 1998d. Permit WV1003500 for Bentley Coal Company. July 2.

_____. 1999a. Permit WV1011464 for Dana Mining Company, Inc. December 27.

_____. 1999b. Permit WV0004421 for Dante Coal Company. February 2.

_____. 1999c. Permit WV0027031 for Bass Energy, Inc. October 21.

_____. 2000. Permit WV1013858 for Three-C Mining, Inc. September 25.

_____. 2001. Consent Order Issued Pursuant to the Water Pollution Control Act, WV Code, Chapter 22, Article 11, to Upshur Property, Inc. September 21.

_____. 2002a. *West Virginia 2002 303(d) List.* Division of Water Resources.

_____. 2002b. *West Virginia Antidegradation Rule Implementation Guidance.* Chapters 1-9. Division of Water and Waste Management. December.

_____. 2003. Division of Mining and Reclamation Data. http://gis.dep.state.wv.us/data/omr.html.

WV Department of Environmental Protection and U.S. Environmental Protection Agency Region 3 (DEP and USEPA). 2001. *Metals and pH TMDLs for the Paint Creek Watershed, West Virginia.* DEP Division of Water Resources. September.

WV Environmental Quality Board (EQB). 2001. Appeal No. 01-14-EQB. Upshur Property, Inc., Appellant, v. Allyn G. Turner, Director, Division of Water Resources, WV, Department of Environmental Protection, Appellee. July 12.

Wiley, J.B., R.D. Evaldi, J.H. Eychaner, and D.B. Chambers. 2001. *Reconnaissance of stream geomorphology, low streamflow, and stream temperature in the mountaintop coal-mining region, southern West Virginia, 1999-2000.* U. S. Geological Survey. Water Resources Investigations Report 01-4092.

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ENVIRONMENTAL QUALITY BOARD

June 16, 2003

West Virginia Environmental Quality Board
1615 Washington Street East, Suite 301
Charleston WV 25311-2126

RE: TRIENNIAL REVIEW OF WATER QUALITY STANDARDS RULE: COMMENTS RELATED TO NEWLY PROPOSED TROUT WATERS AND FECAL COLIFORM STANDARD MODIFICATIONS

Dear Board:

The Appalachian Center for the Economy and the Environment appreciates the opportunity to comment and asks that these comments be accepted as an addendum to comments previously filed.

Category B-2

The Appalachian Center for the Economy and the Environment appreciates the efforts of the EQB, in conjunction with WVDEP and WVDNR, to review and update the list of streams designated as Category B-2, Trout Waters. While existing uses must always be protected, 40 CFR § 131.12, official designation of these waters will enhance recognition of the trout use and solidify protection. This list should be updated as additional trout waters are identified.

Bacterial Criterion

The Center urges the Board to reconsider proposed modifications to the fecal coliform criterion. The proposed modifications are vague, undermine the existing fecal coliform criterion, subject to multiple interpretations and impossible to legally implement. We ask the board to withdraw these changes, leave the existing fecal coliform criterion intact and over the next year consider reasonable ways to transition to the recommended EPA *E.coli* standard. We suggest the transition should be carried out over a period of two to three years in coordination with WVDEP so that listing of impaired streams on the state's 303 (d) list, TMDLs, evaluation of water quality limited segments, enforcement actions and protection of stream uses and public health are maintained throughout the transition period.

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JUN 18 2003
ENVIRONMENTAL QUALITY BOARD

Bacterial Criterion – Specific Issues

Modifications/additions to the fecal coliform standard during this triennial review state:

> If a sample tested for fecal coliform shows noncompliance with the provisions of this section, then further testing of the sample for *Escheria Coli* can be allowed to determine compliance. If *E. Coli* testing indicates that the sample meets EPA's recommended criteria (1) this will suffice for meeting the criterion.

A straightforward reading of this clause indicates that if sampling demonstrates a violation of the fecal coliform standard, additional tests for E. Coli should be run on *the same sample.* However, samples for fecal coliform and E. coli must be run and processed within 8 hours of collection. Test results typically require an additional 24 to 36 hours. By the time fecal coliform results are obtained the existing sample will be 32 hours old and no longer viable for E. Coli testing. Thus, the proposed amendment to the standard does not comply with EPA testing and handling requirements and cannot be legally implemented.

The other possible, though tortured, interpretation of the proposal is that if a sample violates the fecal coliform standard, *additional water samples could be taken at some future date determined at the sampler's discretion* to substantiate or refute the fecal coliform violation. Thus, the sampler is given sole discretion whether to relegate an EQB promulgated and EPA approved water quality standard to nothing more than a screening tool for future testing for *E. coli.* In addition due to the episodic nature of instream bacterial levels, elevations of 50,000/100 ml one day may be as low as 200/100 ml a day later. Depending on sampling times and conditions, the circumstances of the original violation may be easily lost – thus potentially allowing violators a get out of jail free card for each and every fecal coliform violation.

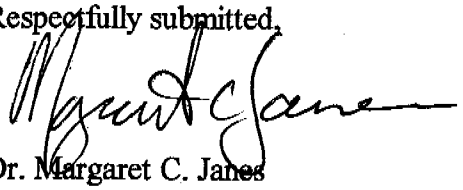
Water quality standards are the backbone of the Clean Water Act. Water quality criteria must be based on 304(a) guidance or on other scientifically defensible methods, 40 CFR 131.11 (a) and (b). In no case does the 1986 EPA Ambient Water Quality Criteria for Bacteria promote a two-tiered approach for establishing bacterial water quality criteria. Indeed, no such approach could have been presented since it cannot be legally implemented, is not scientifically defensible, and does not protect the public uses of our lakes and streams.

Fecal coliform is a critically important standard in West Virginia. A valid bacterial standard is not only important in protecting our premier recreational areas – Seneca, Smoke Hole, the New River, and Blackwater but all of West Virginia's citizens who use and recreate in and on our waterways. A single weekend epidemic of salmonella or campylobacter could have disastrous effects on the health of those

1 Based on a statistically sufficient number of samples (generally not less than five samples equally spaced over a 30 day period), the geometric mean of the indicated bacterial densities should not exceed 126 per 100 ml. No sample should exceed a one sided confidence limit (C.L.) calculated using the following as guidance: designated bathing beach 75% C.L.; moderate use for bathing 82% C.L.; light use for bathing 90% C.L.; infrequent use for bathing 95% C.L.; based on a site-specific log standard deviation or if site data are insufficient to establish a log standard deviation then using 0.4 as the log standard deviation for both indicators.

citizens and on our tourist economy. The Board must reconsider this provision and promulgate a protective and legal standard that can be fairly and easily implemented throughout the State. To foster its long-term economic viability, the State must not weaken the very standards necessary to protect our future.

Respectfully submitted,



Dr. Margaret C. James
Senior Policy Analyst

AQBEQB CLERK - Fw: water quality and gastrointestinal illness

From: Margaret Janes <mjanes@hardynet.com>
To: Libby Chatfield <lchatfield@aqbeqb.state.wv.us>
Date: 6/23/2003 3:53 PM
Subject: Fw: water quality and gastrointestinal illness

Libby - The following abstract evaluates E coli and bacterial indicators and how they relate to GI disease - appears to be an extensive literature review and by reputable institutions. The abstract indicates it is very much on topic. I was unable to download the full article without government ID. If you get the article I would appreciate it if you could send me a copy. I believe this will be helpful to the board during the triennial review and as they consider a possible transition to an E. coli criterion.

Thanks,

Margaret Janes
Appalachian
Center for the Economy and the Environment
mjanes@hardynet.com
304-897-6048
fax 304-897-7110

----- Original Message -----
From: "Alex J Sagady & Associates" <ajs@sagady.com>
To: <mich-cafo-busters@topica.com>;
<cons-CAFO-ACTIVIST@LISTS.SIERRACLUB.ORG>; <cwn-feedlots@igc.topica.com>
Sent: Friday, June 20, 2003 12:58 PM
Subject: water quality and gastrointestinal illness

> Do U.S. Environmental Protection Agency Water Quality Guidelines for
> Recreational Waters Prevent Gastrointestinal Illness? A Systematic Review
> and Meta-analysis
>
> http://ehpnet1.niehs.nih.gov/docs/2003/6241/abstract.html
>
> ----------
--
> Alex J. Sagady & Associates http://www.sagady.com
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> Environmental Enforcement, Permit/Technical Review, Public Policy,

> Evidence Review and Litigation Investigation on Air, Water and
> Waste/Community Environmental and Resource Protection
> Prospectus at: http://www.sagady.com/sagady.pdf
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> PO Box 39, East Lansing, MI 48826-0039
> (517) 332-6971; (517) 332-8987 (fax); ajs@sagady.com
> ==========
>
> Clean Water Network listserves are for CWN members only and messages are intended solely for those environmental activists.
>
>
>
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> This email was sent to: mjanes@hardynet.com
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> EASY UNSUBSCRIBE click here:
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> TOPICA - Start your own email discussion group. FREE!
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STATEMENT OF INDEPENDENT OIL & GAS ASSOCIATION OF WEST VIRGINIA ON PROPOSED REVISIONS TO SURFACE WATER QUALITY STANDARDS – 46 CSR 1 JUNE 18, 2003

Good evening. My name is Jeff Stevens, I am Chairman of the Environmental Committee for the Independent Oil & Gas Association of West Virginia, also known as IOGA. IOGA is a statewide non-profit trade association representing companies engaged in the extraction of natural gas and oil in West Virginia and the companies and individuals which support extraction activities. A part of IOGA's mission is to protect and improve both the business and natural environment of our state. To that end, IOGA has worked closely with the WVDEP and that agency's office of Oil and Gas to ensure the application of reasonable and effective environmental regulatory requirements to oil and gas operations.

In its proposed rules the Board has suggested numerous and significant revisions to the state's water quality standards. Although IOGA will be providing written detailed comments on the proposals to the Board, we would like to address certain of these more significant proposals this evening.

1. We are concerned that the Board is rushing forward unnecessarily in proposing changes to so many criteria at the same time. As we understand EPA policy, the Board is only required to propose standards for those pollutants where available information indicates that the pollutants are **present** or **discharged** in state waters AND that these pollutants can reasonably be expected to interfere with designated uses. IOGA supports the use of a three-step approach to the evaluation of new criteria. **First**, the Board should determine whether, on the basis of available information, such pollutants are present or being discharged in state waters. **Second**, if the finding to the first step is affirmative, the Board should then determine whether these pollutants are present in concentrations that can reasonably be expected to interfere with designated uses. Third, if the second step yields in an affirmative finding, then the Board should determine whether the national criteria should be applied or whether some derived numeric criteria consistent with Clean Water Act requirements would be appropriate for the protection of state water uses.

Just as Governor Wise and Secretary Timmermeyer have urged the Board to act deliberately and with caution on the adoption of harmonic mean design flow, and the Board embraced this approach, we urge the Board to show the same caution and act with deliberation in determining when and whether new criteria are necessary for the protection of West Virginia's waters. We believe the impact to the regulated community from blind adherence to EPA's national criteria will be enormous.

2. IOGA is concerned with the Board's proposal to reduce by 500% Category A and C criteria for arsenic. The proposal would impose the end of tap drinking water limit for arsenic that has been established under the Safe Drinking Water Act. However, in adopting that standard EPA has provided states at least four years before they are required to demonstrate

compliance with the new arsenic standard at the drinking water tap. The Board's proposal would apply that standard **immediately** to the rivers of West Virginia.

We continue to be troubled by the concept of requiring West Virginia businesses to discharge wastewater that is as clean as tap water. However, in addition, we believe EPA would have allowed a four year compliance period on the assumption that water systems were not capable of treating to the level imposed by the new standard immediately. For these reasons we urge the Board to postpone taking action on a new arsenic criteria for Category A and C.

3. IOGA supports the proposed change to Section 8.32.1 which would reference the state's Non-point Source Management Plan as issued by DEP in December 2000. Guidance on the appropriate BMPs to be used at oil and gas operations has been issued by the DEP's Office of Oil and Gas. The control of surface run-off from oil and gas activities has been effectively and efficiently addressed through the use of these BMPs. We support the recognition of the use of such practices under the Turbidity criterion.

4. The Proposed Rule would significantly expand the list of trout waters which currently appears in Appendix A. We are concerned that the Board's proposal to add hundreds of new streams to the trout water category in this single ruling - with a public review period of only thirty days - does not allow sufficient opportunity for concerned members of the public to have meaningful comment on this proposal. Again, we urge the Board to adopt a more deliberate approach on this issue. In particular we recommend that the Board consider providing notice of its proposed actions in the area where the potential waters are located to ensure that members of the public have a meaningful opportunity to address this proposal.

5. The Board has proposed to delete Appendix B, the designation of specific public water supply, from the water quality standards. IOGA opposes this approach and believes it would be more meaningful if the Board would seek to update this Appendix to reflect current public water systems.

IOGA appreciates the opportunity to present these comments to the Board. We also want to thank the individual members of the Board for their dedication and hard work.

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WEIRTON
STEEL CORPORATION

June 23, 2003

Edward M. Snyder, Ph.D., Chair
Environmental Quality Board
1615 Washington Street, East, Suite 301
Charleston, West Virginia 25311-2126

Re: Proposed Revisions to the "Half-Mile Rule" (46 CSR 1, §7.2.a.2); Proposed Revisions to Site Specific Variance for Harmon Creek (46 CSR 1, §7.2.d.16.2)

Dear Dr. Snyder:

These comments are provided on behalf of Weirton Steel Corporation ("Weirton Steel") in response to the public notice filed with the Secretary of State on May 19, 2003, announcing proposed revisions to the state surface water quality standards, 40 CSR 1 ("Proposed Rule"). These comments are directed at two proposed changes that have been requested by Weirton Steel: an amendment to the "Half-Mile Rule," which appears at 40 CSR 1, §7.2.a.2; and a revision to the site specific variance for a segment of Harmon Creek which appears at 46 CSR 1, §7.2.d.16.2 (the "Harmon Creek Variance"). Neither of these provisions is new to the water quality standards, and each provides a more limited exemption or variance than has been previously requested by Weirton Steel, granted by the Board and approved by EPA in previous versions of the water quality standards.

HALF-MILE RULE

The proposed revision to §7.2.a.2 would exempt a small segment of the Ohio River (between mile point 61.0 and 63.5) from the prohibition that would not allow a mixing zone for discharges in this segment because of its proximity to the intake of a public water supply. As the Board is well aware, both the discharge and the water supply intake that occur in this river segment belong to Weirton Steel. During the last twelve months and in prior proceedings before this Board Weirton Steel has provided extensive documentation regarding the nature and characteristics of its discharge within this segment (Outfall 002) as well as data on the quality of the water in Weirton Steel's potable water plant. This information demonstrates that the Weirton Steel discharges are having no adverse impact on the quality of water that is produced at its potable water plant.

Weirton Steel meets water quality criteria end of pipe for all parameters at its discharge from Outfall 002 with the exception of iron. Weirton Steel has expended a great deal of resources and money in its water quality compliance efforts. Evidence of its dedication and success in such efforts is the fact that the Company has consistently decreased the list of parameters for which a variance is sought. Currently, Weirton Steel requests the variance for only one parameter – iron.

Weirton Steel strongly contends that the variance for iron will not adversely impact the quality of water produced at its potable water plant. Thus, the Company voluntarily agreed to provide monthly monitoring for iron in the treated water at the potable water plant with the results of such monitoring to be submitted to the West Virginia Bureau of Public Health and the West Virginia Department of Environmental Protection - Division of Water and Waste Management.

Weirton Steel also has provided the Board with information regarding the status of its discussions with the City of Weirton regarding the use of city water for potable water needs at the Weirton Steel mill. The reality of circumstances in recent years is that the estimated $9 to $10 million that would be necessary to upgrade the City of Weirton's facilities is simply not available now or in the foreseeable future from Weirton Steel or from other sources. Until a source of funding for this upgrade can be identified, more frequent or more extended discussions between Weirton Steel and the City of Weirton on this issue would have no effect on the result. Nevertheless, Weirton Steel will provide a written report regarding the status of its water plant and any issues related thereto on or before March 1, 2007 as provided for in the exemption.

We would like to emphasize that the proposed revision to the Half-Mile Rule does not affect the application of Category A use to this section of the Ohio River. Unlike the prior exemption, the current proposal is limited only to the application of the iron criterion as an end-of-pipe limitation. With this exemption a small mixing zone would be allowed for iron in the Outfall 002 discharge, but, under the requirements of the Weirton Steel WV/NPDES permit, that mixing zone will end prior to the intake for the potable water plant and the iron criterion will have to be met at that point.

HARMON CREEK VARIANCE

The proposed change to §7.2.d.16.2 extends and modifies the water quality variance previously granted by the Board for a small segment of Harmon Creek, a tributary of the Ohio River. Weirton Steel discharges treated wastewater into Harmon Creek through Outlet 004 2.2 miles upstream from the point where Harmon Creek flows into the Ohio River. The Board had previously granted a socio-economic variance pursuant to 40 C.F.R. §131.10(g)(6) for this stretch of Harmon Creek.. Under the Proposed Rule the variance will now be limited to the temperature, iron and lead criteria. Weirton Steel will still be required to make regular reports to the Division of Water and Waste Management regarding the quality of water in the discharge from Outlet 004 and will be required to address efforts made to improve the quality of such discharge.

As is the case with the discharge from Outfall 002 previously discussed, Weirton Steel has spent a great deal of resources in efforts to consistently improve water quality at Outfall 004. Again, evidence of its dedication and success in such efforts is best demonstrated by the fact that the Company has decreased the list of parameters for which a variance is sought. To that end, Weirton Steel has dropped zinc from this current request.

In support of this extension Weirton Steel has provided the Environmental Quality Board and the Division of Water and Waste Management with copies of the following reports:

1. Evaluation of Alternate Control Technologies for Reducing Metals and Temperature in the Wastewater Discharge at NPDES Outfall 004, prepared by S/D Engineers, Inc., May 2, 2003;

2. Ecological Services Report - Drinking Water Intake Survey of Harmon Creek, prepared by EnviroScience, Inc., dated April 2003; and

3. Financial and Socio-Economic Effects of Compliance with West Virginia Department of Environmental Quality Regulations at Harmon Creek, prepared by Robert C. Dresser, Competition Economics, Inc. dated May 2, 2003.[1]

CONCLUSION

With respect to each of the revisions that has been requested by Weirton Steel in addition to the information and submittals mentioned above, Weirton Steel has provided significant documentation to the Board, and has met on several occasions with representatives of the Board, the Division of Water and Waste Management, the Department of Health and Human Services and, by conference call, with representatives of EPA Region III, to explain its rationale for and documentation supporting the requested changes. Through those discussions Weirton Steel has provided responses to all issues raised, which information should be reflected in the Board's file on this matter. Attached to these comments is a copy of the summary presentation made by Weirton Steel to the Board at its meeting on May 8, 2003, which provides additional detail outlining the need and justification for these revisions.

Weirton Steel is very appreciative of the opportunities the Board has provided for making presentations and submittals in support of these changes. We believe that the information provided satisfies all requirements of the Board's regulations and of guidance and requirements of the U.S. Environmental Protection Agency. For these reasons, Weirton Steel urges the Board to finalize the changes to subsections 7.2.a.2 and 7.2.d.16.2, as proposed.

Very truly yours,

Mark Vignovic
Director, Environmental Control Department

[1] In light of Weirton Steel's filing for bankruptcy protection on May 19, 2003, a revised version of this report dated June 19, 2003 evidencing the further deteriorated financial state of the Company is being filed with these comments.

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FINANCIAL AND SOCIOECONOMIC EFFECTS OF COMPLIANCE WITH WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY REGULATIONS AT HARMON CREEK

FINAL REPORT

Prepared for:

Weirton Steel Corporation
400 Three Springs Drive
Weirton, West Virginia 26062

June 19, 2003

Robert C. Dresser
Competition Economics, Inc.
Bethesda, Maryland

TABLE OF CONTENTS

EXECUTIVE SUMMARY –	**3**
CHAPTER 1 – BACKGROUND	**9**
CHAPTER 2 – FINANCIAL EFFECTS	**13**
CHAPTER 3 – SOCIOECONOMIC IMPACT	**19**
Appendix A – Project Costs	**30**
Appendix B – EPA Methodology	**33**
Appendix C – Financial Data for Comparables	**35**

LIST OF EXHIBITS

ES-1 FINANCIAL TEST RESULTS	**5**
ES-2 WSC COMPARED TO THE AVERAGE OF OTHER MAJOR US PRODUCERS	**6**
ES-3 WSC COMPARABLES RANKED BY FOUR EPA-DEFINED FINANCIAL DIMENSIONS	**6**
ES-4 WEIRTON COMMUNITY COMPARED TO USA	**7**
1-1 COST ESTIMATE FOR C&E UPGRADES	**12**
2-1 WSC FINANCIAL INDICATORS BEFORE CONSIDERING THE COSTS OF COMPLIANCE AT HARMON CREEK	**15**
2-2 WSC COMPARED TO OTHER MAJOR INTEGRATED STEEL PRODUCERS	**15**
2-3 WSC FINANCIAL CONDITION RANK	**16**
2-4 TOTAL ANNUAL COST OF HARMON CREEK OUTFALL COMPLIANCE	**17**
2-5 FINANCIAL TEST RESULTS ADJUSTED FOR COSTS OF ACHIEVING THE STANDARDS AT THE HARMON CREEK OUTFALL	**18**
3-1 PRIVATE EMPLOYMENT IN THE STEUBENVILLE-WEIRTON METRO AREA – 2001	**20**
3-2 WSC WAGE EMPLOYEES ESTIMATED WEEKLY EARNINGS (2002)	**22**
3-3 LAID-OFF EMPLOYEES' DISPOSABLE INCOME DROPS DURING PERIOD OF UNEMPLOYMENT	**23**
3-4 ESTIMATED WEEKLY PAY FOR NON-MANUFACTURING PRIVATE EMPLOYEES IN THE STEUBENVILLE-WEIRTON METRO AREA	**24**
3-5 LOSS IN WAGES AND DISPOSABLE INCOME AFTER RE-EMPLOYMENT	**25**

EXECUTIVE SUMMARY

SUMMARY OF FINDINGS

This report presents the findings of Robert Dresser of Competition Economics, Inc. regarding the financial and socioeconomic impact of requiring Weirton Steel Corporation (WSC) to comply with water quality regulations at the Harmon Creek Outfall. This final report includes considerations related to WSC Chapter 11 bankruptcy filing. The key conclusions are:

1. WSC cannot afford to divert the $36.0 million needed to pay for this project to bring Harmon Creek into complete conformity with current state water quality standards because:

- WSC competes in an industry characterized by capital intensity, cyclicality, and strong competition from other domestic producers and importers. To meet this competition, WSC must constantly reinvest operating cash flow in capital improvements. WSC's SEC filings indicate that it has spent about $20 million each year for maintenance of existing operating facilities over the previous three years. This project represents almost two full years of capital spending. (See Chapter 1.1)

- WSC ranks near the bottom among a set of comparable companies along each of the four financial dimensions defined by the USEPA in its guidance for estimating the financial impact of pollution control projects. (See Chapter 2.2)

- The impact of the project is to reduce profitability significantly. Using the EPA prescribed method for assessing the financial impact of the project's costs on WSC, average 2000-2002 profitability would have dropped another percent. (See Chapter 2.3)

2. The loss of jobs at WSC facility would create widespread socioeconomic harm because:

- WSC's location, in the Steubenville-Weirton metropolitan area, places it in an economically depressed community (See Chapter 1.2) where:
  - the unemployment rate in January 2003 was 5% higher than the national average (6.0% versus 5.7%)
  - median per capita income is 22% below the national average
  - the average price of owner-occupied housing is 44% below the nationwide average
  - the metropolitan area population is shrinking due to net out-migration, while the US overall population is growing

- As the largest employer in the metropolitan area, WSC represents about 50 percent of the manufacturing jobs and about 25% of all private employment in Hancock County, West Virginia. It also represents 8 percent of all non-government jobs in the Steubenville-Weirton metropolitan area. As such, WSC plays a larger role in the community than almost any other business. (See Chapter 3)

PURPOSE OF REPORT AND METHODOLOGY

This report analyzes the financial and socioeconomic effects of providing additional treatment at the Harmon Creek Outfall to comply with applicable West Virginia Water Quality Standards.[1] The wastewater discharged by WSC into Harmon Creek exceeds the applicable statewide standards for lead, iron, and temperature. S/D Engineers identified technologies and their costs to come into compliance with these standards and have presented these finding in a separate report.

This study utilized *EPA's Interim Economic Guidance for Water Quality Standards Handbook 2000* as the source of the methodology and the definition of terms with which to evaluate the financial and socioeconomic effects. This handbook contains an explicit methodology. It has its own definitions of terms like "cash flow" and "total debt" that are inconsistent with GAAP definitions. It also uses a simplified method for assessing the impact of the project on the profitability of a company, rather than preparing pro forma financial statements to measure the impact. The guidance also identifies the factors to consider in determining whether the socioeconomic impact of compliance would be widespread.

The handbook identifies **impact on profitability as the primary measure** of the impact of compliance. It prescribes use of profit before tax divided by sales as the indicator of impact. The handbook also **identifies three secondary measures of impact: liquidity, solvency, and leverage**. The measure of liquidity is the current ratio. The measure of solvency is the Beaver's ratio (defined by EPA to be net income plus depreciation ("cash flow") divided by total debt). The measure of leverage is the ratio of total long-term liabilities to shareholders' equity. EPA recommends that these measures be calculated for the previous three years both with and without the capital and operating costs of the project. The document prescribes that all four measures be considered in reaching a finding of substantial financial impact. EPA reviews the absolute level of the ratio and how the company's ratios compare to industry norms.

The methodology then identifies parameters to consider whether the impact on the community will be significant and widespread. EPA identifies several measures of community well being and the effect on the community of requiring compliance. These measures are:

(i) current unemployment rate compared to national unemployment rate and effect on community of additional unemployment created by installing pollution control equipment,
(ii) median household income of community and comparison to national median,
(iii) percent of households in community below the poverty line,
(iv) current expenditures on social services,
(v) additional spending related to job losses at the plant,
(vi) current tax revenues of the community and amount paid by WSC,

[1] Chapter 20, Articles 5 and 5A of the code of West Virginia and subsequent amendments and Section 7.52 Ohio River Basin – Tributaries.

(vii) statewide unemployment effect[2], and
(viii) statewide expenditures on social services.

FINDINGS

Financial Effects

As shown in Exhibit ES-1, the EPA-defined financial indicators are consistent with WSC's recent bankruptcy filing as they show:

- WSC had negative profits over the three year period 2000-2002
- WSC has negative owners' equity and thus its debt-to-equity ratio is either infinite or undefined
- WSC is strained to meet its short-term financial obligations

When compared to the EPA benchmarks, these financial indicators demonstrate that attaining compliance with the statewide criteria for lead, iron, and temperature would create unacceptable financial problems for the company.

