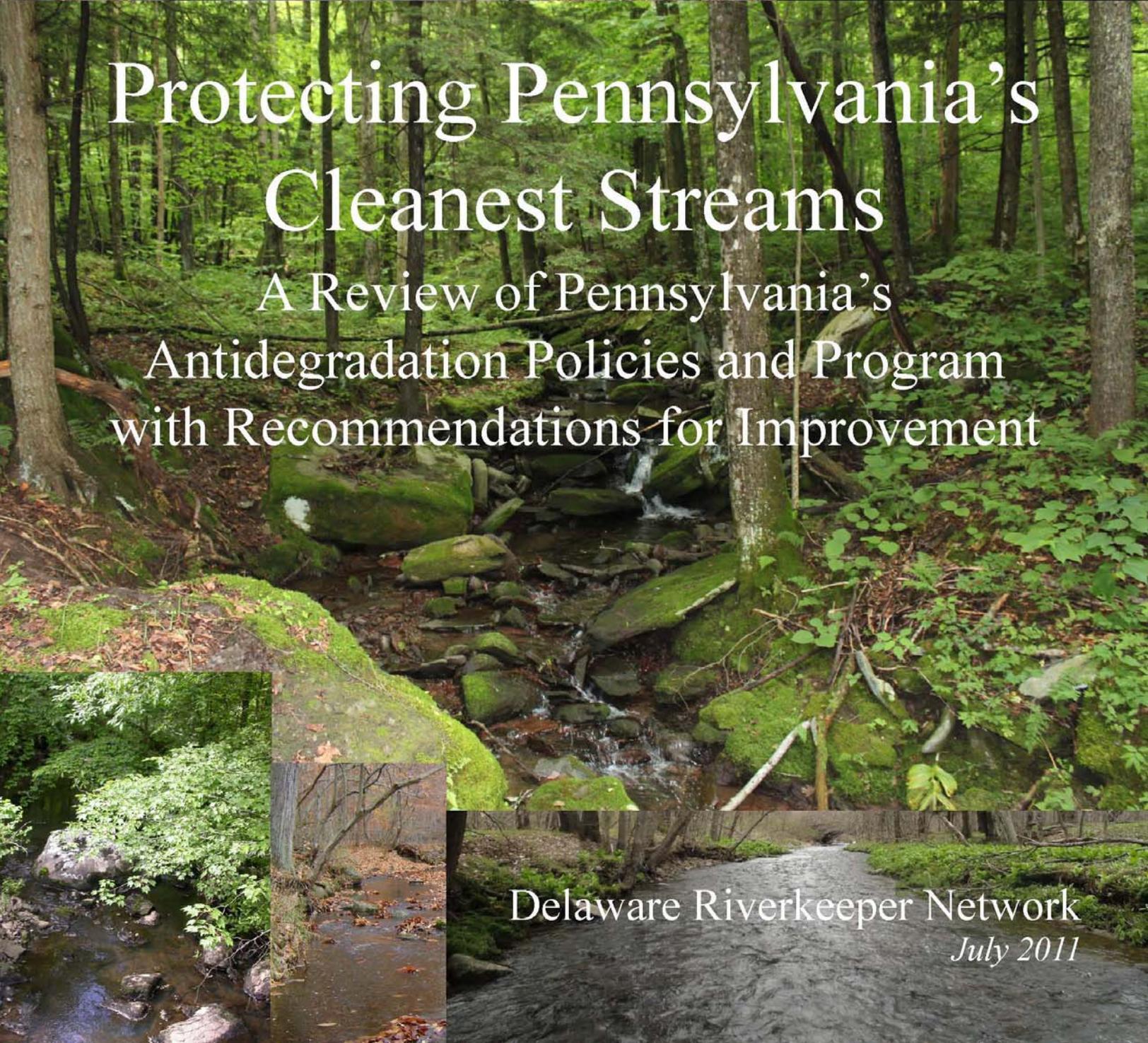




Protecting Pennsylvania's Cleanest Streams

A Review of Pennsylvania's
Antidegradation Policies and Program
with Recommendations for Improvement



Delaware Riverkeeper Network
July 2011



Delaware Riverkeeper Network

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The Delaware Riverkeeper Network (DRN) *is the only advocacy organization working throughout the entire Delaware River Watershed. The Delaware Riverkeeper is an individual who is the voice of the River, championing the rights of the River and its streams as members of our community. The Delaware Riverkeeper is assisted by seasoned professionals and a network of members, volunteers and supporters. Together they form the Delaware Riverkeeper Network, and together they stand as vigilant protectors and defenders of the River, its tributaries and watershed. The Delaware Riverkeeper Network is committed to restoring the watershed's natural balance where it has been lost and ensuring its preservation where it still exists.*

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Prepared by
the Delaware Riverkeeper Network

July 2011

Bristol, Pennsylvania

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An analysis of the protections provided by Pennsylvania's antidegradation policies and the implementation of its antidegradation program was undertaken by the Delaware Riverkeeper Network (DRN). This report summarizes that work. The investigations undertaken to support this report took place began in 2008 and were completed in 2011. This report is published by DRN as a service to all the Pennsylvania communities that depend upon the Delaware River and its watershed.

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Acronyms and Abbreviations

ABACT	Antidegradation Best Available Combination of Technologies
BCG	Biological Condition Gradient
BMP	Best Management Practice
CCC	Criteria Continuous Concentration
CMC	Criteria Maximum Concentration
CPMI	Coastal Plain Macroinvertebrate Index
CWA	Clean Water Act
CWF	Cold Water Fishery
DCNR	Department of Conservation and Natural Resources
DEP	Department of Environmental Protection
DER	Department of Environmental Resources
DRBC	Delaware Riverkeeper Basin Commission
DRN	Delaware Riverkeeper Network
EHB	Environmental Hearing Board
EPA	Environmental Protection Agency
EQB	Environmental Quality Board
ESA	Endangered Species Act
ESCGP	Erosion and Sediment Control General Permit
EV	Exceptional Value
GP	General Permit
HBI	Hildenhoff Biotic Index
HGMI	High Gradient Macroinvertebrate Index
HQ	High Quality
IBI	Index of Biotic Integrity
ICE	Instream Comprehensive Evaluation
LNG	Liquefied Natural Gas
MCL	Maximum Contaminant Level
MOA	Memorandum of Agreement
NPDES	National Pollutant Discharge Elimination System
PFBC	Pennsylvania Fish and Boat Commission
PMI	Pinelands Macroinvertebrate Index
SEJ	Social and Economic Justification
SFTF	Small Flow Treatment Facility
SSWAP	Statewide Surface Water Assessment Program
SWRC	Stroud Water Research Center
T&E	Threatened and Endangered
TMDL	Total Maximum Daily Load
TSF	Trout Stocking Fisher
UAA	Use Attainability analysis
WWF	Warm Water Fisher

Foreword

Our rivers, their tributaries and habitats are precious members of our communities. Once destroyed, they cannot be replaced; their beauty, value, and all they provide are lost to us and to all the generations that follow. In recognition of the value of clean waterways, federal regulations require every state to put forward policies and implement programs—referred to as antidegradation policies and programs—intended to prevent our waters from becoming polluted.

Federal policy first included antidegradation in 1968 (the policy was re-promulgated in 1975, then codified in 1988), but only now are some states enacting antidegradation policies and programs that comply with the federal regulations. Pennsylvania's antidegradation policies and program date back decades, but some states are taking action only