When WSC's financial ratios are adjusted for the costs of meeting the criteria, the serious financial impact of this project becomes even clearer. Using the EPA methodology, losses increase. WSC becomes even more highly leveraged. The solvency situation deteriorates. The third column of Exhibit ES-1 shows the ratios after compliance costs.

EXHIBIT ES-1
FINANCIAL TEST RESULTS

Financial Test	Baseline 2000-2002	Adjusted for Compliance Costs	EPA Benchmark for Concern
Profit	- 19%	- 20%	Slightly Positive
Liquidity	0.83	.83	<2.0
Solvency	- 0.49	- 0.47	<0.15
Leverage[3]	- 2.19	-2.28	>6.05 (Comparables' Average)

Using these EPA-prescribed ratios, WSC also compares unfavorably to the rest of the industry as defined by a set of companies drawn from the description of its competition found in its most recent 10-K filing (see Exhibit ES-2). Its profits are well below the average of the rest of the industry – negative 19% versus negative 7%. Its operates with short term assets less than its short term liabilities (.83) whereas the average comparable competitor has $1.52 in current assets

[2] The unique geographic location of WSC Steel Corporation makes this measure less meaningful. The metro area spans two states and a third state is within ten miles of the community. Therefore, this analysis focuses primarily on the metropolitan area.

[3] When owner's equity is negative, the debt to equity ratio is negative. A negative ratio is worse than the highest positive value.

for each $1 of current liabilities. Its leverage is negative which means it has negative owner's equity and, effectively, has no financial value beyond its debts – its "leverage" is infinite. As predicted by the Beaver's ratio, WSC has joined many of its competitors in bankruptcy. Its negative 0.49 versus comparables average of negative 0.05 predicted this.

EXHIBIT ES-2
WSC COMPARED TO THE AVERAGE OF OTHER MAJOR US PRODUCERS

EPA TEST	WSC 2000-2002	Comparables	WSC Condition
Profit	- 19%	-7%	Worse
Liquidity	0.83	1.52	Worse
Solvency	- 0.49	- 0.05	Worse
Leverage	- 2.19	7.89	Worse

In addition to comparing unfavorably to comparables, it ranks near the bottom on all measures when compared explicitly to each comparable (see Exhibit ES-3). It even ranks below Bethlehem Steel which, until its assets were acquired by International Steel Group (ISG) on May 1, 2003, was in bankruptcy; and WPC who also is attempting to emerge from Chapter 11 bankruptcy at this time.

EXHIBIT ES-3
WSC COMPARABLES RANKED BY FOUR EPA-DEFINED FINANCIAL DIMENSIONS
(Relative Ranking: 1=Best, 9=Worst

	Profitability	Current Ratio	Beaver Ratio	Debt-Equity	Total
USX-US	2	1	1	1	5
AKS	3	2	2	2	9
Ispat	1	5	3	4	13
Rouge	4	6	6	3	19
National	5	4	5	8	22
Bethlehem	7	3	8	6	24
WPC	6	7	4	7	24
Weirton	8	8	7	5	28

Socioeconomic Effects

The socioeconomic effects of requiring this project are potentially significant. This project would move WSC even further "into the red." In addition the diversion of more than one year's normal capital spending could, at the margin, lead to further significant reductions in employment at WSC as a result of not being able to improve some other part of the mill. To

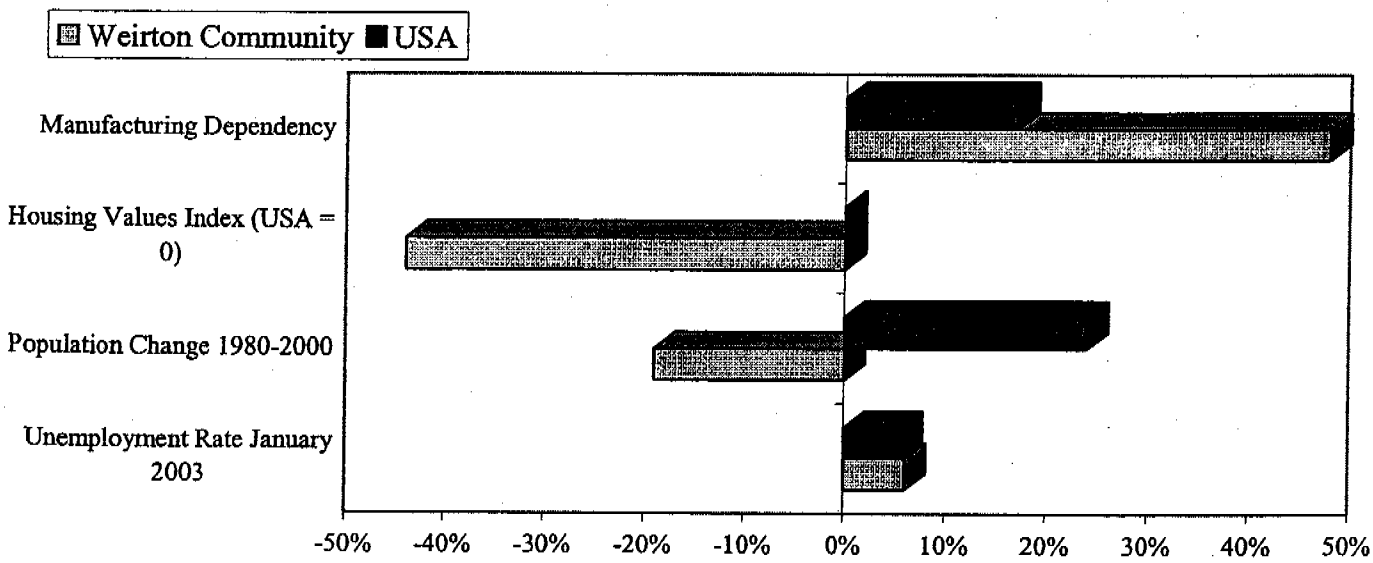
assess the socio-economic impact, this analysis evaluated the effect of the loss of 1,000 jobs (a conservative estimate).

In Weirton, West Virginia's case, the impact of a partial shutdown of operations would be widespread because:

- Weirton, West Virginia, located in the Steubenville-Weirton Metropolitan Area, suffers from significant economic difficulties:
    - Over 48% of the payrolls in the area are derived from manufacturing jobs, primarily in the steel manufacturing industry
    - The unemployment rate is 6.0%, which is above the nationwide average
    - Population has been declining over the past twenty-two years
    - Housing values are 44% below the national average
    - Per capita income is 22% below the national average.

Exhibit ES-4 shows how Weirton compares to the United States average along some key demographic and economic measures.

EXHIBIT ES-4
WEIRTON COMMUNITY COMPARED TO USA
(SELECTED INDICATORS)



- Losing 1,000 jobs at the mill (it currently employs about 3,500 persons) would result in:
    - The unemployment rate rising by at least 2% to nearly 8.0%
    - Lost earnings in the community of about $52 million per year

- A decline in state government revenue of at least $4.0 million from lost sales and income taxes
- Expenditures from the state unemployment trust fund of $9.1 million in the first year after job losses
- Further erosion of the housing stock as prices fell in response to decreased demand.

ASSUMPTIONS

An important financial analysis assumption involves the choice of comparables. Choosing comparables for WSC is problematical. WSC states in its 10-K that it competes with all integrated and mini-mills for sheet sales, and with certain other tin mill manufacturers for tin mill sales. Financial statements for the tin mills are generally unavailable because the mill is a component of a larger integrated manufacturer or is privately held. Information on large public steel companies, both integrated and mini-mills, are available. However, some of these firms are in bankruptcy and have either delayed publishing their 10-Ks for 2002 or have been acquired by others. For these reasons, this analysis uses all companies that WSC identifies as competitors and for which financial reports to the SEC are available, supplemented by major steel manufacturers whose sales volume is a) substantial and b) derived almost entirely from steel products.

The key assumption in the socioeconomic analysis is the choice of the Steubenville-Weirton metropolitan statistical area (MSA) as the community. WSC is located in Hancock County, West Virginia. The Steubenville-Weirton MSA includes Brooke County, West Virginia, Hancock County, West Virginia, and Jefferson County, Ohio. Socio-economic impacts analyzed here would generally be much greater if they were focused solely on Hancock County and the city of Weirton.

ORGANIZATION

The rest of this report is organized as follows:

- Chapter 1 -- Background -- a brief description of the WSC, the Weirton community, and the environmental problem and technological solutions and costs

- Chapter 2 -- Financial Effects -- an analysis of WSC's financial ability to meet the requirements for water pollution control

- Chapter 3 -- Socioeconomic Effects -- an analysis of the socioeconomic effects of complying with the current Harmon Creek requirements.

CHAPTER 1
BACKGROUND

1.1 Weirton Steel Corporation

Manufacture of steel began in Weirton, West Virginia, in 1909. In 1918 the Weirton Steel Company was formed. It combined with Great Lakes Steel Corporation and Hanna Iron Ore Company to form National Steel Corporation in 1929. From 1929 to 1939 the plant operated as a subsidiary of National Steel Corporation. From 1939 until the spin-off in January 1984, the plant was a division of National Steel Corporation. Since 1984 WSC has been an independent, employee-stock-owned steel manufacturing company.

In 1984 the employees of the Weirton facility became owner-employees by purchasing the facility for $300 million obtained as a loan from the National Steel Corporation. Today, 17% of the common stock and all of the Series A preferred stock, accounting for 36% of the voting power, is owned by two Employee Stock Ownership Trusts whose memberships includes retirees and approximately 3,500 current employees.

WSC is a single location, integrated steel manufacturer from blast furnace to finished mill product. The facility consists of two blast furnaces, a CAS-OB facility, two RH degassers, and two basic oxygen-process furnaces (BOPs) with a combined annual capacity of 3.0 million tons. Another significant facility is the four strand continuous caster with an annual capacity of 3.0 million tons. This caster allows WSC to continuously cast 100% of the raw steel it produces. Downstream facilities include hot strip, sheet, and tin mills with a downstream capacity of more than 3.2 million tons.

Overall WSC accounts for about 2.8% of the U.S. steel industry shipments. WSC sells tin mill and sheet products. In 2002, 54% of dollar sales were from sheet products and 46% from tin mill products. Measured in tons, 47% of shipments were to steel service centers and sheet and strip converters, 25% to container/packager manufacturers, 13% to pipe and tube sector, 9% to construction, and less than 6% to all other end uses.[4]

WSC competes in a geographically dispersed marketplace. Like other integrated steel producers, it faces major competition from domestic mini-mills and imports. According to the U.S. Geological Survey's 2001 Minerals Yearbook, mini-mills (which now compete in all end product categories) accounted for 47% of raw steel output.[5] Foreign competitors' imports, on a net basis, accounted for 26% of apparent steel consumption in 2001.[6] Historically, cost and quality advantages related to raw materials costs, age of manufacturing facilities, location of facilities, and low ocean-shipping rates are among several factors that have allowed steel imports to achieve a significant presence in U.S. markets.

To meet these competitive threats in this cyclical industry, WSC must constantly make capital improvements to maintain its productivity. These investments reduce costs, improve

[4] Source: 2002 10K for Weirton Steel Corporation.
[5] Source: 2001 Minerals Yearbook, "Iron and Steel" page 40.2.
[6] Source: 2001 Minerals Yearbook, "Iron and Steel" page 40.3.

quality, and provide production flexibility. According to WSC's filings with the Securities and Exchange Commission, WSC spent almost $20 million a year on capital projects between 2000 and 2002 to keep its manufacturing facilities competitive.

Financing for capital projects must come from either internally generated cash flow or outside financing. Prior to filing for Chapter 11 bankruptcy protection, WSC had limited access to outside financing:

- In September, 2001, it was de-listed by the New York Stock Exchange.
- In June 2002, it was able to exchange high interest rate debt obligations due in 2004 and 2005 (average rate above 11.5%) for a combination of 10% senior secured notes due in 2008 and 1.9 million shares of Series C Convertible Redeemable Preferred stock with a mandatory redemption in 2013. The effect of this transaction was not to attract additional capital, but rather to reduce the near-term cash obligations of the company to existing debt holders.
- In addition, WSC's debt is rated CCC by *Standard & Poor's*. A "CCC" rating is "currently vulnerable, and is dependent upon favorable business, financial, and economic conditions to meet its financial commitments."[7] This kind of rating results in very high interest charges. As a result, WSC depends on its internal cash flow to fund its capital spending needs.

Currently it is operating with Debtor-in-possession financing arrangement, and its debt has been further downgraded to "D" rating.

1.2 THE COMMUNITY

WSC is located in the city of Weirton, County of Hancock, in the northern panhandle of West Virginia on the Ohio River. This location places it within the Steubenville-Weirton metropolitan area as defined by the U.S. government. This metropolitan area includes the cities of Steubenville, Ohio and Weirton, West Virginia, and the Counties of Hancock and Brooke in West Virginia, and Jefferson County in Ohio. The area population is only about 132,000 -- split about 56% Ohio residents and 44% West Virginia residents. The nearest major metropolitan area is Pittsburgh, Pennsylvania, which is about 35 miles east.

1.2.1 The Community Today

Publicly available data provide the following demographic and economic profile of the area at the turn of the century.

- Population -- approximately 132,000 (2000)
- Housing -- ~59,000 units; 75% owner-occupied with a median value of $67,100 (2000).

[7] Source: Standard & Poor's website at http://www2.standardandpoors.com/

- Employment earnings – about 60% goods-related; 23% services and other; 11% government (2000)[8]
- Income measures: per capita income of $16,911 in 2000; household median income of $31,982; and median family income of $39,548
- Poverty – 10.4% of families, 33.1% of families without a husband present, and 13.5% of individuals lived below the poverty line.
- Educational attainment -- 69% high school graduates with no college degree, 12% college graduates, about 18% have not completed 12 years of education.
- Local Government Revenue Base – The most recent comprehensive data are from the USA County Data Book 2000, which provides information from 1996-97. General revenues for the three counties totaled $235 million in 1996-97. $75.6 million were property taxes. The rest were intergovernmental payments, other taxes, and fees.
- Federal Government Role -- In FY 2000 $792 million came into the community from the federal government.[9]

1.2.2 Community Compared to Nation

The Weirton community differs significantly from the nation as a whole. The U.S. overall is growing in population becoming more and more a service economy. Weirton is shrinking, is still heavily dependent on manufacturing jobs, and unemployment is more than the national average. This table and Exhibit 1-1 highlight how the Weirton Community differs for the worse from the nation as a whole. Specifically:

DEMOGRAPHIC CHARACTERISTIC	WEIRTON	USA
Population Change (1980-2000)	Down 19%	Up 24%
January 2003 Unemployment Rate	6.0%	5.7%
Percent of Payrolls from Manufacturing (2000)	48%	17%
Per Capita Income (1999)	$16,911	$21,587
Median Value of Owner-Occupied Housing (2000)	$67,100	$119,600

- Between 1980 and 2000 the population of the area declined from 163,734 to approximately 132,000. US population rose from 226.5 million persons to almost 281.4 million persons.[10]
- In the January 2003 the Weirton metro area had an unemployment rate of 6.0%. Overall, US unemployment was 5.7%.
- The manufacturing sector in 2000 accounted for 18% of non-farm earnings in Jefferson County, Ohio, 42% in Brooke County, West Virginia, and 61% in Hancock County, West Virginia.[11]

[8] Goods-related includes construction and retail and wholesale trades. Source: County Business Patterns 2000.
[9] Source: Consolidated Federal Funds Report (CFFR) Fiscal Year 2000 Total Direct Expenditures or Obligations found at http://www.census.gov/govs/cffr/01cffwv.htm. This includes direct payments to individuals like social security.
[10] Source: http://quickfacts.census.gov/qfd/states/00000.html

- In 2000, the US overall employed 16% of all workers in manufacturing, down from 22% in 1980. In these three counties 30% of private employment and about 24% of all employment was in manufacturing.
- In 2000 (the most recent year for which data is available) in the Weirton area, payrolls from manufacturing accounted for 48% of total payroll. In the US overall they accounted for 17%.
- Per capita income of $16,911 compared to a US average of $21,587 in 1999.
- Median value of owner-occupied housing $67,100 compared to a US average of $119,600 in 2000.

1.3 WATER POLLUTION ABATEMENT REQUIREMENTS AND PROPOSED SOLUTIONS

In the past 15 years, WSC expended more than $80 million to reduce the pollution from its wastewater streams. During this time, the treatment facility for the Harmon Creek discharge has been upgraded replacing two lagoons with a modern wastewater treatment facility equipped with screening, oil skimming, solids removal and pH adjustment. Nevertheless, to comply with West Virginia regulations regarding iron, lead, and temperature, WSC would have to make changes to its wastewater system at the Harmon Creek treatment system, at a capital cost of $36.0 million.

1.3.1 Harmon Creek Outfall Compliance Technology and Cost

Harmon Creek is classified as a tributary to the Ohio River and is subject to West Virginia statewide water quality standards promulgated in Chapter 20, Articles 5 and 5A of the Code of West Virginia and subsequent amendments. This discharge point is 2.2 miles upstream from the confluence of Harmon Creek and the Ohio River. At this point the Outfall makes up most of the flow into Harmon Creek which would result in water quality criteria for temperature, lead, and iron being imposed as effluent limitations.

S/D Engineers, Inc. evaluated, on the basis of feasibility and cost-effectiveness, all Harmon Creek treatment alternatives that could be employed to meet these limitations. S/D prepared a report describing the technical options for treatment and estimating the costs of these technologies. Exhibit 1-1 summarizes the findings of this report. Appendix A provides the detailed costs. As shown in the exhibit, the capital costs of this project are approximately $36.0 million.

EXHIBIT 1-1
COST ESTIMATE FOR C&E UPGRADES[12]

	Total Cost
Iron and Lead Removal	$16,200,000
Temperature Control	$19,800,000
TOTAL	**$36,000,000**

[11] Source: http://www.census.gov/epcd/ec97/metro8/M8080.html.
[12] Source: S/D Engineers study dated May 2, 2003.

CHAPTER 2

FINANCIAL EFFECTS

This chapter measures WSC's financial ability to meet water pollution control requirements at the Harmon Creek Outfall using the methodology and definitions of financial ratios provided by the USEPA in its *Interim Economic Guidance for Water Quality Standards*. According to the EPA guidance material, the results of these tests indicate the profitability impact of installing pollution control equipment and the consequent ability of WSC to meet its short and long-term financial obligations. Because several of the USEPA ratios rely on simplified computations of common measures of financial condition, some of these computations are not consistent with GAAP[13] or SEC requirements.[14]

Appendix B provides an explanation of the financial tests EPA prescribes (Section 2.1). In Section 2.1 these tests are applied to WSC without including the costs of the project to create a "baseline condition." The incremental financial effects of the project are assessed against this baseline. Section 2.2 presents the financial test results after incorporating the project costs. Finally, Section 2.3 summarizes the findings of this chapter.

2.1 BASELINE

This section evaluates the present financial condition of WSC before compliance. The data needed to perform these tests were obtained from the following sources:

Individual company financial information

- Weirton Steel Corporation 10-K reports 2000-2002.
- 10-K financial data for 2000-2002 as reported by Multex Investor Services, available from the Wall Street Journal On-line, for *United States Steel, Bethlehem Steel Corporation, AK Steel Holdings, Ispat International (old Inland Steel), and Rouge Steel*
- *SEC filings of National Steel and WHX Corporation that became available after May 2, 2003 (and that, given Weirton's bankruptcy, became legitimate comparables).*

Steel industry economic and financial conditions and choice of comparables

- WSC 10-K and proxy statement for 2002
- Press releases from the American Iron and Steel Institute, the Department of Interior,

[13] GAAP -- Generally Accepted Accounting Principles

[14] Additionally, the necessity to simplify can occasionally result in misleading computations. For example, as explained in the text below, the EPA guidance states that the Beaver's ratio is a "good predictor of bankruptcy." The Beaver's ratio, as defined by EPA, is average annual cash flow (defined as net income plus depreciation) over the prior three years divided by total debt. The denominator in this case gives no consideration to when the debt is due. Obviously, a company with most of its debt coming due in two to three years is in a very different position than a company with its debt coming due in ten or twenty years. Yet the EPA Beaver's ratio does not account for this critical timing factor.

the Department of Commerce, and a variety of trade publications

- Wall Street Journal Databank
- Standard and Poor's Industry Surveys

Costs of water pollution control technologies

- WSC environmental control department provided estimates prepared by S/D Engineers in April 2003 in a report dated May 2, 2003.

Appendix C provides the detailed data used to compute the ratios for WSC and for the comparable company composite.

2.1.1 Choice of Comparable Companies

WSC identifies its competitors in sheet production as "most domestic and international integrated steel producers and mini-mills."[15] It identifies its tin mill competitors as US Steel, ISG, National, and Ohio Coatings (partially owned by Wheeling Pittsburgh Corp.). A set of the major integrated steel producers and those tin mill competitors for whom financials were available was chosen as the comparables for this analysis. To use other lists, like S&P's industry list, would result in a comparison of WSC to numerous more profitable mini-mill companies thus making WSC look even worse by comparison. The companies chosen to compare to WSC were U.S. Steel, Bethlehem Steel (part of ISG as of May 1, 2003), AK Steel Holdings, Ispat International, Rouge Steel, National (assets acquired by US Steel on May 20, 2003), and Wheeling-Pittsburgh (WPC).

2.1.2 Baseline Results

Exhibit 2-1 presents the key measures for WSC for 2000-2002, and 2002 alone, before making any adjustments for the costs of the various water pollution control options. These ratios, therefore, serve as the baseline against which the incremental effects of the pollution control options are assessed. Exhibit 2-1 also shows EPA's benchmarks for interpreting the test results. These benchmarks apply to the ratios after adjustment for the costs of pollution control. Exhibit 2-1 shows that, before considering the pollution control costs, WSC is unprofitable, its liquidity very weak, its ability to meet its long-term financial obligations speculative, and its leveraged condition negative.

[15] Source: Weirton Steel Corporation 10-K for 2002, Competition and Imports section.

EXHIBIT 2-1
WSC FINANCIAL INDICATORS BEFORE
CONSIDERING THE COSTS OF COMPLIANCE AT HARMON CREEK

EPA TEST	WSC 2000-2002	WSC 2002	EPA Benchmark
Profit	- 19%	- 12%	Slightly Positive
Liquidity	0.83	0.71	<2.0
Solvency	-0.49	-0.13	<.15
Leverage	-2.19	-1.44	6.05 -- Industry Average

Source: See Appendix C for data underlying ratios.
See the EPA Guidance Manual for a discussion of benchmarks.

The EPA guidance also prescribes comparing the ratios – profit, liquidity, solvency, and leverage– with ratios for companies in the same industry. Exhibit 2-2, based on data extracted from individual company 10-K's and aggregated to create this benchmark, shows that WSC is less liquid, much less profitable, less likely to be able to meet its long-term financial obligations, and, much more highly leveraged than the average of the other firms contained in this benchmark group.

EXHIBIT 2-2
WSC COMPARED TO
OTHER MAJOR INTEGRATED STEEL PRODUCERS
(2000 to 2002 Average)

EPA TEST	WSC 2000-2002	Comparable Companies	WSC Condition
Profit	-19%	-7%	Worse
Liquidity	0.83	1.52	Worse
Solvency	-0.49	-0.05	Worse
Leverage	-2.19	7.89	Worse

Exhibit 2-3 provides an overall ranking for each of the comparable steel producers. WSC is the next-to-highest leveraged, the least profitable, has a Beaver's ratio worse than all except bankrupt Bethlehem, and is the least liquid. Appendix C provides the data and calculated ratios behind this exhibit.

EXHIBIT 2-3
WSC FINANCIAL CONDITION RANK
(AVERAGE 2000 -- 2002)
(1=Best, 9=Worst)

	Profitability	Current Ratio	Beaver Ratio	Debt-Equity	Total
USX-US	2	1	1	1	5
AKS	3	2	2	2	9
Ispat	1	5	3	4	13
Rouge	4	6	6	3	19
National	5	4	5	8	22
Bethlehem	7	3	8	6	24
WPC	6	7	4	7	24
Weirton	8	8	7	5	28

In summary, even before adjusting the financial ratios for the costs of water pollution control, WSC is financially weaker than its competitors. Relative to these competitors, WSC falls near the bottom on all four measures.

In the next section, WSC's financial data are adjusted for the costs of the project. These adjustments reveal the significant impact this project could have on the financial condition of WSC.

2.2 IMPACT OF COMPLIANCE AT HARMON CREEK OUTFALL

This section adjusts the baseline financial ratios for the costs of bringing the Harmon Creek Outfall into compliance with the water quality standards. It begins by computing the "annualized project costs" per the EPA guidance.[16] By subtracting these annualized costs from WSC's reported profit before tax, EPA determines whether the project creates significant financial hardship.

2.2.1 Calculation of Annual Cost of Pollution Control Project

The elements needed to compute the "annualized project costs" are (1) the capital cost of the project; (2) the interest rate for financing the project; (3) the time period over which the project will be financed; and (4) the annual costs of operation and maintenance of the project. The interest rate and time period are combined to obtain an "annualization factor." The annual capital cost is the capital cost times the annualization factor. The annual capital cost plus the annual operating and maintenance costs are the annual costs of the project. For this project these parameters are:

- Capital cost -- $36.0 million. S/D Engineers estimated these costs which are provided in a separate report. The cost details can be found in Appendix A to this report.

[16] See Worksheet G in Chapter 3 of *Interim Economic Guidance for Water Quality Standards Handbook*, February 2000 update of March 1995 Handbook.

- Interest rate – 10%. In 2002 WSC knew it faced a cash crunch when certain loans came due in 2004 and 2005. To address this, in June 2002 WSC was able to *exchange* its senior notes coming due in 2004 and 2005 for notes due in 2008 along with convertible redeemable preferred stock with a mandatory redemption at $48.4 million in 2013. The City of Weirton on behalf of the company was able to *exchange* the 8.625% pollution control bonds due in 2014 for 9.0% bonds due in 2012. Financing the requirements of this project would be extremely difficult (and likely impossible) as recognized by WSC having to: raise the interest rate on its pollution control bonds (and shorten their duration), offer convertible redeemable preferred stock with mandatory redemption to get its creditors to agree to lower its interest payments from 11.05% to 10%. Using 10% (the rate on the six year duration notes) is a lower bound estimate of WSC's cost to finance this project.

- Time horizon – 10 years. EPA prescribes using a 10-year time horizon for the financing. WSC new financing is due in 2008: only a six year duration. Use of 10 years rather than 6 years understates the impact of this project on profitability.

- Operating and maintenance costs -- $7.025 million annually. S/D Engineers, Inc. provided estimates that are detailed in Appendix A.

This interest rate and the time period yield an annualization factor of .16275. The $36.0 million capital cost multiplied by the annualization factor results in an annualized capital cost of $5.86 million a year.

Finally, the "Total Annual Cost of Pollution Control Project" is the annualized capital cost plus the annual operating and maintenance costs. For this project it is $12.89 million per year ($5.86 plus $7.03). Exhibit 2-4 summarizes how the annual costs of the project are computed.

EXHIBIT 2-4
TOTAL ANNUAL COST OF HARMON CREEK OUTFALL COMPLIANCE

Project Capital Cost	X	Annualization Factor	=	Annual Project Capital Cost
$36.0 million	X	.16275	=	$5.86 million

Annual Project Capital Cost	+	Annual Operating & Maintenance Costs	=	**Total Annual Cost**
$5.86 million	+	$7.03 million	=	**$12.89 million**

2.2.2 Impact of Annualized Pollution Control Costs on WSC Financial Ratios

This annualized cost is then subtracted from the profits of WSC to assess the potential impact on WSC of requiring this project. Using EPA's method, earnings before tax go from an average loss of $198 million to a negative $212 million. Depreciation would rise by about $3.6

million – assuming that EPA's ten-year life estimate is also allowable for accounting purposes. If outside funding for this project were available, which is highly doubtful, it would come in the form of debt or even more costly redeemable convertible preferred stock. Effectively, WSC's debt would rise by $36.0 million.

EXHIBIT 2-5
FINANCIAL TEST RESULTS ADJUSTED FOR COSTS
OF ACHIEVING THE STANDARDS AT THE HARMON CREEK OUTFALL

Financial Test	**Baseline Adjusted for 2000-2002 Compliance**	**EPA Benchmark**
Profit-- Profitability	-20%	Slightly Positive
Liquidity – Current Ratio	0.83	<2.0
Solvency -- Beaver's Ratio	-.47	<.15[17]
Leverage -- Ratio of Total Liabilities	-2.28	>6.05 (Comparables Average)

Each of the ratios deteriorates from baseline conditions. Exhibit 2-5 presents the four financial tests adjusted for the costs of complying with the standards. The exhibit shows:

- Profitability (as defined by EPA) drops one percent due to the imposition of $12.89 million a year of additional costs;
- WSC is worse than the EPA benchmarks for all tests;
- Solvency measure (Beaver's Ratio) after compliance predicts potential long-term problems should profitability not return; and
- The additional debt incurred increases WSC's leveraged condition. This will result in more cash needed to make interest payments and repay debt, thereby diverting funds from other capital projects.

2.3 SUMMARY OF TEST RESULTS

Before adjusting the financial ratios for the costs associated with compliance, WSC is weak on all measures compared to comparable steel companies, and below EPA benchmarks. These test results indicate that requiring compliance would have a significant financial effect on WSC.

After adjustment for the costs of compliance, the financial ratios deteriorate further. WSC's negative profitability, its negative owners' equity (reflected in its negative leverage ratio), and its Beaver ratio well below values that suggest financial distress, all point to problems for WSC should this project proceed. Furthermore, these financials suggest that securing financing for this project would be problematical.

[17] As explained in Appendix B, a ratio below .15 suggests potential for serious financial problems and a ratio above .20 indicate no problems. When the indicator is between .15 and .20 the indicator is not a good predictor.

CHAPTER 3
SOCIOECONOMIC IMPACT

This chapter presents the socioeconomic impact consequent to diverting this large sum of capital to this water pollution control project. After introducing the reasons why this project could lead to significant and widespread impact, the EPA methodology is presented in section 3.2. The community is defined in section 3.3. Section 3.4 provides the impact on employment in the area and the specific impact on affected individuals who lose their jobs. Section 3.5 presents the impacts on the rest of the Weirton economy, state and local government, housing values, and incomes. Section 3.6 summarizes the findings of this chapter.

3.1 POLLUTION CONTROL SPENDING LEADS TO FEWER STEEL-MAKING JOBS

As made clear in the previous two chapters, spending $36.0 million on the Harmon Creek treatment plant creates significant financial impact. The consequences of this financial impact can be significant. Given WSC's financial condition, the long-run effect is to hinder WSC's ability to compete. At a minimum, the diversion of funds away from productive investment will cause some part of the plant to become less productive. Eventually products dependent on this part of the facility will not be produced at a profit. Then shutdown of parts of the mill will commence and jobs will be lost. If WSC management chooses correctly and diverts funds from an area that is less critical to WSC's well being, then the number of jobs lost will be minimal. If the choice is wrong, the impact could be great. In the extreme, the plant would shutdown.

3.2 MEASURES OF COMMUNITY IMPACT

To assess the socioeconomic impact of reductions in employment at WSC, EPA prescribes[18] examination of several parameters that provide an understanding of the potential for widespread impact. These measures are:

- Current unemployment rate compared to national unemployment rate and effect on community of additional unemployment created by installing pollution control equipment
- Median household income of community and comparison to national median
- Percent of households in community below the poverty line
- Current expenditures on social services
- Additional spending related to job losses at the plant
- Current tax revenues of the community and amount paid by WSC
- Statewide unemployment effect[19]
- Statewide expenditures on social services[20]

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[18] *Economic Guidance for Water Quality Standards Handbook,* February 1997 update to March 1995, Section 3-3.
[19] The unique geographic location of WSC makes this measure less meaningful. The metro area spans two states, and a third state is within ten miles of the community. Therefore, this analysis focuses primarily on the metropolitan area.
[20] See previous footnote.

No specific measures of impact (e.g., if unemployment rises by 2%, or if tax revenues decline by 10%) are provided in the EPA guidance.

3.3 DEFINITION OF RELEVANT GEOGRAPHIC AREA

EPA Guidance[21] recommends that the "affected community is most often the immediate municipality." In this case the immediate municipality is Weirton, West Virginia in Hancock County. This municipality is located in the northern panhandle of West Virginia on the Ohio River. Wastewater from WSC flows a short distance in Harmon Creek before entering the Ohio River just upstream of Steubenville, Ohio. Steubenville, Ohio, and Weirton, West Virginia are linked in an economic sense as well. This is reason the U.S. Bureau of the Census considers the Steubenville-Weirton area to be a "metropolitan area." This metropolitan area includes the cities of Steubenville, Ohio and Weirton, West Virginia, in the counties of Hancock and Brooke in West Virginia, and Jefferson County in Ohio. The nearest major metropolitan area is Pittsburgh, Pennsylvania, which is about 35 miles east of the city of Weirton. This metropolitan area is the geographic area analyzed here.[22]

3.4 IMPACT ON EMPLOYMENT IN THE COMMUNITY

The unemployment rate in the Steubenville-Weirton metro area was 6.0% in January 2003. This unemployment rate is 5% higher than the nationwide average that month – 5.7%.[23]

EXHIBIT 3-1
PRIVATE EMPLOYMENT IN THE STEUBENVILLE-WEIRTON METRO AREA – 2001

Business Employment 2001	COUNTY			
	Hancock WV	**Brooke, WV**	**Jefferson, OH**	**Total**
Agriculture (e)	20	20	68	108
Construction	178	253	785	1,216
Manufacturing	7,354	1,469	4,609	13,432
Wholesale Trade	125	143	819	1,087
Retail Trade	1,375	566	3,559	5,500
Transportation, warehousing, and utilities	251	245	1,207	1,703
Information	25	7	397	429
Finance, Insurance, real estate, and rental and leasing	441	169	1,005	1,615
Professional, scientific, mgt., administrative, and waste mgt. (e)	501	214	1,479	2,194
Educational, health, and social services (e)	1,114	2,813	5,410	9,337
Arts, entertainment, recreation, accomodations and food services (e)	1,996	700	2,044	4,740
Other services	469	388	1,430	2,287
Total	13,849	6,987	22,812	43,648

Source: http://censtats.census.gov/cgi-bin/cbpnaic/cbpsect.pl at 4/17/03

As shown in Exhibit 3-1, non-government employment in the three county metro area totaled 43,648 in 2001. WSC's approximately 3,500 employees at year-end 2002 account for

[21] *Economic Guidance for Water Quality Standards*, February 1997. See page 4-1.

[22] It is important to recognize that this choice of geographic area understates the effect on Hancock County and the city of Weirton. Both of these communities are even more dependent on WSC than the metropolitan area.

[23] Source: http://www.bls.gov/eag/eag.oh_steubenville.htm at 4/15/03 and http://data.bls.gov/servlet/SurveyOutputServlet?data_tool=latest_numbers&series_id=LNS14000000.

about 8.0% of all private employment in the Steubenville-Weirton metro area and 26% of the private workforce in Hancock County. When a single manufacturing facility accounts for this much of the private employment in the community, the community is vulnerable to the fate of the facility.

The impact of total plant closure would obviously lead to a significant decline in economic activity in Weirton, West Virginia, accelerated loss of population, further depression of housing values, and increased government social spending. For the city of Weirton, West Virginia the impact would clearly be widespread. For the entire Steubenville-Weirton metropolitan area, the effect would also be severe. As discussed above, many companies that enter Chapter 11 bankruptcy emerge as smaller entities employing fewer persons. As a smaller entity WSC would be even less able to afford the pollution control costs associated with this regulation. To illustrate the impact of job losses on the area, the rest of this analysis examines the effects on a number of socioeconomic indicators occasioned by the loss of 1,000 jobs at the WSC.

3.4.1 Effect on Weirton Community of the Loss of 1000 Jobs at WSC

Loss of 1000 jobs at WSC would impact all areas identified in the EPA guidance. The community unemployment rate in January 2003 was 6.0% with 3,253 persons seeking work out of a total (private and public) labor force of 53,771. 1,000 lost jobs would cause the number of unemployed to rise to 4,253, raising the unemployment rate to almost 8.0%, an increase of 2%.

The laid-off workers will suffer losses in income. The other sectors of the Weirton economy will lose sales. Housing values will drop. The state and local governments will lose tax revenues but incur increased social spending. This rest of this chapter explains the specific magnitude of these effects.

3.4.1.1 Losses to Employees

Laid-off employees of WSC suffer two kinds of losses – monetary and non-monetary (psychic) costs. Non-monetary costs are not addressed in this analysis. Monetary losses are those earnings and fringe benefit losses during the initial period of unemployment plus the loss in earnings and fringe benefits after reemployment. This latter component is known as the loss in human capital.

Reemployment in Weirton, West Virginia, where available, would be at reduced wages. The difference between what the laid-off employee earns in subsequent jobs and what they were earning at WSC should decrease with each succeeding year as they acquire alternative skills.

The measure of the loss to employees is the difference between what the employee earned at WSC and what he/she earns after being laid off.

Although not usually included in employees' income, fringe benefits such as medical and dental coverage, life insurance, and pension benefits are significant losses when employees are

laid off permanently. At WSC, fringe benefits excluding social security, Medicare, and workers compensation tax contributions account for about 28 percent of labor cost.[24] The loss of fringe benefits to WSC employees is the difference between the amount plant employees would have contributed to such benefits while employed ($0) and the amount insurance companies would charge individuals for similar coverage. Obtaining actual charges of companies for these benefits was not possible. However, a reasonable estimate of these losses to the employees is the average cost to WSC of these benefits or 28 percent of employment costs.

3.4.1.2 Earnings Loss During Initial Period of Unemployment

From the time employees lose their jobs until they are re-employed, they suffer a loss in disposable income. This loss consists of wages (net of taxes) over the period of unemployment minus transfer benefits received. Transfer benefits include unemployment compensation (from the government) and supplemental unemployment benefits (SUB) from a fund maintained by the company per its labor agreements.

Lost gross wages consist of the wages employees would have continued to receive over the period of unemployment if they had not been laid off. Exhibit 3-2 shows average wages and average take-home pay for WSC hourly employees in 2002.

The lost spending power of the workers, however, is the difference between the take-home pay while employed at WSC and the combined unemployment and SUB benefit. The unemployment benefit from the state fund payment is capped at $351 per week. Laid-off WSC employees will almost certainly qualify for $351 per week.[25]

EXHIBIT 3-2
WSC WAGE EMPLOYEES ESTIMATED WEEKLY EARNINGS (2002)

Gross Wage or Salary	$960[26]
Less Federal Income Tax	$75
Less State Income Tax	$33
Less SSI and Medicare Tax	$73
Net Take-home	$779

Note: Union dues and any other items other than taxes withheld from pay are not considered here.

WSC's supplemental unemployment benefit plan provides that the combination of state unemployment benefits plus SUB benefits will total 31 times the employee's average straight - time hourly earnings each week for as long as the employee is entitled to benefits. Straight time

[24] Source: Derived from Working Force Report for December 2002 provided by, Weirton Steel Corporation, April 23, 2003.

[25] Employees who earn $33,250 or more in the 12 months before unemployment qualify for the maximum benefit according to the West Virginia Bureau of Employment Programs at Internet site http://www.state.wv.us/bep/uc/Ucrates/default.htm accessed on 4/18/2003.

[26] Source: Derived from Working Force Report for December 2002 provided by Weirton Steel Corporation, April 23, 2003. Wage employees' payroll per hour ($24.01) times forty hours. This rate includes overtime differentials, holiday pay, vacation pay, and incentive compensation. It excludes benefits like pensions and insurance.

hourly earnings were $19.995 in 2002.[27] Thus, the weekly total benefit would be $620. Because the state would pay $351, this leaves WSC's SUB plan to pick up the remaining $269. However, SUB is capped at $200 per week, and could be less if the fund runs low.[28] Thus the maximum total is $551. The duration of benefits is a function of tenure with most employees qualifying for benefits up to 26 weeks (and some up to 104 weeks).

Employee losses over the immediate period of unemployment depend on the duration of unemployment as well as on the reduction in disposable income. The duration of unemployment is a function of both the demographic characteristics of the plant employees and regional factors characterizing the Weirton community.

EXHIBIT 3-3
LAID-OFF EMPLOYEES' DISPOSABLE INCOME DROPS
DURING PERIOD OF UNEMPLOYMENT

Total weekly after tax wages while employed		$779
Unemployment benefits	$351	
SUB payments[29]	$200	
Approximate Tax on UB and SUB	($55)	
Total weekly after tax benefits when unemployed		$496
Weekly net disposable income loss		$283

Given that the steel-making skills acquired at WSC will not be of use in other occupations, it is likely that the employee will not command the same compensation in his new employment. Furthermore, it is also unlikely that the employee would find work in other manufacturing employment if he were among 1,000 persons in the area without work. Thus the laid-off WSC employee would likely remain on unemployment until the benefits run out -- at least 26 weeks. At that time he would take a job in a non-manufacturing occupation or drop out of the force (e.g., retire). Assuming the employee remained without employment for 26 weeks, the loss to each employee during the initial period of unemployment is $283 times 26 weeks or $7,358 in disposable income.

As described above, the person seeking employment in the Steubenville-Weirton Metro

[27] Ibid. Straight time earnings for wage employees were $19.995 in 2002. Straight time earnings include base, incentive, shift differential, and Sunday premium components.

[28] According to WSC staff (Mr. Peter Rich), "the weekly SUB benefit payable when the financial status of the Plan exceeds 35% is essentially equal to 31 times the employee's average straight time hourly earnings minus state unemployment up to a maximum of $200. The benefit is reduced to 60% when the Plan's financial status is 25% or more but less than 35%, and reduced to 35% when the financial status is 15% or more but less than 25%. The length of time an employee may receive weekly benefits is determined by the number of credit units earned while working subject to a maximum [26 for employees with 2 to 10 years of service; 52 for employees between 10 and 20 years service; 104 for employees over 20 years service]. One credit unit is cancelled for each weekly benefit paid.

[29] SUB payments are capped at $200 per week. 31 times straight-time pay less $351 in unemployment benefits is more than $200.

area will find a job at a lower rate of pay. The loss associated with lower-paying employment is the loss in human capital.

3.4.1.3 Loss in Human Capital

Laid-off employees are almost certain to suffer a loss in human capital upon reemployment. Two factors cause this phenomenon: low transferability of skills from steel production to other occupations and loss of union rents. Because organized employees have more bargaining power than individuals; unions frequently are able to negotiate wages greater than those that would be seen as competitive by management. The difference between these wages and competitive wages is "union rent." Whether due to low transferability of skills or due to union rent, the loss in human capital faced by laid-off WSC employees in Weirton is significant.

Unable to use their developed skills, workers would likely be re-employed at the average wage of the non-manufacturing jobs in the metropolitan area. This is about $397 per week as shown in Exhibit 3-4.

EXHIBIT 3-4
ESTIMATED WEEKLY PAY FOR NON-MANUFACTURING PRIVATE EMPLOYEES IN THE STEUBENVILLE-WEIRTON METRO AREA

2000 private payroll inflated to 2002[30]	= $1,228,752,000	
Manufacturing earnings inflated to 2002	= $592,940,000	
Estimated non-manufacturing payroll in 2002	= $635,812,000	
2000 private employment in area[31]	= 44,024	
2000 manufacturing Employment[32]	= 13,263	
Non-manufacturing employment	= 30,761	
Non-manufacturing average annual pay	= $635,812,000 / 30,761	= $20,669
Non-manufacturing average weekly pay	= $20,669 / 52 weeks	= $397

Thus, as shown in Exhibit 3-5, after reemployment the employee would suffer a loss in gross wages of about $563 per week, and a loss in disposable income of about $367 per week.

For the first year after being laid off, the employee would **lose** disposable income of $7,358 while unemployed and $9,542 after re-employment, for a total $16,900. In subsequent

[30] Source: three county totals from 2000 Regional Economic Information available at http://govinfo.library.orst.edu/cgi=bin/reis-list. Payrolls increased by the ratio of the Dec 2002 to Dec 2000 nationwide employment cost index (6.5%) to estimate 2002 payrolls.
[31] These data are taken from the metropolitan statistical area data available from the U.S. Census Bureau's NAICS system. (http://censtats.census.gov/cgi-bin/msanaic/msasect.pl). They come from the same source as the payroll data. They differ slightly from the totals shown in Exhibit 3-1 because Exhibit 3-1 is for 2001, not 2000.
[32] Ibid.

years the annual loss would be $19,084.

EXHIBIT 3-5
LOSS IN WAGES AND DISPOSABLE INCOME AFTER RE-EMPLOYMENT

		GROSS WAGES	DISPOSABLE INCOME
Weekly wages at WSC	=	$960	$779
Gross weekly wages – non-manufacturing	=	$397	$412
Difference	=	$563	$367

Source: Exhibits 3-2 and 3-4 for Gross Wages. Disposable Income includes effect of the earned income tax credit.
Note: Disposable income estimated for a family of four taking a standard deduction, applying 2002 tax rates, and accounting for the earned income tax credit.

3.5 OTHER SOCIOECONOMIC IMPACTS ON WEIRTON COMMUNITY

As the largest employer in Hancock County, WSC has a major impact on the overall economy of the area. Almost all other employment derives from (a) suppliers to or customers of the major businesses in the metro area, and (b) retail and services employment derived from the spending by the employees.

To measure the impact on the Steubenville-Weirton community of the loss of 1,000 jobs at the WSC plant, direct-effect multipliers based on 1997 data from the Department of Commerce. According to the RIMS II model used by the US government, the direct-effect and final-demand multipliers for facilities like WSC in the Steubenville-Weirton MSA are:

- Earnings -- 1.7942
- Employment -- 2.8683
- Final-demand -- 1.6459. [33]

The earnings multiplier means that for each dollar of lost employee earnings at the steel mill, the metro area loses $1.7942 in earnings. For each job lost at WSC another 1.8683 jobs are lost. For each dollar of sales lost, the community loses and additional 64 cents. According to the RIMS II documentation, earnings are wages and salaries plus health insurance costs less "personal contributions for social insurance."[34]

[33] Source: RIMS II Multipliers for the Steubenville-Weirton, OH MSA, Industry 37.0101 Blast furnaces and steel mills. Subsequent to May 2003 updated multipliers became available to this analyst. While these multipliers differ slightly from those used then (2.58 for employment, 1.58 for final demand output, and 1.8008 for earnings), given the uncertainty in these estimates, the calculations have not been updated.
[34] Earnings also include directors' fees and proprietors' income which are not germane to this analysis.

Weekly lost wages at WSC would be the $960 earned while at WSC less the 397 earned from subsequent non-manufacturing employment. (See Exhibit 3-5.) This amount ($563) should be adjusted downward to account for employees' share of social insurance (7.65% of total wages at this income level).

While good measures of the wages paid in alternative occupations are available, no information exists to determine the extent of health insurance costs in various occupations. Because many persons either can not obtain, or can not afford, health insurance today, it is likely that post-WSC employment opportunities would have lower health insurance costs (with concomitant lesser coverage). This analysis ignores the change in health insurance costs which causes this estimate of economic impact to be understated.

The lost earnings per employee after reemployment are $563 per week, or $29,276 per year. The earnings multiplier (1.79) raises the effect on the community to $52,404 per lost job. Thus the loss of 1,000 jobs at WSC could result in the community losing around $52 million dollars of earnings.

The employment multiplier means that for each job lost at the mill, the metro area loses 2.8683 jobs. 1,000 jobs lost at WSC translate into 2,868 fewer jobs in the metro area.

For each dollar of sales lost by WSC, other businesses in the metro area lose 64.59 cents. These declining sales are already impacting the tax base of the community, leading to a budget crisis in the City of Weirton.[35]

These US government-provided multipliers demonstrate the critical role the steel mill plays in this metro area. For example, census data show that the dramatic decline in population[36] in the Weirton community over the past 18 years, as the steel industry shrank, reflects out-migration, rather than an imbalance in deaths and births.

Household Income. The loss of 1,000 jobs at WSC would reduce total wages and salaries in the Weirton community by about 4.7% (2.6% directly and another 2.1% through the effect on other parts of the local economy) – assuming they could find jobs in alternative occupations. Wages and salaries account for 56% of total household income in the Steubenville-Weirton MSA.[37] Because household income is not limited to wages and salaries (it includes retirement pay, social security, interest, government transfers, etc.), the overall impact would be less.

In 1999 Weirton community median household income was 25% below the national average ($31,982 compared to a national average of $41,994) and in 1999 per capita income was

[35] Facing a multi-million dollar shortfall, the City of Weirton recently proposed to impose a B&O tax. The shortfall derives from the decreasing tax base of the community. The B&O tax has been vigorously debated in the local papers.

[36] Source: Census of Population, US Bureau of the Census.

[37] Source: U.S. Department of Commerce, BEARFACTS website at http://www.bea.gov/bea/regional/bearfacts/bf1/msa/b178080.htm accessed on April 22, 2003.

22% below the national average ($16,911 versus $21,587). The loss of WSC high-paying jobs would accentuate this difference.

Government Revenue -- Income Tax. The marginal income tax rate in both West Virginia and Ohio is about 4.5% for incomes between $20,669 (post-WSC employment wages from Exhibit 3-4) and $49,940 (WSC wages from Exhibit 3-2). Thus, the annual lost state tax income tax revenue would be approximately $1,317 per job ($29,276*.045) or almost $1,317,000 if 1,000 jobs were lost. Including others who would lose earnings (the multiplier effect) raises this total to $2,358,000. There is no local income tax in Weirton.

Government Revenue -- Sales Tax. In addition the state would lose sales taxes as these employees and others made fewer purchases. The sales tax rate in West Virginia is 6% on all items. In Ohio it is 5%, though up to 2% can be added on in certain locations. Jefferson County imposes an additional 0.9% to fund road construction and maintenance.[38] Sales tax revenue is lost on the portion of the earnings differential that would be spent by the employee. The disposable income difference is about $19,084 per job (annual disposable income of $40,508 ($779*52) at WSC and $21,424 ($412*52) upon reemployment). Including the earnings direct-effect multiplier results in at least $34,160 in sales per job lost. Should 1,000 WSC employees lose their jobs, the annual lost sales could be $34.2 million and the states could lose as much as $2.05 million in sales tax.

Government Revenue -- Property taxes. Additionally, the shutdown of facilities could reduce property taxes paid by WSC Steel Corporation. In 2002 WSC paid $6,835,081 in property taxes to Brooke and Hancock Counties.[39] This is at least 20% of the total personal and real property taxes received by these counties.[40] In addition WSC makes payments in lieu of utility, excise, and real estate taxes to the City of Weirton that totaled $3.5M in 2002.[41] These amounts are more than 1/3 of the city's annual budget.

Housing Prices. Census data reports that the median value of owner-occupied housing in Weirton was $67,100 in 2000. This compares to a national median of $119,600. Clearly, the housing stock of Weirton reflects its age, location, and the poor economic climate in the area. In addition, the loss of 1,000 jobs would result in (a) reemployment in the area at lower incomes and (b) some net out-migration from the area. Both these consequences would result in a further decline in Weirton housing values relative to national averages.

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[38] Source: http://its.berkeley.edu/publications/localoptiontax/ohio. pdf/ on 4/22/03.

[39] Source: Spreadsheet provided by M. Camerson, WSC, April 21, 2003.

[40] Brooke County collected $12 million and Hancock County $18.7 million in property taxes in 1996-97 according to USA Counties 2000 provided by the Bureau of Census at http://tier2.census.gov/cgi-win/usac/table.exe accessed on 4/21/03. Changes in the way property revenue are reported by the US government do not allow for exact updates of this information. The Bureau of Census estimated tax revenue for the two counties in 1997 (excluding education related property taxes) at $7.1 million. (Source: Table 13 from Finances of County Governments 1997, published in August 2000, by the US Census Bureau found at http://www.census.gov/prod/gc97/gc974-3.pdf. on 4/24/03). The Board of Education in Hancock and Brooke Counties estimated their revenue from local sources to be $24.1 million in 2001-2002. (Source: http://wyde.state.wy.us/finance/data/2002/pdfs/ on 4/24/03.)

[41] Source: Spreadsheet provided by M. Camerson, WSC, April 21, 2003.

Government Spending – Unemployment Insurance Trust. The typical laid-off worker can expect to be on unemployment for twenty-six weeks. The state can expect to spend $351 on unemployment compensation each week. For 1,000 employees this totals $9,126,000 ($351 per week X 26 weeks X 1,000 employees).

Poverty. Because both the unemployment compensation and the re-employment opportunity (on average) are above the poverty line, there will be on average no impact on the numbers of persons in poverty in the area. In 2000, 13.5% of individuals[42] in the Steubenville-Weirton metro area were living below the poverty line. This level is comparable to the nationwide average (12.4%).[43]

When the distribution of laid-off employees is considered, there might be a slight increase occasioned by 1,000 workers at WSC losing their jobs. Some portion of the laid-off WSC employees will not find jobs. After unemployment benefits run out, they are likely to enter poverty. If 6.0% (the January 2003 unemployment rate) of those who lose their jobs at WSC do not find work after 26 weeks, then 60 of the 1,000 laid-off workers and their families (average persons per household is approximately 2.4) might be thrown into poverty. Considering the 2.8 employment multiplier effect, it is possible that in total 168 previously employed persons would enter poverty status. This would be an increase of about 1% in the number of persons in poverty, and the poverty rate would rise by less than 1/2 of a percent.

3.6 CONCLUSION

This chapter provided an estimate of the potential socioeconomic impact of compliance. The impact on employees and the community for every 1000 jobs lost is significant, and the closure of WSC would devastate the Weirton community – particularly the West Virginia part of the community. Specifically, this chapter showed that:

- Unemployment is about 5% higher in the community than in the nation
- Household and per capita income are between 20 and 25% below national averages
- The rate of poverty in the community is slightly higher than the nation, and could increase ½% if 1,000 jobs were lost at WSC
- State spending on unemployment compensation could rise by $9.0 million in the first year after 1,000 jobs were lost at WSC
- 1/3 of the city of Weirton's tax revenues come from WSC. WSC contributes more than 20% of the personal and real property taxes paid to Hancock and Brooke County. The counties of Hancock and Brooke could lose several hundred thousand dollars in property taxes
- For every 1,000 jobs lost at WSC, the local economy will lose about $52 million in earnings

[42] Source: US Census Bureau, QT-P34. Poverty Status in 1999 of Individuals: 2000. at http://factfinder.census.gov/servlet/QTTable?_ts=68637416281 on April 17, 2003.
[43] Source: Ibid. http://factfinder.census.gov/servlet/QTTable?_ts=68637448703 on April 17, 2003.

- State income tax revenue could decline about $2.4 million, and state sales taxes by as much as $2 million with the loss of 1,000 WSC jobs
- Household income in the area would drop
- Many workers will be tempted to leave the community rather than accept lower wages in the community.

Appendix A: Costs of Compliance

Total Iron and Lead Removal	Material	Labor	Total
Gravity Filter (purchased and delivered)			
-20 filters 9'6" by 60' long	$ 3,200,000		$ 3,200,000
-Concrete for filter cells	$ 525,000	$ 1,050,000	$ 1,575,000
-Installation of internals, valves, piping, and electrical (includes 3 air blowers and 2 backwash pumps)		$ 2,500,000	$ 2,500,000
Pump Sump to get Water to Filters	$ 260,000		$ 260,000
-P&D Pumps and motors		$ 225,000	$ 225,000
-Install pumps and electric	$ 40,000	$ 80,000	$ 120,000
-Concrete for pump sump	$ 100,000	$ 200,000	$ 300,000
-P&I pipe sump to filters			
Backwash thickener unit, 50' Dia. By 12' sidewall depth			
-Purchase and deliver	$ 700,000		$ 700,000
-Concrete for thickener foundation 200cyd	$ 50,000	$ 90,000	$ 140,000
-Installation of thickener and slurry suction pipe		$ 550,000	$ 550,000
Plate and frame press (2)			
-Purchase and deliver	$ 300,000		$ 300,000
-Installation with feed pumps and slurry pipe		$ 350,000	$ 350,000
Polymer mix and feed units			
-Purchase and deliver	$ 25,000		$ 25,000
-Installation		$ 15,000	$ 15,000
Building for press, polymer units, Electric MCC and control room	$ 65,000	$ 65,000	$ 130,000
-Chemical feed to convert soluble iron to insoluble	$100,000	$ 100,000	$ 200,000
Total Equipment and Installation	$ 5,400,000	$ 5,200,000	**$ 10,600,000**
Overhead and Contingencies (Rounded)			
-Spares at 5% of installation cost (IC)			
-Construction Management (10% of IC)	$ 530,000		$ 500,000
-Engineering design (12% of IC		$ 1,100,000	$ 1,100,000
-Contingency (25% of IC)		$ 1,300,000	$ 1,300,000
	$ 1,340,000	$ 1,310,000	$ 2,650,000
GRAND TOTAL- TOTAL IRON REMOVAL			**$ 16,200,000**

Numbers may not add correctly due to rounding

TEMPERATURE REDUCTION	MATERIAL COST	LABOR COST	TOTAL COST
Cooling Tower			
-Site Prep		$ 25,000	$25,000
-Installation of electrics for 16 fans at 200 Hp. Ea.	$280,000	$ 370,000	$650,000
-P&D cooling tower (16 Cells, each 52' by 50')	$5,950,000		$5,950,000
-Cooling tower installation (25,000 hours)		$1,750,000	$1,750,000
-Concrete basin	$700,000	$1,300,000	$2,000,000
Pump sump			
-P&D 6 pumps and motors (300Hp)	$400,000		$ 400,000
-Installation-mechanical & electric for pumps		$450,000	$ 450,000
-Concrete for pump sump	$ 45,000	$ 85,000	$ 130,000
-Piping & valves pump sump to cooling water	$550,000	$700,000	$1,250,000
-Piping cooling tower to Harmon Creek	$120,000	$180,000	$ 300,000
-Tower chemical storage & feed (shock treatment)	$ 35,000	$ 40,000	$ 75,000
-Building for chemical feed, MCC & instrumentation	$ 35,000	$ 35,000	$ 70,000
TOTAL EQUIPMENT AND INSTALLATION	$8,100,000	$4,900,000	$13,000,000
Overhead and Contingencies (Rounded)			
-Spare parts at 5% of installation cost (IC)	$ 700,000		$700,000
-Construction management at 10% of IC		$1,300,000	$1,300,000
-Engineering design at 12% IC		$1,600,000	$1,600,000
-Contingency (25% of IC)	$2,000,000	$1,200,000	$3,200,000
GRAND TOTAL-TEMPERATURE REDUCTION			**$19,800,000**
TOTAL TOTAL			**$36,000,000**

Numbers may not add correctly due to rounding

OPERATING COSTS

Operating Costs	Temperature Control		Total Iron and Lead Control	
Electricity $360/HP-Yr	5,800 Hp	$ 2,400,000	1,200 Hp	$ 500,000
Chemicals		$ 45,000	Polymer	$ 80,000
Sludge disposal	N/A		$ 30/cyd	$ 200,000
Operators/supervisor @ $40/Hr	1,040 Hrs	$ 70,000	18,720 hrs	$ 1,300,000
Annual Maintenance	10% of installed cost	$ 1,310,000		$ 1,100,000
Estimated Annual O & M Cost		**$ 3,825,000**		**$3,200,000**

Numbers may not add correctly due to rounding

Appendix B: EPA INTERIM ECONOMIC GUIDANCE FINANCIAL TESTS

In Chapter 3.2 of EPA's *Interim Economic Guidance for Water Quality Standards,*[44] one primary and three secondary measures of financial impacts are identified. The **primary measure is profits.** What is profitability now, and how much will profits decline due to pollution control expenditures? The secondary measures relate to liquidity, solvency, and leverage. EPA prescribes computing profit and solvency measures with and without the additional compliance costs. EPA states that "the results of the four tests should be considered jointly to obtain an overall picture of the economic health of the applicant and the impact of the water quality standards requirement on the applicant's health." EPA's guidance also prescribes (i) comparing the results to ratios for other entities in the same industry, (ii) calculating the ratios for several years, and (iii) examining the parent firm as well as the applicant's financial health.[45]

Primary Measure -- Profits

Profit Test. *Earnings before taxes divided by revenues (EBT/Revenues).* This test is the ratio of earnings before taxes divided by revenues. The guidance makes no provision for unusual events that might cause the earnings before tax to be an overstatement or understatement of on-going profitability (except to recommend a three-year averaging). This ratio, both before and after compliance costs, is compared to the ratio for comparable companies in the industry to assess the financial condition of the applicant.

The impact of the project on profitability is determined by computing the "annualized project costs." The data required to compute the "annualized project costs" are (1) the capital cost of the project; (2) the interest rate for financing the project; (3) the time period over which the project will be financed; and (4) the annual costs of operation and maintenance of the project. The interest rate and time period are used to obtain an "annualization factor." This annualization factor is multiplied by the capital costs to obtain an annual capital cost. EPA prescribes adding the annual capital costs and the annual costs of operation and maintenance together to obtain the total annual costs of the project. This amount is then subtracted from the profit before tax to obtain a post compliance numerator for the ratio of EBT/Revenue.

Secondary Measures – Liquidity, Solvency, and Leverage

The secondary measures are *liquidity ratios, solvency ratios, and leverage ratios.* All three categories of ratios indicate the company's general ability to meet its short- and long-term financial obligations. The purpose of liquidity ratios is to measure the adequacy of current assets to meet current obligations. Solvency ratios, in turn, gauge the ability of a firm to service its

[44] *Interim Economic Guidance for Water Quality Standards,* February 1997 update of March 1995 handbook, U.S.E.P.A., Office of Water.
[45] There is no parent to WSC.

fixed and long-term obligations. Leverage ratios show the proportion of a firm's invested capital that is obtained from debt versus equity and thereby provides a measure of its ability to obtain external financing for the pollution control project. The following specific ratios are obtained for 1994-1996:

Liquidity Ratio. *Current Ratio* -- defined as current assets divided by current liabilities. This ratio not only measures a firm's liquidity but also the margin of safety that management maintains to allow for any unevenness in the flow of funds through the current asset and current liability accounts.

Solvency Ratio. *Beaver's Ratio* -- defined by EPA as cash flow (approximated by net income plus depreciation) divided by total debt. Like the profit ratio, the numerator and denominator of this ratio, as defined by EPA are not consistent with GAAP and SEC requirements. For example, the EPA guidance does not address preferred stock. In WSC's case there is a "put" provision associated with its preferred stock that requires WSC to treat it as debt in its calculations for the investment community. Also, the simplification of cash flow as being the sum of net income and depreciation is also inconsistent with GAAP. Publicly traded companies provide sources and uses of funds statements as part of their financial reporting to the SEC. These statements include "cash flow from operations." In addition to net income and depreciation, numerous other items that affect the company's cash position are included. According to the EPA, the Beaver's Ratio is a "good indicator of the likelihood of bankruptcy."[46] Ratios below .15 indicate the potential for serious problems meeting financial obligations. A ratio above .2 suggests no problems. Ratios between .15 and .2 suggest uncertainty about the company's ability to meet its long-term financial obligations.

Leverage Ratio. *Ratio of long-term liabilities to shareholders' equity* -- defined as long-term liabilities divided by shareholders equity. This ratio is used to express the balance between lenders' claims on the company and the residual available to ownership funds. The ratio shows the relative size of the "cushion" of ownership funds which creditors can rely upon to absorb possible losses from operations, decreases in asset values, and poor estimates of future funds flows.

As prescribed in the EPA guidance, the various financial tests are calculated for the three-year period 2000 to 2002 and for 2002 alone. By using the three-year averages, unusual annual conditions can be smoothed. By looking at the most recent year, the most up-to-date assessment of WSC's financial state is pictured.

[46] *Interim Economic Guidance for Water Quality Standards*, p. 3-9.

Appendix C
Underlying Financial Data

AK Steel

	2000-2002	2000	2001	2002
Revenues	$ 4,175,367	$ 4,403,700	$ 3,833,400	$ 4,289,000
Earnings Before Tax	$ (245,033)	$ 212,600	$ (144,800)	$ (802,900)
Net Income after Tax	$ (144,267)	$ 134,000	$ (91,200)	$ (475,600)
Depreciation	$ 226,167	$ 227,300	$ 225,800	$ 225,400
Current Assets	$ 1,589,767	$ 1,521,800	$ 1,547,800	$ 1,699,700
Inventories	$ 874,433	$ 848,400	$ 904,600	$ 870,300
Current Debt	$ 67,900	$ 63,200	$ 78,000	$ 62,500
Current Liabilities	$ 901,667	$ 890,300	$ 954,400	$ 860,300
Long Term Debt	$ 1,324,000	$ 1,387,600	$ 1,324,500	$ 1,259,900
LT Liabilities	$ 2,666,500	$ 3,030,200	$ 959,200	$ 4,010,100
Owner's Equity	$ 960,633	$ 1,319,300	$ 1,033,300	$ 529,300
Beaver Ratio	0.06	0.25	0.10	(0.19)
Debt to Equity	2.78	2.30	0.93	7.58
Current Ratio	1.76	1.71	1.62	1.98
Profitability	(0.06)	0.05	(0.04)	(0.19)

Bethelehem Steel

	2000-2002	2000	2001	2002
Revenues	$ 3,667,033	$ 4,094,400	$ 3,334,300	$ 3,572,400
Earnings Before Tax	$ (606,300)	$ (143,400)	$ (965,600)	$ (709,900)
Net Income after Tax	$ (922,533)	$ (118,400)	$ (1,949,600)	$ (699,600)
Depreciation	$ 253,233	$ 260,300	$ 253,100	$ 246,300
Current Assets	$ 1,178,400	$ 1,146,400	$ 1,202,500	$ 1,186,300
Inventories	$ -	$ -	$ -	$ -
Current Debt	$ 256,800	$ 55,400	$ 19,300	$ 695,700
Current Liabilities	$ 748,700	$ 927,200	$ 271,600	$ 1,047,300
Long Term Debt	$ 503,700	$ 798,000	$ 628,200	$ 84,900
LT Liabilities	$ 5,118,100	$ 3,419,800	$ 5,652,900	$ 6,281,600
Owner's Equity	$ (1,336,900)	$ 1,120,000	$ (1,680,500)	$ (3,450,200)
Beaver Ratio	(0.88)	0.17	(2.62)	(0.58)
Debt to Equity	(3.83)	3.05	(3.36)	(1.82)
Current Ratio	1.57	1.24	4.43	1.13
Profitability	(0.17)	(0.04)	(0.29)	(0.20)

Source: Company data presented by Multex Investor Services through the Wall Street Journal Online Databank

Ispat International N.V. CL A ADS

	2000-2002	2000	2001	2002
Revenues	$ 4,906,000	$ 5,343,000	$ 4,486,000	$ 4,889,000
Earnings Before Tax	$ (106,667)	$ 122,000	$ (418,000)	$ (24,000)
Net Income after Tax	$ (61,000)	$ 99,000	$ (312,000)	$ 30,000
Depreciation	$ 177,000	$ 177,000	$ 177,000	$ 177,000
Current Assets	$ 1,686,667	$ 2,005,000	$ 1,443,000	$ 1,612,000
Inventories	$ 897,667	$ 1,015,000	$ 805,000	$ 873,000
Current Debt	$ 330,333	$ 391,000	$ 338,000	$ 262,000
Current Liabilities	$ 1,305,667	$ 1,434,000	$ 1,209,000	$ 1,274,000
Long Term Debt	$ 2,062,333	$ 2,124,000	$ 2,041,000	$ 2,022,000
LT Liabilities	$ 3,845,333	$ 3,660,000	$ 3,766,000	$ 4,110,000
Owner's Equity	$ 450,000	$ 884,000	$ 338,000	$ 128,000
Beaver Ratio	0.05	0.11	(0.06)	0.09
Debt to Equity	8.55	4.14	11.14	32.11
Current Ratio	1.29	1.40	1.19	1.27
Profitability	(0.02)	0.02	(0.09)	(0.00)

Rouge Steel

	2000-2002	2000	2001	2002
Revenues	$ 1,050,119	$ 1,099,811	$ 923,546	$ 1,127,001
Earnings Before Tax	$ (87,902)	$ (82,004)	$ (119,663)	$ (62,039)
Net Income after Tax	$ (99,504)	$ (119,266)	$ (119,663)	$ (59,583)
Depreciation	$ 35,829	$ 56,711	$ 25,992	$ 24,783
Current Assets	$ 351,638	$ 413,714	$ 318,225	$ 322,975
Inventories	$ 240,917	$ 269,245	$ 232,937	$ 220,568
Current Debt	$ 82,243	$ -	$ 145,549	$ 101,181
Current Liabilities	$ 318,815	$ 295,954	$ 360,915	$ 299,576
Long Term Debt	$ 50,500	$ 66,500	$ -	$ 85,000
LT Liabilities	$ 507,932	$ 448,172	$ 502,734	$ 572,891
Owner's Equity	$ 180,976	$ 292,846	$ 170,573	$ 79,509
Beaver Ratio	(0.48)	(0.94)	(0.64)	(0.19)
Debt to Equity	2.81	1.53	2.95	7.21
Current Ratio	1.10	1.40	0.88	1.08
Profitability	(0.08)	(0.07)	(0.13)	(0.06)

Source: Company data presented by Multex Investor Services through the Wall Street Journal Online Databank

National

	2000-2002	2000	2001	2002
Revenues	$ 2,693	$ 2,979	$ 2,492	$ 2,609
Earnings Before Tax	$ (288)	$ (137)	$ (519)	$ (207)
Net Income after Tax	$ (310)	$ (130)	$ (652)	$ (149)
Depreciation	$ 161	$ 153	$ 168	$ 161
Current Assets	$ 694	$ 768	$ 637	$ 676
Inventories	$ 440	$ 525	$ 390	$ 406
Current Debt	$ 81	$ 114	$ 129	$ -
Current Liabilities	$ 536	$ 589	$ 715	$ 304
Long Term Debt	$ 487	$ 523	$ 810	$ 129
LT Liabilities	$ 1,991	$ 1,260	$ 1,904	$ 2,810
Owner's Equity	$ (166)	$ 718	$ (311)	$ (905)
Beaver Ratio	(0.26)	0.04	(0.52)	0.09
Debt to Equity	(12.00)	1.76	(6.13)	(3.11)
Current Ratio	1.29	1.30	0.89	2.22
Profitability	(0.11)	(0.05)	(0.21)	(0.08)

Source

Income statement from the 2002 10-K.

Balance sheet items from the 2002 10-K for 2002 and 2001. 2000 from the 2001 10-K.

WPC Corp

	2000-2001	2000	2001	2002
Revenues	$ 955,408	$ 1,050,590	$ 835,640	$ 979,993
Earnings Before Tax	$ (105,364)	$ (86,340)	$ (172,197)	$ (57,556)
Net Income after Tax	$ (135,454)	$ (176,581)	$ (172,214)	$ (57,567)
Depreciation	$ 72,174	$ 69,778	$ 72,551	$ 74,194
Current Assets	$ 323,693	$ 344,309	$ 296,067	$ 330,704
Inventories	$ 212,163	$ 279,282	$ 173,117	$ 184,091
Current Debt	$ 132,653	$ 135,264	$ 127,204	$ 135,490
Current Liabilities	$ 342,439	$ 400,105	$ 296,254	$ 330,959
Long Term Debt	$ 123,247	$ 356,563	$ -	$ 13,177
LT Liabilities	$ 885,752	$ 769,713	$ 948,215	$ 939,328
Owner's Equity	$ (140,177)	$ 144,245	$ (253,604)	$ (311,171)
Beaver Ratio	(0.25)	(0.22)	(0.78)	0.11
Debt to Equity	(6.32)	5.34	(3.74)	(3.02)
Current Ratio	0.95	0.86	1.00	1.00
Profitability	(0.11)	(0.08)	(0.21)	(0.06)

Source

2001 and 2002 from Form 10-12G filed on May 30, 2003.

2000 Balance sheet from 9.30.00, last quarter before filing for bankruptcy protection.

2000 income from Form 10-12G filed on May 30, 2003.

Weirton Steel

	2000-2002 Base Case	2000	2001	2002	2000-2002 With Compliance
Revenues	$1,038,115	$1,117,829	$960,358	$1,036,159	$1,038,115
Earnings Before Tax	-$198,781	-$96,723	-$378,590	-$121,031	-$211,828
Net Income after Tax	-$245,009	-$85,116	-$532,355	-$117,556	-$258,056
Depreciation	$64,782	$63,968	$65,194	$65,185	$68,482
Current Assets	$291,581	$360,387	$247,246	$267,109	$291,581
Inventories	$168,227	$202,377	$136,850	$165,454	$168,227
Current Debt	$151,552	$0	$331,052	$123,605	$151,552
Current Liabilities	$350,069	$167,174	$509,202	$373,831	$350,069
Long Term Debt	$217,860	$299,253	$67,806	$286,522	$254,860
LT Liabilities	$830,662	$760,297	$676,623	$1,055,066	$867,662
Owner's Equity	-$379,824	$62,900	-$469,591	-$732,782	-$379,824
Beaver Ratio	(0.49)	(0.07)	(1.17)	(0.13)	(0.47)
Debt to Equity	(2.19)	12.09	(1.44)	(1.44)	(2.28)
Current Ratio	0.83	2.16	0.49	0.71	0.83
Profitability	(0.19)	(0.09)	(0.39)	(0.12)	(0.20)

Source: WSC 10-K reports

ACACIA
Environmental Group LLC

June 23, 2003

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ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

Dr. Ed Snyder
Chairman
Environmental Quality Board
1615 Washington Street, East
Suite 301
Charleston, WV 25311-2126

Re: Triennial Review of Water Quality Standards (46 CSR 1)

Dear Mr. Snyder:

Acacia Environmental Group LLC appreciates this opportunity to submit written comments on the proposed revisions to the Requirements Governing Water Quality Standards (46 CSR 1).

These comments are submitted on behalf of the Contractors Association of West Virginia, West Virginia Coal Association, West Virginia Chamber of Commerce, West Virginia Farm Bureau, West Virginia Forestry Association, and the West Virginia Manufacturers Association.

Respectfully submitted this 23rd day of June, 2003.

Sincerely

Joyce McCune Gentry
Senior Consultant

cc: Edward M. Snyder, Ph.D
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Comments on
The West Virginia Environmental Quality Board's
Proposed Changes to the
Requirements Governing Water Quality Standards
Dated May 19, 2003

Submitted on Behalf of the

Contractors Association of West Virginia
West Virginia Coal Association
West Virginia Chamber of Commerce
West Virginia Farm Bureau
West Virginia Forestry Association
West Virginia Manufacturers Association

June 23, 2003

Prepared by
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Acacia Environmental Group LLC

ACACIA
Environmental Group L.L.C.

1310 Laidley Tower
Charleston, West Virginia 25301

The following technical comments on the West Virginia Environmental Quality Board's proposed changes to the Legislative Rule Requirements Governing Water Quality Standards, dated May 19, 2003, are submitted on behalf of the Contractors Association of West Virginia, the West Virginia Coal Association, West Virginia Chamber of Commerce, West Virginia Farm Bureau, West Virginia Forestry Association, and the West Virginia Manufacturers Association["Association Commenters"]

Acacia Environmental Group LLC ("AEG") is an environmental consulting firm based in West Virginia. The 2003 triennial review of water quality standards by the Environmental Quality Board ("Board") will have a significant effect on the members of the Association Commenters.

Attachment I, **Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria**, is provided to illustrate the numerous changes to the existing standards. New parameters are identified in blue ink. Changes to existing parameters are identified in red ink. Use of inappropriate EPA standards, i.e. drinking water standards, is identified in green ink.

AEG has identified several general areas where the proposed revisions to the West Virginia Water Quality Standards are inappropriate or scientifically unsupportable:

- Numerous proposed standards are inappropriate in their application to the Designated Use Category. For example, using National Primary Drinking Water Standards values to apply to Acute or Chronic Aquatic Life criteria is scientifically indefensible without additional demonstration that these are appropriate values to protect aquatic life. Similarly, a number of proposed criteria more appropriately apply to ground water used for potable water rather than for surface water (such as the proposed Radon Criterion or the use of "at the tap" drinking water standards for metals in surface water).

- Numerous proposed numeric criteria values are inappropriate based on the assumptions used in their development. Risk-based criteria for cancer causing agents are developed based on the consumption of water and aquatic life over a 70-year life span. USEPA's recommended criteria are predicated on no more than one (1) additional cancer death per one million (1,000,000) people over this 70 year life span. The recommended numbers are then based on the assumption that these values will be implemented using Harmonic Mean Flow conditions since these represent an "average" concentration during the lifetime of the individual. Using these National Recommended Criteria values with West Virginia's 7Q10 flow conditions means that these numbers are more protective than EPA's basis for recommending the value. The question the Board must answer is "What is the protection level the Board is using to establish criteria if it is not using the nationally recommended "1 per million" assumptions? Is it 1 per 5 million? 1 per 10 million?" The Board (and the Legislature) has not determined that a different protection level is to be used in West Virginia and the Board should not be using criteria numbers with different assumptions than those used to develop the National Recommendation values.

- There are a number of proposed criteria that are significantly lower than the ability of any accepted analytical method to measure. For example, the proposed standard for 2,3,7,8 TCDD (dioxin) is 2000 times lower than the minimum detection limit for the EPA approved method and is lower than the minimum detection limit for the experimental High Volume Sampling technique (which is not an EPA recognized or approved method). Similarly, the proposed Human Health criterion for PCBs is significantly below the detection limit for the approved analytical methods. The Board cannot propose Water Quality Standards that are unmeasurable and unenforceable.

- There are a number of proposed criteria that are inconsistent with National Recommended Criteria Values. For example, the National Drinking Water Standard for Uranium is 30 µg/L not the 20µg/L in the proposed Numeric Criteria.

- There are several instances where important wording in the current Water Quality Standards has been deleted. These deletions change the implication and impact of the Rule significantly. This is especially true for the Turbidity criterion language and for the language used for Radionuclides.

- A number of proposed numeric criteria must be questioned on the basis of what value they have for West Virginia. EPA does not require states to adopt water quality standards for all possible pollutants. A classic example is aluminum, which has not had criteria adopted by most states but which is the cause of large numbers of West Virginia waters being placed on the 303(d) list as impaired. Of the five surrounding states (Kentucky, Maryland, Ohio, Pennsylvania and Virginia), only Pennsylvania has aluminum in its water quality standards. ORSANCO also has no aluminum criterion in its Water Quality Standards. Although EPA may recommend adoption of criteria, it does not require that all recommended criteria be adopted when there is no demonstration that the substance impairs the uses of the state's waters. West Virginia should adopt only those criteria that are reasonably expected to be problematic in state waters.

- There are some significant errors in the transcript of footnotes from the EPA Recommended Criteria to the Board proposed. Toluene was listed as a carcinogen by the board proposal and is not listed in the EPA Recommended Criteria. Specific numerical criterion is given for Copper in the Board proposal. The EPA Recommended Criteria has the same numerical values but contains a footnote with a hardness dependent formula, which was used to calculate the numerical values. Specific numerical criterion is given for pentachlophenol in the Board proposal. The EPA Recommended Criteria has the same numerical values but contains a footnote with a pH dependent formula, which was used to calculate the numerical values.

- The Board has added language to the Standard to allow the use of "organoleptic criteria" where appropriate.

The following are specific comments on others aspects of the proposed changes to West Virginia's Water Quality Criteria:

Proposing Criteria Below the Limits of Detection of Analytical Methods

Comparing the list of proposed criteria with the "approved" analytical methods shows a significant problem with the criteria. Many of the proposed values are significantly below the Minimum Detection Limit. Although it may be argued that these could be implemented based on "end-of-pipe" analysis, many of these criteria are so restrictive that this may not be possible. We would also point out both the high costs of methods like "High Resolution GC-High Resolution MS with Isotope Dilution." The increased analytical costs to permit holders and especially the costs of investigating false positive tests or falsely high test results can be significant. We would also point out that adopting criteria levels below detection limits means that it will be impossible to determine whether a water is impaired for 303(d) listing purposes and for the development of Total Maximum Daily Loads.

Attachment II, **Method Detection Limit Information**, shows the USEPA Approved Analytical Methods for each criteria and highlights those criteria that are significantly lower than the method detection limit or Practical Quantitation Limit.

Metals

In a number of cases (Lead, Cadmium, Arsenic) the Board has proposed the use of USEPA's Drinking Water Standards as criteria for Category B. This is inappropriate since these are intended to be the action limits for potable water systems and do not necessarily reflect a scientifically defensible criterion for surface water to protect fish and other aquatic life. In addition, it appears the Board's proposal has listed total copper instead of listing the values for the dissolved fraction.

Radionuclides

West Virginia does not have any nuclear power facilities or any significant industrial facility that discharges radionuclides. Radiation sources in our waters are naturally occurring remnants of radioactive decay of elements in the rocks and soil of the state. West Virginia is right in removing the criteria tritium since these are unlikely to be present at unacceptable levels in state surface waters.

The proposed Water Quality Standards contain several significant problems or misapplications of Federal Recommendations:

1. The proposed Radon criterion of 300 picocuries/L is based on the Primary Drinking Water Standards for Groundwater. USEPA does not recommend or require a radon standard for Surface Waters because the rapid evaporation of radon from Surface Waters causes radon levels in these waters to be below the level of regulatory concern. Applying the Drinking Water and Groundwater Standard to surface waters is inappropriate in this case.

2. The proposed standard of "total Beta and Photon activity" of 4 mrem is more accurately given as 4 mrem/year and is a permitted maximum dose from all

sources rather than a measure of water quality. It is difficult to see how WVDEP could implement this standard for surface water in the absence of numeric criteria for the sources of the Beta and photon activity. USEPA is attempting to move away from dose-based criteria to more specific nuclide criteria.

3. The proposed criterion for Uranium is both inaccurate and unnecessary. The USEPA Recommended Criterion for Uranium is 30 µg/L (effective 12/08/03) not the 20 µg/L listed in the proposed criteria. This is a Ground Water and Drinking Water criterion and we are unaware of areas in West Virginia where this would be a significant issue for surface waters.

4. The proposed criteria have a typographical error. The proposed radium-226 and radium-228 standard from the USEPA Drinking Water and Ground Water Recommendations (11/02) is 5 picocuries/L. The ORSANCO recommended criterion is 4 picocuries/L for the Ohio River.

5. There is a significant deletion in these proposed standards. In the existing Water Quality Standards there is an exclusion that does not require isotopic analysis of radium if the total radioactivity of the sample is less than 5 picocuries/L. By removing this exclusion, the implication is that a permit holder could be required to do an expensive isotopic analysis even if water in question did not exceed the total activity criterion. Based on a brief review of the Internet this could cost in excess of $170 per sample.

Polychlorinated Biphenyls

There are 209 different congeners regulated as polychlorinated biphenyls ranging from monochlorobiphenyl to decachlorobiphenyl. The proposed criterion for PCBs is 0.000044 µg/L or 44 picograms/L **total** PCBs. We assume there is a typographical error with this value. The USEPA Recommended Criterion for PCB is listed as 0.000064 µg/L (December 8, 2003). Either value is scientifically indefensible considering that the most sensitive method of analysis for PCBs (USEPA Method 1668-Hiigh Resolution GC- High Resolution MS with isotope dilution) has minimum detection limits of 0.5 to 50 picograms/L for each congener. If we accepted the scientific basis for such a stringent limit based on toxicological data (which we do not believe to be scientifically valid), establishing a TOTAL PCB limit (for 209 congeners) to a value less than the Minimum Detection Level of a single congener is not defensible. Assuming an average Minimum Detection Limit of 20 picograms/L for each congener (quoted in USEPA Method 1668A Table 2), a calculated Minimum Detection Limit for the range of congeners would be no less than 4180 picograms/L or 0.0042 µg/L or 4.2 parts-per-trillion. We believe that the current Water Quality Standard criterion of 0.044 µg/L or 44 parts-per-trillion is both more scientifically defensible and also measurable using approved analytical methods. We urge the Board to retain or relax the current Water Quality Criteria for polychlorinated biphenyls.

Dioxins

The toxicology and level of toxicity of dioxins is a subject of considerable scientific debate that is intensely politicized. Although some studies have appeared to show high levels of toxicity for the range of halogenated dioxins and related dibenzofurans, epidemiological studies of exposed human populations and many other toxicological studies do not support these assessments. However, recognizing that USEPA views these compounds as highly toxic, the question becomes "What is the appropriate Water Quality Criterion for West Virginia?" West Virginia currently regulates only 2,3,7,8-tetrachlorodibenzodioxin (2,3,7,8-TCDD) at the 0.013 pg/L level in drinking water or 13 parts-per-quintillion. This is significantly below the 10 pg/L (10 parts-per-quadrillion) minimum detection limit for the most sensitive analytical method for dioxins (USEPA Method 1613A). The regulated community has argued repeatedly that West Virginia's Water Quality Criterion for 2,3,7,8-TCDD was flawed and scientifically indefensible. The Board now proposes to lower the 13 parts-per-quintillion standard to 5 parts-per-quintillion. We are unaware of any credible scientific basis to justify USEPA's and the Board's proposed reduction in TCDD limits. It could be argued that the experimental and unapproved "High Volume Sampling technique" which was used by USEPA to establish Total Maximum Daily Loads (TMDLs) for 2,3,7,8-TCDD for the Ohio and Kanawha Rivers in 2001 could, in theory, measure down to 10 parts-per-quintillion. However, the proposed criterion of 5 parts-per-quintillion is below even that technique's ability to measure dioxins. Beyond that, we would point out that the High Volume Sampling Technique is not an approved USEPA methodology and is considered by them to be prohibitively expensive. We would also point out to the Board that USEPA contracted additional High Volume Sampling for dioxins in the Ohio and Kanawha Rivers in the summer of 2001 but that those results have not been released by USEPA at this date due to QA/QC issues which make the validity of the data questionable. The Board cannot justify a further reduction in the water quality criterion for dioxins and should consider whether it is more appropriate to establish a higher limit that is measurable. We would also raise the question to the Board as to whether lowering the limit on TCDD would require a review and revision of the TMDLs for dioxin in the Ohio and Kanawha Rivers.

Priority Pollutants-Carcinogens

Criteria values for carcinogens are calculated on the basis of an increased risk of one cancer per million population over a 70 year lifetime. Current West Virginia Water Quality Standards specifically require the 10^{-6} risk factor. A 10-6 risk factor has, of course, been the historic policy of this Board for the regulation of carcinogens. An inherent part of defining the numeric criteria for carcinogens is the assumption that these will be implemented using Harmonic Mean Flow to calculate permit limits and acceptable stream loadings. The practice of using the 7Q10 stream flows with Recommended Criteria calculated assuming Harmonic Mean Flow means that West Virginia is adopting criteria, which are inconsistent both with federal guidelines and with the specific language of our own Water Quality Standards. The Board (and the Legislature) must either determine that West Virginia will use a more restrictive standard for risk than 10^{-6} **OR** adopt the use of Harmonic Mean Flows for carcinogens. Attachment III show the current carcinogens listed in the Water Quality Standards and the proposed new additions to the Water Quality Standards, which EPA lists as carcinogens. EPA's Recommended Criteria are based on the 10^{-6} risk factors and should only be used with Harmonic Mean Flow conditions. We

urge the Board to either adopt the Harmonic Mean Flow designation for these pollutants or delay adoption until the issue of the use of Harmonic Mean Flow versus 7Q10 can be resolved in the Legislature. An alternative might be to recalculate the proposed standard on the basis of the 7Q10 flow using the statistically based relationships developed by USEPA as reported in the Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001, March 1991 page 88). Attachment III, **Comparison of the USEPA Recommend Harmonic Mean Flow to WV 7Q10 flow for 10^{-6} Cancer Risk Calculations for Existing Compounds**, is provided to demonstrate the affect on numerical criteria.

In addition to the carcinogens currently listed in the Water Quality Standards, a substantial fraction of the newly listed compounds are listed by EPA as carcinogens and should also be adopted only if the Harmonic Mean Flow is used in their implementation. Attachment IV, **Comparison of the USEPA Recommend Harmonic Mean Flow to WV 7Q10 flow for 10-6 Cancer Risk Calculations for Proposed Compounds**, is provided to demonstrate on numerical criteria.

A defensible alternative would be to adopt criteria with a 10^{-6} risk basis by converting the EPA Recommended criteria to their 7Q10 equivalents. USEPA's Technical Support Document gives the relationship between Harmonic Mean Flow and 7Q10-based criteria with a modal value of 2.5. Using that relationship, the Board could adopt defensible criteria based on 7Q10 flows for carcinogens as provided for in Attachment III and Attachment IV.

The Use of Organoleptic Criteria

The Proposed Standards allow the use of "organoleptic criteria where appropriate". Organoleptic criteria are not health-based criteria but are established to avoid tainting the taste of fish. In most cases the organoleptic criteria are substantially below the health based criteria and this could create a significant permitting issue. The Board should not adopt more stringent criteria by reference. If the Board wishes to adopt the more stringent organoleptic criteria, they should so specify and submit this to public comment. In addition to the eight criteria listed below, there are another fifteen organoleptic criteria for pollutants not on the proposed standards that could arguably be incorporated into the state's Water Quality Standard by reference without going through public comment. Attachment V, **Organoleptic Standards**, provides the current value proposed in the WV standard and the organoleptic based standard from the EPA Recommended Criteria (December 8, 2002).

Nitrosamines

The proposed Water Quality Standard adds six specific N-nitrosamines to the list of regulated compounds and in addition adds a generic nitrosamine category with a Category A value of 0.0008 micrograms/L or 0.8 parts-per-trillion. Of the six newly listed compounds, four are not priority pollutants. Only one of the proposed Nitrosamines has a Category A value below the proposed generic standard (n-nitroso-dimethylamine has value of 0.69 ppt versus 0.8 ppt for the generic value). Four of the six have Human Toxicity values greater than the "nitrosamine" standard. It is of dubious value to adopt standards for individual compounds when the more stringent "generic" criterion is also proposed. Beyond that, these proposed levels are

significantly below the limits of detection for EPA approved analytical methods. Specifically, EPA Method 8070a involves extraction to concentrate the analyte followed by Gas Chromatographic analysis has detection limits for the individual Nitrosamines ranging from 0.15 µg/L (150 parts- per-trillion) to 0.86 µg/L (860 parts-per-trillion). The Board should not be proposing Water Quality Criteria that are more than 200 times lower than the limits of detection of EPA-approved analytical methods.

Chloroform

Chloroform is still listed a carcinogen in the Board proposal. In October 19, 2001, EPA published a full Toxicological Review of Chloroform and revised IRIS file for chloroform. In this new evaluation of chloroform EPA has determined that cancer effects seen in animals were secondary to cellular proliferative effects. On that basis, the October 2001 document established an oral cancer reference dose (RfD) of 10 µg/L/day. The final ambient water quality criterion for chloroform is likely to fall between 65 and 275 µg/L.

Non-priority Pollutants

The state is not required to adopt EPA's Recommended Criteria for materials that are not priority pollutants. There are a number of the proposed criteria which are of doubtful value to West Virginia and which should not be adopted.

Mirex was an insecticide primarily used in the Southeastern states to control fire ants and which was also used as a flame retardant for plastics, etc. The use of Mirex was discontinued in the United States in 1972 (ATSDR Fact Sheet 9/96). There is no reason to believe that it is present in West Virginia waters today at a measurable level.

Tributyl tin is used as an antifouling agent in paint on ocean going vessels. The use of Tributyl tin as an antifouling agent in paint for vessels less than 25 meters in length was banned by USEPA in 1989. While it may be appropriate for coastal states to be concerned about tributyl tin in estuarine and coastal waters and sediments, there is no reason to believe that West Virginia's waters have any measurable levels of tributyl tin. The Board should not adopt criteria, which are not considered to be likely contaminants in state waters.

While a number of the proposed criteria for non-priority pollutants are for pesticides (Parathion, Malathion, Methoxyclor, Demeton, 2,4,5-TP, 2,4-D) which may or may not have been used in West Virginia and for which no showing has been made that there is any evidence of impairment of West Virginia's waters by these materials. The Board should not be adopting criteria for these materials based on the assumption that they are a problem in other state's waters.

Turbidity

West Virginia's current criterion for turbidity was adopted in 1980 and has not been changed since. This standard was developed using the recommended criteria contained in EPA's

"Red Book," the 1976 version of Quality Criteria for Water. Since that time, the science regarding turbidity, settleable solids and suspended solids has improved greatly and the current criterion is no longer appropriate.

The EPA's Biocriteria Program is currently in the process of compiling up-to-date information on the science associated with turbidity, suspended sediments and bedded sediments. This is the first phase of the process of developing updated recommended criteria and is one of the Criteria and Standards Programs top priorities.

In light of the fact that this criterion is nearly 30 years old and is currently undergoing study for significant revision, we do not feel that it is appropriate to remove the current exemption for mining activities.

Comparison to Other States

As can be seen from Attachment I, West Virginia's criteria have historically remained very close to those of other states. It is not possible at this time to know whether other states contemplate the same aggressive approach being considered by the Board. This creates the risk of West Virginia's being in a position of competitive disadvantage with other states and produces an additional basis for slowing down this process.

Additional Trout Streams

The Board has added over 400 water bodies to the list of trout streams in the proposed standards. No information has been provided to verify whether all of the proposed streams meet the definition of trout stream under the WV Water Quality Standards (i.e. the stream supports trout year round and is not merely a stocked stream).

Conclusion

The Board's proposals contain numerous technical errors that need to be addressed before the standard should be approved. Attachment VI, **Summary Information**, provides a quick reference for these errors. In addition, much additional work needs to be done to assess which of the proposed criteria are required to be covered by West Virginia's water quality regulations to protect against adverse impact on designated uses of streams. In addition, it is premature to advance these proposed changes without having data that allow a comparison to be made to action of neighboring states. Accordingly, the Board should withdraw these proposals and propose them again only when a proper basis for the rules has been established.

Attachment I
Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria

Parameter Number	Parameter	CAS Number	Change versus current WV WQS	New Parameter (Y/N)	WQS	Use Designation							Below MDL	More Stringent than EPA
						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
1	Acenaphthene	83329	Yes	Yes	Proposed WV					670	990		No	No
1	Acenaphthene	83329	Yes	Yes	EPA					670	990		No	
2	Acrolein	107028	Yes	Yes	Proposed WV					190	290		No	No
2	Acrolein	107028	Yes	Yes	EPA					190	290		No	
3	Acrylonitrile	107131	Yes	No	Current WV					0.059	0.66		Yes	
3	Acrylonitrile	107131	Yes	No	Proposed WV					0.051	0.25		Yes	Yes
3	Acrylonitrile	107131	Yes	No	EPA					0.051	0.25		Yes	
4	Aldrin	309002	Yes	No	Current WV					0.071	0.07		Yes	
4	Aldrin	309002	Yes	No	Proposed WV	3.0		3.0		0.000049	0.000050		Yes	Yes
4	Aldrin	309002	Yes	No	EPA	3.0		3.0		0.000049	0.000050		Yes	
5	Aluminum (dissolved)	7429905	No	No	Current WV	750xCF	87xCF	750xCF	87xCF				No	
5	Aluminum (dissolved)	7429905	No	No	Proposed WV	750xCF	87xCF	750xCF	87xCF				No	No
5	Aluminum (dissolved)	7429905	No	No	PA	750xCF		750xCF					No	
5	Aluminum pH 6.5-9.0	7429905	No	No	EPA	750	87	750	87				No	
6	Ammonia	7664417	Yes	No	Current WV								No	
6	Ammonia	7664417	Yes	No	Proposed WV	See Footnote 1							No	No
6	Ammonia	7664417	Yes	No	EPA								No	
7	Anthracene	120127	Yes	Yes	Proposed WV					8,300	40000		No	Yes
7	Anthracene	120127	Yes	Yes	EPA					8,300	40000		No	
8	Antimony	7440360	Yes	No	Current WV					14	4300		Yes	
8	Antimony	7440360	Yes	No	Proposed WV					5.6	640		Yes	No
8	Antimony	7440360	Yes	No	EPA					5.6	640		Yes	
9.a	Arsenic	7440382	Yes	No	Current WV									
9.a	Arsenic	7440382	Yes	No	Proposed WV	340	150	340	150	50	50	100	0	
9.a	Arsenic (See Footnote 2)	7440382	Yes	No	EPA	340	150	340	150	10	10		0	No
9.b	Arsenic (dissolved trivalent)	7440382	No	No	Current WV	360xCF	190xCF	360xCF	190xCF	0.018	0.14			
9.b	Arsenic (dissolved trivalent)	7440382	No	No	Proposed WV	360xCF	190xCF	360xCF	190xCF				0	
10	Asbestos	1332214	Yes	Yes	Proposed WV								0	No
10	Asbestos	1332214	Yes	Yes	EPA					7 million fibers/L			0	No
11	Barium	7440393	No	No	Current WV					7 million fibers/L				
11	Barium	7440393	No	No	Proposed WV					1000			No	
11	Barium	7440393	No	No	EPA					1000			No	No
12	Benzene	71432	Yes	No	Current WV					1000			No	
										0.66	71		No	

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Parameter Number	Parameter	CAS Number	Change versus current WV WQS	New Parameter (Y/N)	WQS	Use Designation							Below MDL	More Stringent than EPA
						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
12	Benzene	71432	Yes	No	Proposed WV					2.2	51		No	Yes
12	Benzene	71432	Yes	No	EPA					2.2	51		No	
13	Benzidine	92875	Yes	Yes	Proposed WV					0.000086	0.00020		Yes	Yes
13	Benzidine	92875	Yes	Yes	EPA					0.000086	0.00020		Yes	
14	Benzo(a)anthrecene	56443	Yes	Yes	Proposed WV					0.0038	0.018		Yes	Yes
14	Benzo(a)anthrecene	56443	Yes	Yes	EPA					0.0038	0.018		Yes	
15	Benzo(a)Pyrene	50328	Yes	Yes	Proposed WV					0.0038	0.018		Yes	Yes
15	Benzo(a)Pyrene	50328	Yes	Yes	EPA					0.0038	0.018		Yes	
16	Benzo(b)Fluoranthene	205992	Yes	Yes	Proposed WV					0.0038	0.018		Yes	Yes
16	Benzo(b)Fluoranthene	205992	Yes	Yes	EPA					0.0038	0.018		Yes	
17	Benzo(k)Fluoranthene	207089	Yes	Yes	Proposed WV					0.0038	0.018		Yes	Yes
17	Benzo(k)Fluoranthene	207089	Yes	Yes	EPA					0.0038	0.018		Yes	
18	Beryllium	7440417	Yes	No	Current WV	130		130		0.0077			No	
18	Beryllium	7440417	Yes	No	Proposed WV					4			No	No
18	Beryllium	7440417	Yes	No	EPA					4			No	
19	alpha-BHC	319846	Yes	No	Proposed WV					0.0026	0.0049		Yes	Yes
19	alpha-BHC	319846	Yes	No	Current WV					0.0039	0.013		Yes	
19	alpha-BHC	319846	Yes	No	EPA					0.0026	0.0049		Yes	
20	beta-BHC	319851	Yes	No	Proposed WV					0.0091	0.017		No	Yes
20	beta-BHC	319851	Yes	No	Current WV					0.014	0.046		No	
20	beta-BHC	319851	Yes	No	EPA					0.0091	0.017		No	
21	gamma-BHC	58899	Yes	No	Proposed WV	0.95	0.08	0.95	0.08	0.019	0.063		No	Yes
21	gamma-BHC	58899	Yes	No	Current WV	2.0	0.08	2.0	0.08	0.019	0.063		No	
21	gamma-BHC	58899	Yes	No	EPA	0.95		0.95		0.019	0.063		No	
22	Bis(2-Chloroethyl)Ether	111444	Yes	Yes	Proposed WV					0.030	0.53		Yes	Yes
22	Bis(2-Chloroethyl)Ether	111444	Yes	Yes	EPA					0.030	0.53		Yes	
23	Bis(2-Chloroisopropyl) Ether	108601	Yes	Yes	Proposed WV					1,400	65000		No	Yes
23	Bis(2-Chloroisopropyl) Ether	108601	Yes	Yes	EPA					1,400	65000		No	
24	Bis(2-Ethylhexyl)Phthalate	117817	Yes	Yes	Proposed WV					1.2	2.2		Yes	Yes
24	Bis(2-Ethylhexyl)Phthalate	117817	Yes	Yes	EPA					1.2	2.2		Yes	
25	Bromoform	75252	Yes	Yes	Proposed WV					4.3	140		No	Yes

Attachment I

Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria

Parameter Number	Parameter	CAS Number	Change versus current WV WQS	New Parameter (Y/N)	WQS	Use Designation							Below MDL	More Stringent than EPA
						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
25	Bromoform	75252	Yes	Yes	EPA					4.3	140		No	
26	Butylbenzyl Phthalate	85687	Yes	Yes	Proposed WV					1,500	1900		Yes	No
26	Butylbenzyl Phthalate	85687	Yes	Yes	EPA					1,500	1900		Yes	
27.a	Cadmium	7440439	No	No	Proposed WV					see comment			Yes	No
27.a	Cadmium (See Footnote 3)	7440439	No	No	EPA	2.0	0.25	2.0	0.25	5			Yes	
27.b	Cadmium (dissolved), 4-day avg.	7440439	No	No	Current WV		$Cd=e^{(0.7852[ln(hardness)]-3.490)} \times CF$		$Cd=e^{(0.7852[ln(hardness)]-3.490)} \times CF$				Yes	
27.b	Cadmium (dissolved), 4-day avg.	7440439	No	No	Proposed WV		$Cd=e^{(0.7852[ln(hardness)]-3.490)} \times CF$		$Cd=e^{(0.7852[ln(hardness)]-3.490)} \times CF$				Yes	No
27.c	Cadmium (dissolved), 1-hour avg.	7440439	Yes	No	Current WV	$Cd=e^{(1.128[ln(hardness)]-3.828)} \times CF$		$Cd=e^{(1.128[ln(hardness)]-3.828)} \times CF$					Yes	
27.c	Cadmium (dissolved), 1-hour avg.	7440439	Yes	No	Proposed WV	$Cd=e^{(1.28[ln(hardness)]-3.828)} \times CF$		$Cd=e^{(1.28[ln(hardness)]-3.828)} \times CF$					Yes	No
27.c	Cadmium (dissolved), 1-hour avg.	7440439	Yes	No	OH	$Cd=e^{(1.128[ln(hardness)]-3.744)}$		$Cd=e^{(1.128[ln(hardness)]-3.744)}$					Yes	
28	Carbon Tetrachloride	56235	Yes	No	Current WV					0.25	4.4		No	
28	Carbon Tetrachloride	56235	Yes	No	Proposed WV					0.23	1.6		No	Yes
28	Carbon Tetrachloride	56235	Yes	No	EPA					0.23	1.6		No	
29	Chlordane	57749	Yes	No	Current WV	2.4	0.0043	2.4	0.0043	0.00046	0.00046	0.00046	Yes	
29	Chlordane	57749	Yes	No	Proposed WV	2.4	0.0043	2.4	0.0043	0.00080	0.00081		Yes	Yes
29	Chlordane	57749	Yes	No	EPA	2.4	0.0043	2.4	0.0043	0.00080	0.00081		Yes	
30	Chloride	16887006	No	No	Current WV	860,000	230,000	860,000	230,000	250,000	250000		No	
30	Chloride	16887006	No	No	Proposed WV	860,000	230,000	860,000	230,000	250,000	250000		No	No
30	Chloride	16887006	No	No	EPA	860,000	230,000	860,000	230,000				No	
31.a	Total Residual Chlorine	7782505	No	No	Current WV	19	11							
31.a	Total Residual Chlorine	7782505	No	No	Proposed WV	19	11							
31.a	Total Residual Chlorine	7782505	No	No	EPA	19	11							No

Attachment I
Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria

Parameter Number	Parameter	CAS Number	Change versus current WV WQS	New Parameter (Y/N)	WQS	Use Designation							Below MDL	More Stringent than EPA
						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
31.b	Total Residual Chlorine	7782505	Yes	No	Current WV			No chlorinated discharge allowed						
31.b	Total Residual Chlorine	7782505	Yes?	No	Proposed WV			No chlorinated discharge allowed	No chlorinated discharge allowed					
32	Chlorobenzene	108907	No	No	Current WV					680	21000		No	
32	Chlorobenzene	108907	No	No	Proposed WV					680	21000		No	Yes
32	Chlorobenzene	108907	No	No	EPA					680	21000		No	
33	Chlorodibromomethane	124481	Yes	Yes	Proposed WV					0.40	13		No	Yes
33	Chlorodibromomethane	124481	Yes	Yes	EPA					0.40	13		No	
34	Chloroform	67663	No	No	Current WV					5.7	470		No	
34	Chloroform	67663	No	No	Proposed WV					5.7	470		No	Yes
34	Chloroform	67663	No	No	EPA					5.7	470		No	
35	2-Chloronaphthalene	91587	Yes	Yes	Proposed WV					1,000	1600		No	No
35	2-Chloronaphthalene	91587	Yes	Yes	EPA					1,000	1600		No	
36	2-Chlorophenol	95578	Yes	No	Current WV					120	400		No	
36	2-Chlorophenol	95578	Yes	No	Proposed WV					81	150		No	No
36	2-Chlorophenol	95578	Yes	No	EPA					81	150		No	
37	Chlorophenoxy Herbicide (2,4-D)	94757	Yes	Yes	Proposed WV					100			No	No
37	Chlorophenoxy Herbicide (2,4-D)	94757	Yes	Yes	EPA					100			No	
38	Chlorophenoxy Herbicide (2,4,5-TP)	93721	Yes	Yes	EPA					10			No	
38	Chlorophenoxy Herbicide (2,4,5-TP)	93721	Yes	Yes	Proposed WV					10			No	
39	Chloropyrifos	2921882	Yes	Yes	Proposed WV	0.083	0.041	0.083	0.041				Yes	No
39	Chloropyrifos	2921882	Yes	Yes	EPA	0.083	0.041	0.083	0.041				Yes	
40.a	Chromium III (See Footnote 4)	16065831		No	EPA	570	74	570	74	100 (total)				
40.a	Chromium III, 1-hour avg.	16065831	No	No	Current WV	$e^{(0.8190[\ln(\text{hardness})]+3.7256)}$ x CF		$e^{(0.8190[\ln(\text{hardness})]+3.7256)}$ x CF						

Attachment I
Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria

Parameter Number	Parameter	CAS Number	Change versus current WV WQS	New Parameter (Y/N)	WQS	Use Designation								
						Aquatic Life				Human Health		All Other Uses	Below MDL	More Stringent than EPA
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
40.a	Chromium III, 1-hour avg.	16065831	No	No	Proposed WV	$e^{(0.8190[\ln(\text{hardness})]+3.7256)}$ x CF		$e^{(0.8190[\ln(\text{hardness})]+3.7256)}$ x CF						No
40.b	Chromium III, 4-day avg.	16065831	No	No	Current WV		$e^{(0.8190[\ln(\text{hardness})]+0.6848)}$ x CF		$e^{(0.8190[\ln(\text{hardness})]+0.6848)}$ x CF					
40.b	Chromium III, 4-day avg.	16065831	No	No	Proposed WV		$e^{(0.8190[\ln(\text{hardness})]+0.6848)}$ x CF		$e^{(0.8190[\ln(\text{hardness})]+0.6848)}$ x CF					No
41	Chromium VI (dissolved)	18540299	No	No	Current WV	16 x CF	11 x CF	16 x CF	7.2 x CF	50			No	
41	Chromium VI (dissolved)	18540299	No	No	Proposed WV	16 x CF	11 x CF	16 x CF	7.2 x CF	50			No	No
41	Chromium VI (dissolved) (See Footnote 5)	18540299	No	No	EPA	16	11	16	11	100 (total)			No	
42	Chrysene	218019	Yes	Yes	Proposed WV					0.0038	0.018		Yes	Yes
42	Chrysene	218019	Yes	Yes	EPA					0.0038	0.018		Yes	
43.a	Copper	7440508	Yes	No	Current WV					1000			No	
43.a	Copper	7440508	Yes	No	Proposed WV	13	9.0	13	9.0	1300			No	Yes
43.a	Copper (See Footnote 6)	7440508	Yes	No	EPA	13	9.0	13	9.0	1300			No	
43.b	Copper, 4-day avg.	7440508	No	No	Current WV		$e^{(0.8545[\ln(\text{hardness})]-1.465)}$ x CF		$e^{(0.8545[\ln(\text{hardness})]-1.465)}$ x CF				No	
43.b	Copper, 4-day avg.	7440508	No	No	Proposed WV		$e^{(0.8545[\ln(\text{hardness})]-1.465)}$ x CF		$e^{(0.8545[\ln(\text{hardness})]-1.465)}$ x CF				No	No
43.c	Copper, 1-hour avg.	7440508	No	No	Current WV	$e^{(0.9422[\ln(\text{hardness})]-1.464)}$ x CF		$e^{(0.9422[\ln(\text{hardness})]-1.464)}$ x CF					No	
43.c	Copper, 1-hour avg.	7440508	No	No	Proposed WV	$e^{(0.9422[\ln(\text{hardness})]-1.464)}$ x CF		$e^{(0.9422[\ln(\text{hardness})]-1.464)}$ x CF					No	No
43.c	Copper, 1-hour avg.	7440508	No	No	OH	$e^{(0.9422[\ln(\text{hardness})]-1.700)}$ x CF		$e^{(0.9422[\ln(\text{hardness})]-1.700)}$ x CF					No	

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						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
44	Cyanide	57125	No	No	Current WV	22	5.0	22	5.0	5.0	5.00		No	
44	Cyanide	57125	No	No	Proposed WV	22	5.0	22	5.0	5.0	5.00		No	No
44	Cyanide	57125	No	No	EPA	22	5.2	22	5.2	700	220000		No	
45	4,4'-DDD	72548	Yes	Yes	Proposed WV					0.00031	0.00031		Yes	Yes
45	4,4'-DDD	72548	Yes	Yes	EPA					0.00031	0.00031		Yes	
46	4,4'-DDE	72559	Yes	Yes	Proposed WV					0.00022	0.00022		Yes	Yes
46	4,4'-DDE	72559	Yes	Yes	EPA					0.00022	0.00022		Yes	
47	4,4'-DDT	50293	Yes	No	Current WV	1.1	0.001	1.1	0.001	0.000024	0.000024	0.000024	Yes	
47	4,4'-DDT	50293	Yes	No	Proposed WV	1.1	0.001	1.1	0.001	0.00022	0.00022		Yes	Yes
47	4,4'-DDT	50293	Yes	No	EPA	1.1	0.001	1.1	0.001	0.00022	0.00022		Yes	
48	Demeton	8065483	Yes	Yes	Proposed WV		0.1							No
48	Demeton	8065483	Yes	Yes	EPA		0.1							
49	Dibenzo(a,h)Anthracene	53703	Yes	Yes	Proposed WV					0.0038	0.018		Yes	Yes
49	Dibenzo(a,h)Anthracene	53703	Yes	Yes	EPA					0.0038	0.018		Yes	
50	1,2-Dichlorobenzene	95501	No	No	Current WV					2,700	17000		No	
50	1,2-Dichlorobenzene	95501	No	No	Proposed WV					2,700	17000		No	No
50	1,2-Dichlorobenzene	95501	No	No	EPA					2,700	17000		No	
51	1,3-Dichlorobenzene	541731	Yes	No	Current WV					400	2600		No	
51	1,3-Dichlorobenzene	541731	Yes	No	Proposed WV					320	960		No	No
51	1,3-Dichlorobenzene	541731	Yes	No	EPA					320	960		No	
52	1,4-Dichlorobenzene	106467	No	No	Current WV					400	2600		No	
52	1,4-Dichlorobenzene	106467	No	No	Proposed WV					400	2600		No	No
52	1,4-Dichlorobenzene	106467	No	No	EPA					75	2600		No	
53	3,3'-Dichlorobenzidine	91941	Yes	Yes	Proposed WV					0.021	0.028		Yes	Yes
53	3,3'-Dichlorobenzidine	91941	Yes	Yes	EPA					0.021	0.028		Yes	
54	Dichlorobromomethane	75274	Yes	Yes	Proposed WV					0.55	17		Yes	Yes
54	Dichlorobromomethane	75274	Yes	Yes	EPA					0.55	17		Yes	
55	1,2-Dichloroethane	107062	Yes	No	Current WV					0.035	99		Yes	
55	1,2-Dichloroethane	107062	Yes	No	Proposed WV					0.38	37		Yes	Yes
55	1,2-Dichloroethane	107062	Yes	No	EPA					0.38	37		Yes	
56	1,1-Dichloroethylene	75354	No	No	Current WV					0.03	3.2		Yes	
56	1,1-Dichloroethylene	75354	No	No	Proposed WV					0.03	3.2		Yes	Yes
56	1,1-Dichloroethylene	75354	No	No	EPA					0.057	3.2		Yes	
57	2,4-Dichlorophenol	120832	Yes	No	Current WV					93	790		No	
57	2,4-Dichlorophenol	120832	Yes	No	Proposed WV					77	290		No	No

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						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
57	2,4-Dichlorophenol	120832	Yes	No	EPA					77	290		No	
58	1,2-Dichloropropane	78875	Yes	Yes	Proposed WV					0.50	15		No	Yes
58	1,2-Dichloropropane	78875	Yes	Yes	EPA					0.50	15		No	
59	1,3-Dichloropropene	542756	Yes	Yes	Proposed WV					10	1700		No	Yes
59	1,3-Dichloropropene	542756	Yes	Yes	EPA					10	1700		No	
60	Dieldrin	60571	Yes	No	Current WV	2.5	0.0019	2.5	0.0019	0.000071	0.000071	0.071	Yes	
60	Dieldrin	60571	Yes	No	Proposed WV	0.24	0.056	0.24	0.056	0.000052	0.000054		Yes	Yes
60	Dieldrin	60571	Yes	No	EPA	0.24	0.056	0.24	0.056	0.000052	0.000054		Yes	
61	Diethyl Phthalate	84662	Yes	Yes	Proposed WV					17,000	44000		No	No
61	Diethyl Phthalate	84662	Yes	Yes	EPA					17,000	44000		No	
62	2,4-Dimethylphenol	105679	Yes	No	Current WV					540	2300		No	
62	2,4-Dimethylphenol	105679	Yes	No	Proposed WV					380	850		No	No
62	2,4-Dimethylphenol	105679	Yes	No	EPA					380	850		No	
63	Dimethyl Phthalate	131113	Yes	Yes	Proposed WV					270,000	1100000		No	No
63	Dimethyl Phthalate	131113	Yes	Yes	EPA					270,000	1100000		No	
64	Di-n-Butyl Phthalate	84742	Yes	Yes	Proposed WV					2,000	4500		No	Yes
64	Di-n-Butyl Phthalate	84742	Yes	Yes	EPA					2,000	4500		No	
65	2,4-Dinitrophenol	51285	Yes	No	Current WV					70	14000		No	
65	2,4-Dinitrophenol	51285	Yes	No	Proposed WV					69	5300		No	No
65	2,4-Dinitrophenol	51285	Yes	No	EPA					69	5300		No	
66	Dinitrophenols	25550587	Yes	No	Current WV					70	14000		No	
66	Dinitrophenols	25550587	Yes	No	Proposed WV					69	5300		No	No
66	Dinitrophenols	25550587	Yes	No	EPA					69	5300		No	
67	2,4-Dinitrotoluene	121142	Yes	No	Current WV					0.11	9.10		No	
67	2,4-Dinitrotoluene	121142	Yes	No	Proposed WV					0.11	3.4		No	Yes
67	2,4-Dinitrotoluene	121142	Yes	No	EPA					0.11	3.4		No	
68	1,2-Diphenylhydrazine	122667	Yes	Yes	Proposed WV					0.036	0.20		Yes	Yes
68	1,2-Diphenylhydrazine	122667	Yes	Yes	EPA					0.036	0.20		Yes	
69	alpha-Endosulfan	959988	Yes	Yes	Proposed WV	0.22	0.056	0.22	0.056	62	89		No	No
69	alpha-Endosulfan	959988	Yes	Yes	EPA	0.22	0.056	0.22	0.056	62	89		No	
70	beta-Endosulfan	33213659	Yes	Yes	Proposed WV	0.22	0.056	0.22	0.056	62	89		No	No
70	beta-Endosulfan	33213659	Yes	Yes	EPA	0.22	0.056	0.22	0.056	62	89		No	
71	Endosulfan Sulfate	1031078	Yes	Yes	Proposed WV					62	89		No	No
71	Endosulfan Sulfate	1031078	Yes	Yes	EPA					62	89		No	
72	Endrin	72208	Yes	No	Current WV	0.180	0.0023	0.180	0.0023	0.0023	0.002	0.0023	No	
72	Endrin	72208	Yes	No	Proposed WV	0.086	0.036	0.086	0.036	0.76	0.81		No	No

Attachment I
Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria

Parameter Number	Parameter	CAS Number	Change versus current WV WQS	New Parameter (Y/N)	WQS	Use Designation							Below MDL	More Stringent than EPA
						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
72	Endrin	72208	Yes	No	EPA	0.086	0.036	0.086	0.036	0.76	0.81		No	
73	Endrin Aldehyde	7421934	Yes	Yes	Proposed WV					0.29	0.30		No	No
73	Endrin Aldehyde	7421934	Yes	Yes	EPA					0.29	0.30		No	
74	Ether Bis(Chloromethyl)	542881	Yes	Yes	Proposed WV					0.00010	0.00029		Yes	Yes
74	Ether Bis(Chloromethyl)	542881	Yes	Yes	EPA					0.00010	0.00029		Yes	
75	Ethylbenzene	100414	No	No	Current WV					3,100	29000		Yes	
75	Ethylbenzene	100414	No	No	Proposed WV					3,100	29000		Yes	No
75	Ethylbenzene	100414	No	No	EPA					3,100	29000		Yes	
76.a	Fecal Coliform			No	Current WV								NA	
76.a	Fecal Coliform			No	Proposed WV								NA	
76.b	Fecal Coliform - Ohio River			No	Current WV								NA	
76.b	Fecal Coliform - Ohio River			No	Proposed WV								NA	
77	Fluoranthene	206440	Yes	No	Current WV					300	370		No	
77	Fluoranthene	206440	Yes	No	Proposed WV					130	140		No	No
77	Fluoranthene	206440	Yes	No	EPA					130	140		No	
78	Fluorene	86737	Yes	Yes	Proposed WV					1,100	5300		No	No
78	Fluorene	86737	Yes	Yes	EPA					1,100	5300		No	
79	Fluoride	7782414	Yes	No	Current WV					1400			No	
79	Fluoride	7782414	Yes	No	Proposed WV					1400		2 for Cat. I	No	No
80	Guthion	86500	Yes	Yes	Proposed WV		0.01						Yes	No
80	Guthion	86500	Yes	Yes	EPA		0.01						Yes	
81	Halomethanes		No	No	Current WV					0.19	15.7			
81	Halomethanes		No	No	Proposed WV					0.19	15.7			No
82	Heptachlor	76448	Yes	No	Current WV	0.52	0.0038	0.52	0.0038	0.21	0.00021		Yes	
82	Heptachlor	76448	Yes	No	Proposed WV	0.52	0.0038	0.52	0.0038	0.000079	0.000079		Yes	Yes
82	Heptachlor	76448	Yes	No	EPA	0.52	0.0038	0.52	0.0038	0.000079	0.000079		Yes	
83	Heptachlor Epoxide	1024573	Yes	Yes	Proposed WV	0.52	0.0038	0.52	0.0038	0.000039	0.000039		Yes	Yes
83	Heptachlor Epoxide	1024573	Yes	Yes	EPA	0.52	0.0038	0.52	0.0038	0.000039	0.000039		Yes	
84	Hexachlorobenzene	118741	Yes	No	Current WV					0.72	0.77		Yes	
84	Hexachlorobenzene	118741	Yes	No	Proposed WV					0.00028	0.00029		Yes	Yes
84	Hexachlorobenzene	118741	Yes	No	EPA					0.00028	0.00029		Yes	
85	Hexachlorobutadiene	87683	Yes	Yes	Proposed WV					0.44	18		Yes	Yes
85	Hexachlorobutadiene	87683	Yes	Yes	EPA					0.44	18		Yes	

Attachment I
Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria

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						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
86	Hexachlorocyclo-hexane-Technical	319868	Yes	Yes	Proposed WV					0.0123	0.0414		No	Yes
86	Hexachlorocyclo-hexane-Technical	319868	Yes	Yes	EPA					0.0123	0.0414		No	
87	Hexachlorocyclo-pentadiene	77474	Yes	Yes	Proposed WV					240	17000		No	No
87	Hexachlorocyclo-pentadiene	77474	Yes	Yes	EPA					240	17000		No	
88	Hexachloroethane	67721	Yes	Yes	Proposed WV					1.4	3.3		n	Yes
88	Hexachloroethane	67721	Yes	Yes	EPA					1.4	3.3		n	
89	Ideno(1,2,3-cd)Pyrene	193395	Yes	Yes	Proposed WV					0.0038	0.018		Yes	Yes
89	Ideno(1,2,3-cd)Pyrene	193395	Yes	Yes	EPA					0.0038	0.018		Yes	
90	Iron	7439896	No	No	Current WV		1500		500	1500			No	
90	Iron	7439896	No	No	Proposed WV		1500		500	1500			No	No
90	Iron	7439896	No	No	EPA		1000		1000	300			No	
91	Isophorone	78591	Yes	Yes	Proposed WV					35	960		No	Yes
91	Isophorone	78591	Yes	Yes	EPA					35	960		No	
92.a	Lead	7439921	Yes	No	Proposed WV					15	15		No	No
92.a	Lead	7439921	Yes	No	Current WV					50			No	
92.a	Lead (See Footnote 7)	7439921	Yes	No	EPA	65	2.5	65	2.5	15			No	
92.b	Lead (4 day dissolved lead)	7439921	No	No	Current WV		$e^{(1.273[\ln(hardness)]-4.705)}xCF$		$e^{(1.273[\ln(hardness)]-4.705)}xCF$				No	
92.b	Lead (4 day dissolved lead)	7439921	No	No	Proposed WV		$e^{(1.273[\ln(hardness)]-4.705)}xCF$		$e^{(1.273[\ln(hardness)]-4.705)}xCF$				No	No
92.c	Lead (one hour average dissolved lead)	7439921	No	No	Current WV	$e^{(1.273[\ln(hardness)]-1.46)}xCF$		$e^{(1.273[\ln(hardness)]-1.46)}xCF$					No	
92.c	Lead (one hour average dissolved lead)	7439921	No	No	Proposed WV	$e^{(1.273[\ln(hardness)]-1.46)}xCF$		$e^{(1.273[\ln(hardness)]-1.46)}xCF$					No	No
92.c	Lead (one hour average dissolved lead)	7439921	No	No	Proposed WV	$e^{(1.273[\ln(hardness)]-1.055)}xCF$		$e^{(1.273[\ln(hardness)]-1.055)}xCF$					No	No
93	Malathion	121755	Yes	Yes	Proposed WV		0.1						Yes	No
93	Malathion	121755	Yes	Yes	EPA		0.1						Yes	

Attachment I
Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria

Parameter Number	Parameter	CAS Number	Change versus current WV WQS	New Parameter (Y/N)	WQS	Use Designation							Below MDL	More Stringent than EPA
						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
94	Manganese		No	No	Current WV					1000			No	
94	Manganese		No	No	Proposed WV					1000			No	No
94	Manganese		No	No	EPA					50			No	
95.a	Mercury - dissolved	7439976	Yes	Yes	Current WV	1.4	0.77	1.4	0.77					
95.a	Mercury - dissolved	7439976	Yes	Yes	EPA	1.4	0.77	1.4	0.77					
95.b	Mercury (total unfiltered)	7439976	Yes	No	Current WV	2.4		2.4		0.14	0.15			
95.b	Mercury (total unfiltered)	7439976	Yes	No	Proposed WV					0.14	0.15			No
95.c	Mercury (body burden)	7439976	No	No	Current WV					0.5	0.50			
95.c	Mercury (body burden)	7439976	No	No	Proposed WV					0.5	0.50			No
96	Methoxychlor	72435	Yes	Yes	Proposed WV		0.03		0.03	0.03	0.03		Yes	No
96	Methoxychlor	72435		No	Current WV		0.03		0.03	0.03	0.03	0.03	Yes	
96	Methoxychlor	72435		No	EPA		0.03		0.03	100			Yes	
97	Methyl Bromide	74839	Yes	Yes	Proposed WV					47	1500		No	No
97	Methyl Bromide	74839	Yes	Yes	EPA					47	1500		No	
98	Methylene Chloride	75092	Yes	Yes	Proposed WV					4.6	590		No	Yes
98	Methylene Chloride	75092	Yes	Yes	EPA					4.6	590		No	
99	2-Methyl-4,6-Dinitrophenol	534521	Yes	Yes	Proposed WV					13	280		Yes	No
99	2-methyl 4.6-Dinitrophenol			No	Current WV					13.4	765		Yes	
99	2-Methyl-4,6-Dinitrophenol	534521	Yes	Yes	EPA					13	280		Yes	
100	Mirex	2385855	Yes	Yes	Proposed WV		0.001		0.001				Yes	No
100	Mirex	2385855	Yes	Yes	EPA		0.001		0.001				Yes	
101.a	Nickel	7440020	Yes	No	Current WV					510	4600		No	
101.a	Nickel	7440020	Yes	No	Proposed WV	470	52	470	52	610	4600		No	No
101.a	Nickel (See Footnote 8)	7440020	Yes	No	EPA	470	52	470	52	610	4600		No	
101.b	Nickel (4 day average)	7440020	No	No	Current WV		$e^{(.846[\ln(\text{hardness})]+1.1645)}$ xCF		$e^{(.846[\ln(\text{hardness})]+1.1645)}$ xCF				No	
101.b	Nickel (4 day average)	7440020	No	No	Proposed WV		$e^{(.846[\ln(\text{hardness})]+1.1645)}$ xCF		$e^{(.846[\ln(\text{hardness})]+1.1645)}$ xCF				No	No

Attachment I
Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria

Parameter Number	Parameter	CAS Number	Change versus current WV WQS	New Parameter (Y/N)	WQS	Use Designation							Below MDL	More Stringent than EPA
						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
101.b	Nickel (4 day average)	7440020	No	No	OH		$e^{(.846[\ln(hardness)]+0.0584)}$		$e^{(.846[\ln(hardness)]+0.0584)}$				No	
101.c	Nickel (one hour average)	7440020	No	No	Current WV	$e^{(.846[\ln(hardness)]+3.361)}xCF$		$e^{(.846[\ln(hardness)]+3.361)}xCF$					No	
101.c	Nickel (one hour average)	7440020	No	No	Proposed WV	$e^{(.846[\ln(hardness)]+3.361)}xCF$		$e^{(.846[\ln(hardness)]+3.361)}xCF$					No	No
101.c	Nickel (one hour average)	7440020	No	No	OH	$e^{(.846[\ln(hardness)]+2.255)}$		$e^{(.846[\ln(hardness)]+2.255)}$					No	
102	Nitrate (as Nitrate N)	14797558	No	No	Current WV					10000			No	
102	Nitrate (as Nitrate N)	14797558	No	No	Proposed WV					10000			No	No
102	Nitrates	14797558	No	No	EPA					10000			No	
103	Nitrobenzene	98953	Yes	Yes	Proposed WV					17	690		No	No
103	Nitrobenzene	98953	Yes	Yes	EPA					17	690		No	
104	Nitrosamines		Yes	Yes	Proposed WV					0.0008	1.24		0	No
104	Nitrosamines		Yes	Yes	EPA					0.0008	1.24			
105	Nitrosodibutylamine, N	924163	Yes	Yes	Proposed WV					0.0063	0.22		0	Yes
105	Nitrosodibutylamine, N	924163	Yes	Yes	EPA					0.0063	0.22			
106	Nitrosodiethylamine, N	55185	Yes	Yes	Proposed WV					0.0008	1.24		Yes	Yes
106	Nitrosodiethylamine, N	55185	Yes	Yes	EPA					0.0008	1.24		Yes	
107	N-Nitrosodimethylamine	62759	Yes	Yes	Proposed WV					0.00069	3.0		Yes	Yes
107	N-Nitrosodimethylamine	62759	Yes	Yes	EPA					0.00069	3.0		Yes	
108	N-Nitrosodi-n-Propylamine	621647	Yes	Yes	Proposed WV					0.0050	0.51		Yes	Yes
108	N-Nitrosodi-n-Propylamine	621647	Yes	Yes	EPA					0.0050	0.51		Yes	
109	N-Nitrosodiphenylamine	86306	Yes	Yes	Proposed WV					3.3	6.0		No	Yes
109	N-Nitrosodiphenylamine	86306	Yes	Yes	EPA					3.3	6.0		No	
110	Nitrosopyrrolidine, N	930552	Yes	Yes	Proposed WV					0.016	34		Yes	Yes
110	Nitrosopyrrolidine, N	930552	Yes	Yes	EPA					0.016	34		Yes	
111	Threshold odor		No	No	Current WV		8		8	8	8.00		NAP	
111	Threshold odor		No	No	Proposed WV		8		8	8	8.00		NAP	No
113	Parathion	56382	Yes	Yes	Proposed WV	0.065	0.013	0.065	0.013				Yes	No
113	Parathion	56382	Yes	Yes	EPA	0.065	0.013	0.065	0.013				Yes	

Attachment I
Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria

Parameter Number	Parameter	CAS Number	Change versus current WV WQS	New Parameter (Y/N)	WQS	Use Designation							Below MDL	More Stringent than EPA
						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
114	Pentachlorobenzene	608935	Yes	Yes	Proposed WV					1.4	1.5		Yes	No
114	Pentachlorobenzene	608935	Yes	Yes	EPA					1.4	1.5		Yes	
115	Pentachlorophenol	87865	Yes	No	Current WV					0.28	8.2		Yes	
115	Pentachlorophenol	87865	Yes	No	Proposed WV	19	15	19	15	0.27	3.0		Yes	Yes
115	Pentachlorophenol (one hour average)			No	Current WV	e[illegible] 4.869)		e[illegible] 4.869)					Yes	
115	Pentachlorophenol (4 day average)			No	Current WV		e^(1.005(pH)-5.134)		e^(1.005(pH)-5.134)				Yes	
115	Pentachlorophenol (See Footnote 9)	87865	Yes	No	EPA	19	15	19	15	0.27	3.0		Yes	
116	pH		Yes	no	Current WV	6 to 9	6 to 9	6 to 9	6 to 9	6 to 9	6 to 9	6 to 9	NAP	
116	pH		Yes	no	Proposed WV	6 to 9	6 to 9	6 to 9	6 to 9	5 to 9	6 to 9	6 to 9	NAP	No
116	pH		Yes	no	EPA		6.5 to 9		6.5 to 9		6 to 9	5 to 9	NAP	
117	Phenol	108952	Yes	No	Current WV					21000	4,600,000		No	
117	Phenol	108952	Yes	No	Proposed WV					21000	1,700,000		No	No
117	Phenol	108952	Yes	No	EPA					21000	1,700,000		No	
118	Phthalate esters		No	No	Current WV		3		3				Yes	
118	Phthalate esters		No	No	Proposed WV		3		3				Yes	No
119	PCB	1336363	No	No	Current WV		0.014		0.014	0.000044	0.000045	0.045	Yes	
119	PCB	1336363	No	No	Proposed WV		0.014		0.014	0.000044	0.000045	0.045 ?	Yes	Yes
119	PCB	1336363	No	No	EPA		0.014		0.014	0.000064	0.000064	0.045	Yes	
120	Polynuclear Aromatic Hydrocarbons (PAH)		No	No	Current WV					0.0028	0.031		Yes	
120	Polynuclear Aromatic Hydrocarbons (PAH)		No	No	Proposed WV					0.0028	0.031		Yes	Yes
121	Pyrene	129000	Yes	Yes	Proposed WV					830	4000		No	No
121	Pyrene	129000	Yes	Yes	EPA					830	4000		No	
122.a	Radionuclides			Yes	Proposed WV	See Written Comments								Yes
122.a.1	Beta particle and photon activity (formerly man-made radionuclides)			No	Proposed WV					4	4			
122.a.2	Gross alpha particle activity				Proposed WV					15	15			
122.a.3	Combined Radium 226 and 228 Radon				Proposed WV					300	300			

Attachment I
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						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
122.a.4	Uranium				Proposed WV					20	20			
123.b.1	Gross alpha particle activity excluding radon and uranium) - Ohio River Main stem			Yes	Proposed WV					15	15			
123.b.2	Combined Radium 226 and 228 Radon - Ohio River Main Stem			Yes	Proposed WV					4	4			
123.b.3	Beta particle and photon activity (formerly man-made radionuclides) - Ohio River Main Stem			No	Proposed WV					50	50			
123.b.4	Total strontium-90 - Ohio River Main Stem			No	Proposed WV					8	8			
124	Selenium	7782492	Yes	No	Current WV	20	5	20	5	10			No	
124	Selenium	7782492	Yes	No	Proposed WV	20	5.0	20	5.0	50	4200		No	Yes
124	Selenium (See Footnote 10)	7782492	Yes	No	EPA		5.0		5.0	50	4200		No	
125.a	Silver	7440224		No	Current WV								No	
125.a	Silver	7440224		No	Current WV								No	
125.a	Silver	7440224		No	Proposed WV								No	No
125.a	Silver (See Footnote 11)	7440224		No	EPA								No	
125.b	Silver (chronic)	7440224		No	Proposed WV								No	No
125.c	Silver (one hour average)	7440224	No	No	Current WV	$e^{(1.72[\ln(\text{hardness})]-6.52)}$xCF		$e^{(1.72[\ln(\text{hardness})]-6.52)}$xCF					No	
125.c	Silver (one hour average)	7440224	No	No	Proposed WV	$e^{(1.72[\ln(\text{hardness})]-6.52)}$xCF		$e^{(1.72[\ln(\text{hardness})]-6.52)}$xCF					No	No
126	Solids Dissolved and Salinity		Yes	Yes	Proposed WV					250000			0	No
126	Solids Dissolved and Salinity		Yes	Yes	EPA					250000				
127	Sulfide - Hydrogen Sulfide	7783064	Yes	Yes	Proposed WV		2.0		2.0				0	No
127	Sulfide - Hydrogen Sulfide	7783064	Yes	Yes	EPA		2.0		2.0					
128	2,3,7,8 - TCDD (dioxin)	1746016	Yes	No	Proposed WV					5.0E-09	5.1E-09		Yes	Yes
128	2,3,7,8 - TCDD (dioxin)	1746016	Yes	No	EPA					5.0E-09	5.1E-09		Yes	

Attachment I
Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria

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						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
128	Dioxin (2,3,7,8-TCDD)	1746016	Yes	No	Current WV					1.30E-08	1.40E-08	1.40E-08	Yes	
129.a	Temperature			No	Proposed WV								NAP	No
129.a	Temperature			No	EPA								NAP	
130	Tetrachlorobenzene, 1,2,4,5	95943	Yes	Yes	Proposed WV					0.97	1.1		Yes	No
130	Tetrachlorobenzene, 1,2,4,5	95943	Yes	Yes	EPA					0.97	1.1		Yes	
131	1,1,2,2-tetrachloroethane	79345	Yes	No	Current WV					0.17	11		No	
131	1,1,2,2-tetrachloroethane	79345	Yes	No	Proposed WV					0.69	3.3		No	Yes
131	1,1,2,2-tetrachloroethane	79345	Yes	No	EPA					0.17	4.0		No	
132	Tetrachloroethylene	127184	Yes	No	Current WV					0.8	8.85		No	
132	Tetrachloroethylene	127184	Yes	No	Proposed WV					0.69	3.3		No	Yes
132	Tetrachloroethylene	127184	Yes	No	EPA					0.69	3.3		No	
133	Thallium	7440280	No	No	Current WV					1.7	6.3		No	
133	Thallium	7440280	No	No	Proposed WV					1.7	6.3		No	No
133	Thallium	7440280	No	No	EPA					1.7	6.3		No	
134	Toluene	108883	No	No	Current WV					6800	200000		No	
134	Toluene	108883	No	No	Proposed WV					6800	200000		No	No
134	Toluene	108883	No	No	EPA					6800	200000		No	
135	Toxaphene	8001352	Yes	No	Current WV	0.73	0.0002	0.73	0.0002	0.00073	0.00073	0.00073	Yes	
135	Toxaphene	8001352	Yes	No	Proposed WV	0.73	0.0002	0.73	0.0002	0.00028	0.00028		Yes	Yes
135	Toxaphene	8001352	Yes	No	EPA	0.73	0.0002	0.73	0.0002	0.00028	0.00028		Yes	
136	1,2-Trans-Dichloroethylene	156605	Yes	Yes	Proposed WV					700	140000		No	No
136	1,2-Trans-Dichloroethylene	156605	Yes	Yes	EPA					700	140000		No	
137	Tributyltin (TBT)		Yes	Yes	Proposed WV	0.46	0.063						0	No
137	Tributyltin (TBT)		Yes	Yes	EPA	0.46	0.063	0.46	0.063					
138	1,2,4-Trichlorobenzene	120821	Yes	Yes	Proposed WV					260	940		No	No
138	1,2,4-Trichlorobenzene	120821	Yes	Yes	EPA					260	940		No	
139	1,1,1-trichloroethane	71556	No	No	Current WV					12000			No	
139	1,1,1-trichloroethane	71556	No	No	Proposed WV					12000			No	Yes
139	1,1,1-trichloroethane	71556	No	No	EPA					200			No	
140	1,1,2-trichloroethane	79005	Yes	Yes	Proposed WV					0.59	16		No	Yes

Attachment I
Comparison of EQB Proposal to Existing Criteria and EPA Recommended Criteria

Parameter Number	Parameter	CAS Number	Change versus current WV WQS	New Parameter (Y/N)	WQS	Use Designation							Below MDL	More Stringent than EPA
						Aquatic Life				Human Health		All Other Uses		
						B1,B4		B2						
						Acute	Chronic	Acute	Chronic	A	C			
140	1,1,2-trichloroethane	79005	Yes	Yes	EPA					0.59	16		No	
141	Trichloroethylene	79016	Yes	No	Current WV					2.7	81		No	
141	Trichloroethylene	79016	Yes	No	Proposed WV					2.5	30		No	Yes
141	Trichloroethylene	79016	Yes	No	EPA					2.5	30		No	
142	Trichlorophenol, 2,4,5-	95954	Yes	Yes	Proposed WV					1800	3600		No	No
142	Trichlorophenol, 2,4,5-	95954	Yes	Yes	EPA					1800	3600		No	
143	2,4,6-Trichlorophenol	88062	Yes	No	Current WV					2.1	6.50		No	
143	2,4,6-Trichlorophenol	88062	Yes	No	Proposed WV					1.4	2.4		No	Yes
143	2,4,6-Trichlorophenol	88062	Yes	No	EPA					1.4	2.4		No	
144.a	Turbidity			No	Proposed WV								NAP	
144.b	Turbidity			No	Proposed WV								NAP	
144.c	Turbidity			No	Proposed WV								NAP	
145	Vinyl chloride	75014	No	No	Current WV					2	525		No	
145	Vinyl chloride	75014	No	No	Proposed WV					2	525		No	Yes
145	Vinyl chloride	75014	No	No	EPA					2.0	530		No	
146.a	Zinc (4 day average)	7440666	No	No	Current WV		$e^{(0.8473[\ln(\text{hardness})]+0.7614)} \times CF$		$e^{(0.8473[\ln(\text{hardness})]+0.7614)} \times CF$				No	
146.a	Zinc (4 day average)	7440666	No	No	Proposed WV		$e^{(0.8473[\ln(\text{hardness})]+0.7614)} \times CF$		$e^{(0.8473[\ln(\text{hardness})]+0.7614)} \times CF$				No	No
146.a	Zinc (4 day average) (See Footnote 12)	7440666	No	No	EPA		120		120				No	No
146.b	Zinc (1 hour average)	7440666	No	No	Current WV	$e^{(0.8473[\ln(\text{hardness})]+0.8604)} \times CF$		$e^{(0.8473[\ln(\text{hardness})]+0.8604)} \times CF$					No	
146.b	Zinc (1 hour average) (See Footnote 12)	7440666	No	No	EPA	120		120					No	
146.b	Zinc (1 hour average)	7440666	No	No	Proposed WV	120		120					No	No

Legend
Blue - New Parameter
Red - Change from existing standard
Green - EPA Safe Drinking Water Criteria

Attachment II
Method Detection Limit Information

Parameter Number	Parameter	Approved Analytical Method	Lowest Proposed Standard (µg/L)	Method Detection Limit µg/L	DEP Action Level µg/L
1	Acenaphthene	610 - HPLC: 1.8 ug/L	670	10	31.8
2	Acrolein	603 - GC/FID: 0.7 ug/L	190	0.7	2.226
3	Acrylonitrile	603 - GC/FID: 0.5 ug/L	0.051	0.5	1.59
4	Aldrin	608 - GC/ECD: 0.004 ug/L	0.000049	0.004	0.01272
5	Aluminum (dissolved)	202.2 - AA furnace: 3 ug/L	87	3	9.54
6	Ammonia	349.0 - Colorimetric: 0.3 ug/L	897	0.3	0.954
7	Anthracene	1625 GC/MS (isotope): 10 ug/L	40000	10	31.8
8	Antimony	206.2 - AA furnace: 1 ug/L	5.6	1	3.18
9	Arsenic		10		
10	Asbestos				
11	Barium	200.7 - ICP and 208.2 - AA furnace: 2 ug/L	1000	2	6.36
12	Benzene	602 - GC/PID: 0.2 ug/L	2.2	0.2	0.636
13	Benzidine	605 - HPLC: 0.08 ug/L	0.000086	0.08	0.2544
14	Benzo(a)anthrecene	610 - HPLC: 0.013 ug/L	0.0038	0.013	0.04134
15	Benzo(a)Pyrene	610 - HPLC: 0.023 ug/L	0.0038	0.023	0.07314
16	Benzo(b)Fluoranthene	610 - HPLC: 0.018 ug/L	0.0038	0.017	0.05406
17	Benzo(k)Fluoranthene	610 - HPLC: 0.017 ug/L	0.0038	0.018	0.05724
18	Beryllium	210.2 - AA furnace: 0.2 ug/L	4	0.2	0.636
19	alpha-BHC	608 - GC/ECD: 0.003 ug/L	0.0026	0.003	0.00954
20	beta-BHC	608 - GC ECD: 0.006 ug/L	0.0091	0.006	0.01908
21	gamma-BHC	608 - GC/ECD: 0.004 ug/L	0.019	0.004	0.01272
22	Bis(2-Chloroethyl)Ether	611 - GC/Hal.: 0.3 ug/L	0.03	0.3	0.954
23	Bis(2-Chloroisopropyl) Ether	611 - GC/Hal.: 0.8 ug/L	1400	0.8	2.544
24	Bis(2-Ethylhexyl)Phthalate	606 - GC/ECD: 2 ug/L	1.2	2	6.36
25	Bromoform	601 - GC/Hal.: 0.2 ug/L	4.3	0.2	0.636
26	Butylbenzyl Phthalate	606 - GC/ECD: 0.34 ug/L	1500	0.34	1.0812
27	Cadium	213.2 - AA furnace: 0.1 ug/L			
28	Carbon Tetrachloride	601 - GC/Hal.: 0.12 ug/L	0.23	0.12	0.3816
29	Chlordane	608 - GC/ECD: 0.014 ug/L	0.00008	0.014	0.04452
30	Chloride	300.1 - IC: 4 ug/L	250000	4	12.72
31	Total Residene Chlorine				
32	Chlorobenzene	602 - GC/PID: 0.2 ug/L	680	0.2	0.636
33	Chlorodibromomethane	601 - GC/Hal.: 0.09 ug/L	0.4	0.09	0.2862
34	Chloroform	601 - GC/Hal.: 0.05 ug/L	5.7	0.05	0.159
35	2-Chloronaphthalene	612 - GC/ECD: 0.94 ug/L	1000	0.94	2.9892
36	2-Chlorophenol	604 - GC/FID: 0.31 ug/L	81	0.31	0.9858
	MDL and Action Level Greater than Criteria	[redacted]			
	Action Level Greater than Criteria	[redacted]			

Attachment II
Method Detection Limit Information

Parameter Number	Parameter	Approved Analytical Method	Lowest Proposed Standard (µg/L)	Method Detection Limit µg/L	DEP Action Level µg/L
37	Chlorophenoxy Herbicide (2,4-D)	O-3105 - GC/ECD: 0.01 ug/L	100	0.001	0.00318
38	Chlorophenoxy Herbicide (2,4,5-TP)	O-3105 - GC/ECD: 0.01 ug/L	10	0.001	0.00318
39	Chloropyrifos	8141 - GC/FPD: 0.07 ug/L	0.041	0.07	0.2226
40	Chromium III				
41	Chromium VI (dissolved)	218.4 - AA extraction: 10 ug/L	50	10	31.8
42	Chrysene	610 - HPLC: 0.15 ug/L	0.0038	0.15	0.477
43	Copper	220.2 - AA furnace: 1 ug/L	9	1	3.18
44	Cyanide	335.3 - Spectrophotometry: 5 ug/L	5	5	15.9
45	4,4'-DDD	608 - GC/ECD: 0.011 ug/L	0.00031	0.011	0.03498
46	4,4'-DDE	608 - GC/ECD: 0.004 ug/L	0.00022	0.004	0.01272
47	4,4'-DDT	608 - GC/ECD: 0.012 ug/L	0.00022	0.012	0.03816
48	Demeton		0.1		
49	Dibenzo(a,h)Anthracene	610 - HPLC: 0.03 ug/L	0.0038	0.03	0.0954
50	1,2-Dichlorobenzene	602 - GC/PID: 0.4 ug/L	2700	1.9	6.042
51	1,3-Dichlorobenzene	602 - GC/PID: 0.4 ug/L	320	1.9	6.042
52	1,4-Dichlorobenzene	602 - GC/PID: 0.3 ug/L	400	4.4	13.992
53	3,3'-Dichlorobenzidine	605 - HPLC: 0.13 ug/L	0.021	0.13	0.4134
54	Dichlorobromomethane	601 - GC/Hal.: 0.1 ug/L	0.55	0.1	0.318
55	1,2-Dichloroethane	601 - GC/Hal.: 0.03 ug/L	0.38	0.03	0.0954
56	1,1-Dichloroethylene	601 - GC/Hal.: 0.13 ug/L	0.03	0.13	0.4134
57	2,4-Dichlorophenol	604 - GC/FID: 0.39 ug/L	77	0.39	1.2402
58	1,2-Dichloropropane	502.2 - GC/PELCD: 0.010 ug/L	0.5	0.01	0.0318
59	1,3-Dichloropropene	601 - GC/Hal.: 0.20-trans	10	0.2	0.636
60	Dieldrin	608 - GC/ECD: 0.002 ug/L	0.000052	0.002	0.00636
61	Diethyl Phthalate	606 - GC/ECD: 0.49 ug/L	17000	0.49	1.5582
62	2,4-Dimethylphenol	604 - GC/FID: 0.32 ug/L	380	0.32	1.0176
63	Dimethyl Phthalate	606 - GC/ECD: 0.29 ug/L	270000	0.29	0.9222
64	Di-n-Butyl Phthalate	606 - GC/ECD: 0.36 ug/L	2000	0.36	1.1448
65	2,4-Dinitrophenol	604 - GC/FID: 13 ug/L	69	13	41.34
66	Dinitrophenols		69	13	41.34
67	2,4-Dinitrotoluene	609 - GC/ECD: 0.02 ug/L	0.11	0.02	0.0636
68	1,2-Diphenylhydrazine	625 - GC/MS: 10 ug/L	0.036	10	31.8
69	alpha-Endosulfan	608 - GC/ECD: 0.014 ug/L	62	0.014	0.04452
70	beta-Endosulfan	608 - GC/ECD: 0.004 ug/L	62	0.004	0.01272
71	Endosulfan	608 - GC/ECD: 0.066 ug/L	62	0.006	0.01908
72	Endrin	608 - GC/ECD: 0.006 ug/L	0.76	0.006	0.01908
73	Endrin Aldehyde	608 - GC/ECD: 0.023 ug/L	0.29	0.023	0.07314
	MDL and Action Level Greater than Criteria	[redacted]			
	Action Level Greater than Criteria	[redacted]			

Attachment II
Method Detection Limit Information

Parameter Number	Parameter	Approved Analytical Method	Lowest Proposed Standard (µg/L)	Method Detection Limit µg/L	DEP Action Level µg/L
74	Ether Bis(Chloromethyl)		0.0001	10	31.8
75	Ethylbenzene	602 - GC/PID: 0.2 ug/L	3100	0.2	0.636
76	Fecal Coliform		NAp	NAp	NAp
77	Fluoranthene	610 - HPLC: 0.21 ug/L	130	0.2	0.636
78	Fluorene	610 - HPLC: 0.21 ug/L	1100	0.21	0.6678
79	Fluoride	340.3 - colorimetric: 50 ug/L	1400	50	159
80	Guthion	8141 - GC/FPD: 0.10 ug/L	0.01	0.1	0.318
81	Halomethanes		0.19		0
82	Heptachlor	608 - GC/ECD: 0.003 ug/L	0.000079	0.003	0.00954
83	Heptachlor Epoxide	608 - GC/ECD: 0.083 ug/L	0.000039	0.083	0.26394
84	Hexachlorobenzene	612 - GC/ECD: 0.05 ug/L	0.00028	0.05	0.159
85	Hexachlorobutadiene	612 - GC/ECD: 0.34 ug/L	0.44	0.34	1.0812
86	Hexachlorocyclo-hexane-Technical	608 - GC/ECD: 0.009 ug/L	0.0123	0.009	0.02862
87	Hexachlorocyclo-pentadiene	612 - GC/ECD: 0.4 ug/L	240	0.4	1.272
88	Hexachloroethane	612 - GC/ECD: 0.03 ug/L	1.4	0.03	0.0954
89	Ideno(1,2,3-cd)Pyrene	610 - HPLC: 0.043 ug/L	0.0038	0.043	0.13674
90	Iron	236.2 - AA furnace: 1 ug/L	500	1	3.18
91	Isophorone	625 - GC/MS: 2.2 ug/L	35	5.7	18.126
92	Lead	239.2 - AA furnace: 1 ug/L	15	1	3.18
93	Malathion	8141B - GC/FPD: 5.5 ug/L	0.1	5.5	17.49
94	Manganese	243.2 - AA furnace: 0.2 ug/L	1000	0.2	0.636
95	Mercury - dissolved		0.77		
96	Methoxychlor	505 - Microextraction and GC/ECD: 0.956 ug/L	0.03	0.956	3.04008
97	Methyl Bromide	601 - GC/Hal.: 1.18 ug/L	47	1.18	3.7524
98	Methylene Chloride	601 - GC/Hal.: 0.25 ug/L	4.6	0.25	0.795
99	2-Methyl-4,6-Dinitrophenol	604 - GC/FID: 16 ug/L	13	16	50.88
100	Mirex	8270B - GC/MS: 10 ug/L	0.001	10	31.8
101	Nickel	249.2 - AA furnace: 1 ug/L	610	1	3.18
102	Nitrate (as Nitrate N)	300.0 - IC: 2 ug/L	10000	2	6.36
103	Nitrobenzene	625 - GC/MS: 1.9 ug/L	17	1.9	6.042
104	Nitrosamines		0.0008		
105	Nitrosodibutylamine, N		0.0063		
106	Nitrosodiethylamine, N	1625 - GC/MS: 10 ug/L	0.0008	10	31.8
107	N-Nitrosodimethylamine	607 - GC/N-PD: 0.15 ug/L	0.00069	0.15	0.477
108	N-Nitrosodi-n-Propylamine	607 - GC/ECD: 0.46 ug/L	0.005	0.46	1.4628
109	N-Nitrosodiphenylamine	607 - GC/N-PD: 0.81 ug/L	3.3	0.81	2.5758
110	Nitrosopyrrolidine, N	8270 - GC/MS: 40 ug/L	0.016	40	127.2
111	Threshold odor		NAp	NAp	NAp
	MDL and Action Level Greater than Criteria	[redacted]			
	Action Level Greater than Criteria	[redacted]			

Attachment II
Method Detection Limit Information

Parameter Number	Parameter	Approved Analytical Method	Lowest Proposed Standard (µg/L)	Method Detection Limit µg/L	DEP Action Level µg/L
112	Dissolved Oxygen		NAp	NAp	NAp
113	Parathion	8141 - GC/FPD: 0.06 ug/L	0.013	0.06	0.1908
114	Pentachlorobenzene	8270D - GC/MS: 10 ug/L	1.4	10	31.8
115	Pentachlorophenol	604 - GC/ECD: 0.59 ug/L	0.27	0.59	1.8762
116	pH		NAp	NAp	NAp
117	Phenol	604 - GC/FID: 0.14 ug/L	21000	0.14	0.4452
118	Phthalate esters		3	10	31.8
119	PCB		.000044 TOTAL	0.065 single isomer	0.2067
120	Polynuclear Aromatic Hydrocarbons (PAH)		0.0028	10 per isomer	31.8
121	Pyrene	610 - HPLC: 0.27 ug/L	830	10	31.8
122	Radionuclides				
123	Radionuclides				
124	Selenium	270.2 - AA furnace and 270.3 - AA hydride: 2 ug/L	5	2	6.36
125	Silver	272.2 - AA furnace: 0.2 ug/L		0.2	0.636
126	Solids Dissolved and Salinity		250000		
127	Sulfide - Hydrogen Sulfide		2		
128	Dioxin (2,3,7,8-TCDD)	613 - GC/MS: 0.002 ug/L	0.000000005	0.000001	3.18E-06
129	Tempature		NAp	NAp	NAp
130	Tetrachlorobenzene, 1,2,4,5	8270D - GC/MS: 10 ug/L	0.97	10	31.8
131	1,1,2,2-tetrachloroethane	601 - GC/Hal.: 0.03 ug/L	0.17	0.03	0.0954
132	Tetrachloroethylene	601 - GC/Hal.: 0.03 ug/L	0.69	0.03	0.0954
133	Thallium	279.2 - AA furnace: 1 ug/L	1.7	1	3.18
134	Toluene	602 - GC/PID: 0.2 ug/L	6800	0.2	0.636
135	Toxaphene	608 - GC/ECD: 0.24 ug/L	0.00028	0.24	0.7632
136	1,2-Trans-Dichloroethylene	601 - GC/Hal.: 0.1 ug/L	700	0.1	0.318
137	Tributyltin (TBT)		0.46		
138	1,2,4-Trichlorobenzene	612 - GC/ECD: 0.05 ug/L	260	0.05	0.159
139	1,1,1-trichloroethane	601 - GC/Hal.: 0.03 ug/L	12000	0.03	0.0954
140	1,1,2-trichloroethane	601 - GC/Hal.: 0.02 ug/L	0.59	0.02	0.0636
141	Trichloroethylene	601 - GC/Hal.: 0.12 ug/L	2.5	0.12	0.3816
142	Trichlorophenol, 2,4,5-	1625 - GC/MS: 10 ug/L	1800	10	31.8
143	2,4,6-Trichlorophenol	604 - GC/ECD: 0.58 ug/L	1.4	0.58	1.8444
144	Turbidity		NAp	NAp	NAp
145	Vinyl chloride	601 - GC/Hal.: 0.18 ug/L	2	0.18	0.5724
146	Zinc	3500-Zn E (Colorimetric): 1 ug/L	120	1	3.18
	MDL and Action Level Greater than Criteria	[redacted]			
	Action Level Greater than Criteria	[redacted]			

Attachment III

Comparison of the USEPA Recommended Harmonic Mean Flow to WV 7Q10 Flow for 10^{-6} Cancer Risk Calculations for Existing Compounds

Parameter Number	Parameter Name	Criteria value for 10^{-6} cancer risk based on EPA use of HMF in development of criteria	Appropriate criteria value for 10^{-6} cancer if HMF is 3 time 7Q10	Appropriate criteria value for 10^{-6} cancer risk if WV 7Q10 flow is 40% of HMF	MDL (µg/L)	PQL based on DEP Policy (µg/L)	Analytical issues based on MDL	Analytical issues based on Action Limit
3	Acrylonitrile	0.051	0.153	0.1275	0.5	1.59	Yes	Yes
4	Aldrin	0.000049	0.000147	0.0001225	0.004	0.01272	No	No
9	Arsenic	10	30	25				
12	Benzene	2.2	6.6	5.5	0.2	0.636	No	No
19	alpha-BHC	0.0026	0.0078	0.0065	0.003	0.00954	OK for adjusted values	Yes
20	beta-BHC	0.0091	0.0273	0.02275	0.006	0.01908	No	No
21	gamma-BHC	0.019	0.057	0.0475	0.004	0.01272	No	No
28	Carbon Tetrachloride	0.23	0.69	0.575	0.12	0.3816	No	No
29	Chlordane	0.0008	0.0024	0.002	0.014	0.04452	No	No
32	Chlorobenzene	680	2040	1700	0.2	0.636	No	No
34	Chloroform	5.7	17.1	14.25	0.05	0.159	No	No
47	4,4'-DDT	0.00022	0.00066	0.00055	0.012	0.03816	Yes	Yes
55	1,2-Dichloroethane	0.38	1.14	0.95	0.03	0.0954	No	No
56	1,1-Dichloroethylene	0.03	0.09	0.075	0.13	0.4134	Yes	Yes
60	Dieldrin	0.000052	0.000156	0.00013	0.002	0.00636	Yes	Yes
67	2,4-Dinitrotoluene	0.11	0.33	0.275	0.02	0.0636	No	No
82	Heptachlor	0.000079	0.000237	0.0001975	0.003	0.00954	Yes	Yes
84	Hexachlorobenzene	0.00028	0.00084	0.0007	0.05	0.159	Yes	Yes
115	Pentachlorophenol	0.27	0.81	0.675	0.59	1.8762	Yes	Yes
119	PCB	0.000044 Total	0.000132	0.00011				
120	Polynuclear Aromatic Hydrocarbons (PAH)	0.0028	0.0084	0.007				
128	Dioxin (2,3,7,8-TCDD)	0.000000005	0.000000015	1.25E-08	0.002	0.00636	Yes	Yes
131	1,1,2,2-tetrachloroethane	0.69	2.07	1.725	0.03	0.0954	No	No
132	Tetrachloroethylene	0.69	2.07	1.725	0.03	0.0954	No	No
134	Toluene							
135	Toxaphene	0.00028	0.00084	0.0007	0.24	0.7632	Yes	Yes

Attachment III

Comparison of the USEPA Recommended Harmonic Mean Flow to WV 7Q10 Flow for 10^{-6} Cancer Risk Calculations for Existing Compounds

Parameter Number	Parameter Name	Criteria value for 10^{-6} cancer risk based on EPA use of HMF in development of criteria	Appropriate criteria value for 10^{-6} cancer if HMF is 3 time 7Q10	Appropriate criteria value for 10^{-6} cancer risk if WV 7Q10 flow is 40% of HMF	MDL (µg/L)	PQL based on DEP Policy (µg/L)	Analytical issues based on MDL	Analytical issues based on Action Limit
139	1,1,1-trichloroethane	12000	36000	30000	0.03	0.0954	No	No
141	Trichloroethylene	2.5	7.5	6.25	0.12	0.3816	No	No
143	2,4,6-Trichlorophenol	1.4	4.2	3.5	0.58	1.8444	No	No
145	Vinyl chloride	2	6	5	0.18	0.5724	No	No

Attachment IV

Comparison of USEPA Recommended Harmonic Mean Flow to WV 7Q10 flow for 10^{-6} Cancer Risk Calculations for Proposed Compounds

Parameter Number	Parameter Name	Criteria value for 10^{-6} cancer risk based on EPA use of HMF in development of criteria	Appropriate criteria value for 10^{-6} cancer if HMF is 3 time 7Q10	Appropriate criteria value for 10^{-6} cancer risk if WV 7Q10 flow is 40% of HMF	MDL (µg/L)	PQL based on DEP Policy (µg/L)	Analytical issues based on MDL	Analytical issues based on Action Limit
7	Anthracene	40000	120000	100000	10	31.8	No	No
13	Benzidine	0.000086	0.000258	0.000215	0.08	0.2544	Yes	Yes
14	Benzo(a)anthrecene	0.0038	0.0114	0.0095	0.013	0.04134	Yes	Yes
15	Benzo(a)Pyrene	0.0038	0.0114	0.0095	0.023	0.07314	Yes	Yes
16	Benzo(b)Fluoranthene	0.0038	0.0114	0.0095	0.018	0.05724	Yes	Yes
17	Benzo(k)Fluoranthene	0.0038	0.0114	0.0095	0.017	0.05406	Yes	Yes
22	Bis(2-Chloroethyl)Ether	0.03	0.09	0.075	0.3	0.954	Yes	Yes
24	Bis(2-Ethylhexyl)Phthalate	1.2	3.6	3	2	6.36	OK for adjusted values	Yes
25	Bromoform	4.3	12.9	10.75	0.2	0.636	No	No
33	Chlorodibromomethane	0.4	1.2	1	0.09	0.2862	No	No
42	Chrysene	0.0038	0.0114	0.0095	0.15	0.477	Yes	Yes
45	4,4'-DDD	0.00031	0.00093	0.000775	0.011	0.03498	Yes	Yes
46	4,4'-DDE	0.00022	0.00066	0.00055	0.004	0.01272	Yes	Yes
49	Dibenzo(a,h)Anthracene	0.0038	0.0114	0.0095	0.03	0.0954	Yes	Yes
53	3,3'-Dichlorobenzidine	0.021	0.063	0.0525	0.13	0.4134	Yes	Yes
54	Dichlorobromomethane	0.55	1.65	1.375	0.1	0.318	No	No
58	1,2-Dichloropropane	0.5	1.5	1.25	0.01	0.0318	No	No
59	1,3-Dichloropropene	10	30	25	0.2	0.636	No	No
68	1,2-Diphenylhydrazine	0.036	0.108	0.09	10	31.8	Yes	Yes
74	Ether Bis(Chloromethyl)	0.0001	0.0003	0.00025				
83	Heptachlor Epoxide	0.000039	0.000117	0.0000975	0.083	0.26394	Yes	Yes
85	Hexachlorobutadiene	0.44	1.32	1.1	0.34	1.0812	OK for adjusted values	OK for adjusted values
86	Hexachlorocyclo-hexane-Technical	0.0123	0.0369	0.03075	0.009	0.02862	No	Yes

Attachment IV

Comparison of USEPA Recommended Harmonic Mean Flow to WV 7Q10 flow for 10^{-6} Cancer Risk Calculations for Proposed Compounds

Parameter Number	Parameter Name	Criteria value for 10^{-6} cancer risk based on EPA use of HMF in development of criteria	Appropriate criteria value for 10^{-6} cancer if HMF is 3 time 7Q10	Appropriate criteria value for 10^{-6} cancer risk if WV 7Q10 flow is 40% of HMF	MDL (µg/L)	PQL based on DEP Policy (µg/L)	Analytical issues based on MDL	Analytical issues based on Action Limit
88	Hexachloroethane	1.4	4.2	3.5	0.03	0.0954	No	No
89	Ideno(1,2,3-cd)Pyrene	0.0038	0.0114	0.0095	0.043	0.13674	Yes	Yes
91	Isophorone	35	105	87.5	2.2	6.996	No	No
98	Methylene Chloride	4.6	13.8	11.5	0.25	0.795	No	No
105	Nitrosodibutylamine, N	0.0063	0.0189	0.01575				
106	Nitrosodiethylamine, N	0.0008	0.0024	0.002	10	31.8	Yes	Yes
107	N-Nitrosodimethylamine	0.00069	0.00207	0.001725	0.15	0.477	Yes	Yes
108	N-Nitrosodi-n-Propylamine	0.005	0.015	0.0125	0.46	1.4628	Yes	Yes
109	N-Nitrosodiphenylamine	3.3	9.9	8.25	0.81	2.5758	No	No
110	Nitrosopyrrolidine, N	0.016	0.048	0.04	40	127.2	Yes	Yes
140	1,1,2-trichloroethane	0.59	1.77	1.475	0.02	0.0636	No	No

Attachment V
Organoleptic Information

Organoleptic	Toxicity Based Standard in Proposed WV standards(µg/L)	EPA Organoleptic Standard (µg/L)
Acenapthene	670	20
chlorobenzene	not listed	20
nitrobenzene	not listed	30
phenol	21,000	300
2-chlorophenol	81	0.1
2,4-dichlorophenol	77	0.3
pentachlorophenol	1800	60
2,4,7-trichlorophenol	1800	2
plus 15 other compounds with organoletptic standards not currently listed in WV Proposed Standards		

From EPA National Recommended Water Quality Criteria: 2002 (December 8, 2002), page 28 and 29

Attachment VI
Summary Information

Parameter Number	Parameter	CAS Number	New Parameter (Y/N)	Change versus current WV WQS (yes/no)	Issue with Flow	Carcinogen	Organoleptics	One or more Criteria Below MDL (analytical issue)	More Stringent than EPA	Technical Issue
1	Acenaphthene	83329	Yes	Yes	No	No	Yes	No	No	Of the surrounding states Aluminum has only been adpoted by PA
2	Acrolein	107028	Yes	Yes	No	No	No	No	No	
3	Acrylonitrile	107131	No	Yes	Yes	Yes	No	Yes	Yes	
4	Aldrin	309002	No	Yes	Yes	Yes	No	Yes	Yes	
5	Aluminum (dissolved)	7429905	No	No	No	No	No	No	No	
6	Ammonia	7664417	No	Yes	No	No	No	No	No	
7	Anthracene	120127	Yes	Yes	Yes	Yes	No	No	Yes	
8	Antimony	7440360	No	Yes	No	No	No	Yes	No	
9.a	Arsenic	7440382	No	Yes	Yes	Yes	No		Yes	Use of Drinking Water standards for Category B. Removed All Other Use Designation.
9.b	Arsenic (dissolved trivalent)	7440382	No	No	Yes	Yes	No		Yes	
10	Asbestos	1332214	Yes	Yes	No	No	No		No	Based on Safe Drinking Water standards. Safe Drinking Water should be applied after conventional water treatment.
11	Barium	7440393	No	No	No	No	No	No	No	
12	Benzene	71432	No	Yes	Yes	Yes	No	No	Yes	
13	Benzidine	92875	Yes	Yes	Yes	Yes	No	Yes	Yes	
14	Benzo(a)anthrecene	56443	Yes	Yes	Yes	Yes	No	Yes	Yes	
15	Benzo(a)Pyrene	50328	Yes	Yes	Yes	Yes	No	Yes	Yes	
16	Benzo(b)Fluoranthene	205992	Yes	Yes	Yes	Yes	No	Yes	Yes	
17	Benzo(k)Fluoranthene	207089	Yes	Yes	Yes	Yes	No	Yes	Yes	
18	Beryllium	7440417	No	Yes	No	No	No	No	No	Based on Safe Drinking Water standards. Safe Drinking Water should be applied after conventional water treatment.
19	alpha-BHC	319846	No	Yes	Yes	Yes	No	Yes	Yes	
20	beta-BHC	319851	No	Yes	Yes	Yes	No	No	Yes	
21	gamma-BHC	58899	No	Yes	Yes	Yes	No	No	Yes	
22	Bis(2-Chloroethyl)Ether	111444	Yes	Yes	Yes	Yes	No	Yes	Yes	

Attachment VI
Summary Information

Parameter Number	Parameter	CAS Number	New Parameter (Y/N)	Change versus current WV WQS (yes/no)	Issue with Flow	Carcinogen	Organoleptics	One or more Criteria Below MDL (analytical issue)	More Stringent than EPA	Technical Issue
23	Bis(2-Chloroisopropyl) Ether	108601	Yes	Yes	No	No	No	No	No	
24	Bis(2-Ethylhexyl)Phthalate	117817	Yes	Yes	Yes	Yes	No	Yes	Yes	
25	Bromoform	75252	Yes	Yes	Yes	Yes	No	No	Yes	
26	Butylbenzyl Phthalate	85687	Yes	Yes	No	No	No	Yes	No	
27.a	Cadmium	7440439	No	No	No	No	No	Yes	No	Use of Drinking Water standards for Category B
27.c	Cadmium (dissolved), 1-hou	7440439	No	Yes	No	No	No	Yes	No	Believe the 1.28 in the equation should be 1.128
27.b	Cadmium (dissolved), 4-day	7440439	No	No	No	No	No	Yes	No	
28	Carbon Tetrachloride	56235	No	Yes	Yes	Yes	No	No	Yes	
29	Chlordane	57749	No	Yes	Yes	Yes	No	Yes	Yes	Remove All Other Use designation.
30	Chloride	16887006	No	No	No	No	No	No	No	
31.a	Total Residual Chlorine	7782505	No	No	No	No	No		No	
31.b	Total Residual Chlorine	7782505	No	No	No	No	No		No	
32	Chlorobenzene	108907	No	No	Yes	Yes	Yes	No	Yes	
33	Chlorodibromomethane	124481	Yes	Yes	Yes	Yes	No	No	Yes	
34	Chloroform	67663	No	No	Yes	Yes	No	No	Yes	
35	2-Chloronaphthalene	91587	Yes	Yes	No	No	No	No	No	
36	2-Chlorophenol	95578	No	Yes	No	No	Yes	No	no	
37	Chlorophenoxy Herbicide (2,	94757	Yes	Yes	No	No	No	No	no	Pesticide that may or may not be present in WV waters. The Board has not provided evidence that this compound is impairing any WV water from designated use.
38	Chlorophenoxy Herbicide (2,4,5-TP)	93721	Yes	Yes	No	No	No	No	No	Pesticide that may or may not be present in WV waters. The Board has not provided evidence that this compound is impairing any WV water from designated use.
39	Chloropyrifos	2921882	Yes	Yes	No	No	No	Yes	no	
40.a	Chromium III, 1-hour avg.	16065831	No	No	No	No	No		no	

Attachment VI
Summary Information

Parameter Number	Parameter	CAS Number	New Parameter (Y/N)	Change versus current WV WQS (yes/no)	Issue with Flow	Carcinogen	Organoleptics	One or more Criteria Below MDL (analytical issue)	More Stringent than EPA	Technical Issue
40.b	Chromium III, 4-day avg.	16065831	No	No	No	No	No		no	
41	Chromium VI (dissolved)	18540299	No	No	No	No	No	No	no	
42	Chrysene	218019	Yes	Yes	No	No	No	Yes	No	
43.a	Copper	7440508	No	Yes	No	No	No	No	Yes	EPA uses an equation based on hardness. WV proposes numerical criteria based on a hardness of 100
43.c	Copper, 1-hour avg.	7440508	No	No	No	No	No	No	No	
43.b	Copper, 4-day avg.	7440508	No	No	No	No	No	No	No	
44	Cyanide	57125	No	No	No	No	No	No	No	
45	4,4'-DDD	72548	Yes	Yes	Yes	Yes	No	Yes	Yes	
46	4,4'-DDE	72559	Yes	Yes	Yes	Yes	No	Yes	Yes	
47	4,4'-DDT	50293	No	Yes	Yes	Yes	No	Yes	Yes	Remove All Other Use designation.
48	Demeton	8065483	Yes	Yes	No	No	No		No	Pesticide that may or may not be present in WV waters. The Board has not provided evidence that this compound is impairing any WV water from designated use.
49	Dibenzo(a,h)Anthracene	53703	Yes	Yes	Yes	Yes	No	Yes	Yes	
50	1,2-Dichlorobenzene	95501	No	No	No	No	No	No	No	
51	1,3-Dichlorobenzene	541731	No	Yes	No	No	No	No	No	
52	1,4-Dichlorobenzene	106467	No	No	No	No	No	No	No	
53	3,3'-Dichlorobenzidine	91941	Yes	Yes	Yes	Yes	No	Yes	Yes	
54	Dichlorobromomethane	75274	Yes	Yes	Yes	Yes	No	Yes	Yes	
55	1,2-Dichloroethane	107062	No	Yes	Yes	Yes	No	Yes	Yes	
56	1,1-Dichloroethylene	75354	No	No	Yes	Yes	No	Yes	Yes	
57	2,4-Dichlorophenol	120832	No	Yes	No	No	Yes	No	no	
58	1,2-Dichloropropane	78875	Yes	Yes	Yes	Yes	No	No	Yes	
59	1,3-Dichloropropene	542756	Yes	Yes	Yes	Yes	No	No	Yes	
60	Dieldrin	60571	No	Yes	No	No	No	Yes	no	Remove All Other Use designation.
61	Diethyl Phthalate	84662	Yes	Yes	No	No	No	No	No	

Attachment VI
Summary Information

Parameter Number	Parameter	CAS Number	New Parameter (Y/N)	Change versus current WV WQS (yes/no)	Issue with Flow	Carcinogen	Organoleptics	One or more Criteria Below MDL (analytical issue)	More Stringent than EPA	Technical Issue
62	2,4-Dimethylphenol	105679	No	Yes	No	No	No	No	No	
63	Dimethyl Phthalate	131113	Yes	Yes	No	No	No	No	No	
64	Di-n-Butyl Phthalate	84742	Yes	Yes	No	No	No	No	No	
65	2,4-Dinitrophenol	51285	No	Yes	No	No	No	No	no	
66	Dinitrophenols	25550587	No	Yes	No	No	No	No	no	
67	2,4-Dinitrotoluene	121142	No	Yes	Yes	Yes	No	No	Yes	
68	1,2-Diphenylhydrazine	122667	Yes	Yes	Yes	Yes	No	Yes	Yes	
69	alpha-Endosulfan	959988	Yes	Yes	No	No	No	No	no	
70	beta-Endosulfan	33213659	Yes	Yes	No	No	No	No	no	
71	Endosulfan Sulfate	1031078	Yes	Yes	No	No	No	No	no	
72	Endrin	72208	No	Yes	No	No	No	No	no	Remove All Other Use designation.
73	Endrin Aldehyde	7421934	Yes	Yes	No	No	No	No	no	
74	Ether Bis(Chloromethyl)	542881	Yes	Yes	Yes	Yes	No	Yes	Yes	
75	Ethylbenzene	100414	No	No	No	No	No	Yes	No	
76.a	Fecal Coliform		No	Yes	No	No	No	NA	No	
76.b	Fecal Coliform - Ohio River		No	Yes	No	No	No	NA	No	
77	Fluoranthene	206440	No	Yes	No	No	No	No	no	
78	Fluorene	86737	Yes	Yes	No	No	No	No	no	
79	Fluoride	7782414	No	Yes	No	No	No	No	No	
80	Guthion	86500	Yes	Yes	No	No	No	Yes	No	
81	Halomethanes		No	No	No	No	No		No	
82	Heptachlor	76448	No	Yes	Yes	Yes	No	Yes	Yes	
83	Heptachlor Epoxide	1024573	Yes	Yes	Yes	Yes	No	Yes	Yes	
84	Hexachlorobenzene	118741	No	Yes	Yes	Yes	No	Yes	Yes	
85	Hexachlorobutadiene	87683	Yes	Yes	Yes	Yes	No	Yes	Yes	
86	Hexachlorocyclo-hexane-Tec	319868	Yes	Yes	Yes	Yes	No	No	Yes	
87	Hexachlorocyclo-pentadiene	77474	Yes	Yes	No	No	No	No	No	
88	Hexachloroethane	67721	Yes	Yes	Yes	Yes	No	n	Yes	
89	Ideno(1,2,3-cd)Pyrene	193395	Yes	Yes	Yes	Yes	No	Yes	Yes	
90	Iron	7439896	No	No	No	No	No	No	No	
91	Isophorone	78591	Yes	Yes	No	No	No	No	No	

Attachment VI
Summary Information

Parameter Number	Parameter	CAS Number	New Parameter (Y/N)	Change versus current WV WQS (yes/no)	Issue with Flow	Carcinogen	Organoleptics	One or more Criteria Below MDL (analytical issue)	More Stringent than EPA	Technical Issue
92.a	Lead	7439921	No	Yes	No	No	No	No	No	Based on Safe Drinking Water standards. Safe Drinking Water should be applied after conventional water treatment.
92.b	Lead (4 day dissolved lead)	7439921	No	No	No	No	No	No	No	
92.c	Lead (one hour average diss	7439921	No	No	No	No	No	No	No	
92.c	Lead (one hour average diss	7439921	No	No	No	No	No	No	No	
93	Malathion	121755	Yes	Yes	No	No	No	Yes	no	Pesticide that may or may not be present in WV waters. The Board has not provided evidence that this compound is impairing any WV water from designated use.
94	Manganese		No	No	No	No	No	No	no	
95.c	Mercury (body burden)	7439976	No	No	No	No	No		No	
95.b	Mercury (total unfiltered)	7439976	No	Yes	No	No	No		No	
96	Methoxychlor	72435	Yes	Yes	No	No	No	Yes	No	Pesticide that may or may not be present in WV waters. The Board has not provided evidence that this compound is impairing any WV water from designated use.
97	Methyl Bromide	74839	Yes	Yes	No	No	No	No	no	
98	Methylene Chloride	75092	Yes	Yes	Yes	Yes	No	No	Yes	
99	2-Methyl-4,6-Dinitrophenol	534521	Yes	Yes	No	No	No	Yes	no	WV proposes use of set numbers versus EPA use of equation related to pH
100	Mirex	2385855	Yes	Yes	No	No	No	Yes	No	Insecticide primarily used in Southeastern US for fire ant control. Discontinued use in 1972. No evidence in WV waters.
101.a	Nickel	7440020	No	Yes	No	No	No	No	No	
101.b	Nickel (4 day average)	7440020	No	No	No	No	No	No	No	

Attachment VI
Summary Information

Parameter Number	Parameter	CAS Number	New Parameter (Y/N)	Change versus current WV WQS (yes/no)	Issue with Flow	Carcinogen	Organoleptics	One or more Criteria Below MDL (analytical issue)	More Stringent than EPA	Technical Issue
101.c	Nickel (one hour average)	7440020	No	No	No	No	No	No	No	
102	Nitrate (as Nitrate N)	14797558	No	No	No	No	No	No	No	
103	Nitrobenzene	98953	Yes	Yes	No	No	Yes	No	no	
104	Nitrosamines		Yes	Yes	No	No	No		Yes	A number of individual compounds that make up this class have criteria greater than the criteria for the class.
105	Nitrosodibutylamine, N	924163	Yes	Yes	Yes	Yes	No		Yes	
106	Nitrosodiethylamine, N	55185	Yes	Yes	Yes	Yes	No	Yes	Yes	
107	N-Nitrosodimethylamine	62759	Yes	Yes	Yes	Yes	No	Yes	Yes	
108	N-Nitrosodi-n-Propylamine	621647	Yes	Yes	Yes	Yes	No	Yes	Yes	
109	N-Nitrosodiphenylamine	86306	Yes	Yes	Yes	Yes	No	No	Yes	
110	Nitrosopyrrolidine, N	930552	Yes	Yes	Yes	Yes	No	Yes	Yes	
111	Threshold odor		No	No	No	No	No	NAP	No	
113	Parathion	56382	Yes	Yes	No	No	No	Yes	no	Pesticide that may or may not be present in WV waters. The Board has not provided evidence that this compound is impairing any WV water from designated use.
114	Pentachlorobenzene	608935	Yes	Yes	No	No	No	Yes	no	
115	Pentachlorophenol	87865	No	Yes	Yes	Yes	Yes	Yes	Yes	WV proposes use of set numbers versus EPA use of equation related to pH
116	pH		no	Yes	No	No	No	NAP	No	Believe the pH range from 5 to 9 is in error for Cat A designated use
117	Phenol	108952	No	Yes	No	No	Yes	No	no	
118	Phthalate esters		No	No	No	No	No	Yes	no	

Attachment VI
Summary Information

Parameter Number	Parameter	CAS Number	New Parameter (Y/N)	Change versus current WV WQS (yes/no)	Issue with Flow	Carcinogen	Organoleptics	One or more Criteria Below MDL (analytical issue)	More Stringent than EPA	Technical Issue
119	PCB	1336363	No	No	Yes	Yes	No	Yes	Yes	EPA standard has 0.000064 for PCBs WV proposed has 0.000044. A number of individual compounds that make up this class have criteria greater than the criteria for the class.
120	Polynuclear Aromatic Hydrocarbons (PAH)		No	No	Yes	Yes	No	Yes	Yes	A number of individual compounds that make up this class have criteria greater than the criteria for the class.
121	Pyrene	129000	Yes	Yes	No	No	No	No	no	
122.a	Radionuclides		Yes		No	No	No		Yes	See written comments
124	Selenium	7782492	No	Yes	No	No	No	No	No	
125.a	Silver	7440224	No		No	No	No	No	No	
125.b	Silver (chronic)	7440224	No		No	No	No		No	
125.c	Silver (one hour average)	7440224	No	No	No	No	No	No	No	
126	Solids Dissolved and Salinity		Yes	Yes	No	No	No		No	
127	Sulfide - Hydrogen Sulfide	7783064	Yes	Yes	No	No	No		No	
128	2,3,7,8 - TCDD (dioxin)	1746016	No	Yes	Yes	Yes	No	Yes	Yes	Criteria is 2000 times greater that MDL for approved method.
129.a	Temperature		No		No	No	No	NAP	No	
130	Tetrachlorobenzene, 1,2,4,5	95943	Yes	Yes	No	No	No	Yes	no	
131	1,1,2,2-tetrachloroethane	79345	No	Yes	Yes	Yes	No	No	Yes	
132	Tetrachloroethylene	127184	No	Yes	Yes	Yes	No	No	Yes	
133	Thallium	7440280	No	No	No	No	No	No	No	
134	Toluene	108883	No	No	Yes	Yes	No	No	Yes	Footnoted as a carcinogen in WV proposed standards. Not listed as a carcinogen by USEPA
135	Toxaphene	8001352	No	Yes	Yes	Yes	No	Yes	Yes	Remove All Other Use designation.
136	1,2-Trans-Dichloroethylene	156605	Yes	Yes	No	No	No	No	No	

Attachment VI
Summary Information

Parameter Number	Parameter	CAS Number	New Parameter (Y/N)	Change versus current WV WQS (yes/no)	Issue with Flow	Carcinogen	Organoleptics	One or more Criteria Below MDL (analytical issue)	More Stringent than EPA	Technical Issue
137	Tributyltin (TBT)		Yes	Yes	No	No	No		No	
138	1,2,4-Trichlorobenzene	120821	Yes	Yes	No	No	No	No	no	
139	1,1,1-trichloroethane	71556	No	No	Yes	Yes	No	No	Yes	
140	1,1,2-trichloroethane	79005	Yes	Yes	Yes	Yes	No	No	Yes	
141	Trichloroethylene	79016	No	Yes	Yes	Yes	No	No	Yes	
142	Trichlorophenol, 2,4,5-	95954	Yes	Yes	No	No	Yes	No	No	
143	2,4,6-Trichlorophenol	88062	No	Yes	Yes	Yes	No	No	Yes	
144.a	Turbidity		No		No	No	No	NAP	No	
144.b	Turbidity		No		No	No	No	NAP	No	
144.c	Turbidity		No		No	No	No	NAP	No	
145	Vinyl chloride	75014	No	No	Yes	Yes	No	No	Yes	
146.b	Zinc (1 hour average)	7440666	No	No	No	No	No	No	no	
146.a	Zinc (4 day average)	7440666	No	No	No	No	No	No	no	

1. Acute and chronic aquatic life criteria for ammonia shall be determined using the National Criterion for Ammonia in Fresh Water from USEPA's 1999 Update of Ambient Water Quality Criteria for Ammonia (EPA -822-R-99-014, December 1999).

2. This recommended water quality criterion was devieved from data for arsenic (III), but is applied here to toatl arsenic, which might imply that arsenic (III) and arsenic (V) are equally toxic to aquate life and that their toxicities are additive. In the arsenic criteria document (EPA 440/5-84-033), January 1985), Species Mean Acute Values are given for both Arsenic (III) and Arsenic (v) for five species and the ratios of the SMARVs for each species range from 0.6 to 1.7.

Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. The recommended water quality criteria value was calculated by using the previous 304(a) aquatic life criteria expressed in terms of total recoverable metal, and mutiplying it by a conversion factor (CF). The term "Conversion Factor" (CF) represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable freaction in the water column to a criterion expressed as the total recoverable available.

3. Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. The recommended water quality criteria value was calculated by using the previous 304(a) aquatic life criteria expressed in terms of total recoverable metal, and mutiplying it by a conversion factor (CF). The term "Conversion Factor" (CF) represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable freaction in the water column to a criterion expressed as the total recoverable available.

The freshwater citerion for this metal is expressed as a function of hardness (mg/L) in the water column. The value given here corresponds to a hardness of 100mg/L. Criteria values for other hardness may be calculated from the following: CMC (dissolved) = exp{mA[ln(hardness)]+bA} (CF), or CCC (dissolved) = exp{mc[ln(hardness)]=bC} (CF) and the parameters specified in Appendix B-Parameters for Calculating Freshwater Dissolved Metals Criteria That Are Hardness - Dependent.

4. Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. The recommended water quality criteria value was calculated by using the previous 304(a) aquatic life criteria expressed in terms of total recoverable metal, and mutiplying it by a conversion factor (CF). The term "Conversion Factor" (CF) represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable freaction in the water column to a criterion expressed as the total recoverable available.

The freshwater citerion for this metal is expressed as a function of hardness (mg/L) in the water column. The value given here corresponds to a hardness of 100mg/L. Criteria values for other hardness may be calculated from the following: CMC (dissolved) = exp{mA[ln(hardness)]+bA} (CF), or CCC (dissolved) = exp{mc[ln(hardness)]=bC} (CF) and the parameters specified in Appendix B-Parameters for Calculating Freshwater Dissolved Metals Criteria That Are Hardness - Dependent.

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9. Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: CMC = exp(1.005(pH)-4.869); CCC = exp(1.005(pH)-5.134).

10. Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. The recommended water quality criteria value was calculated by using the previous 304(a) aquatic life criteria expressed in terms of total recoverable metal, and mutiplying it by a conversion factor (CF). The term "Conversion Factor" (CF) represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable freaction in the water column to a criterion expressed as the total recoverable available.

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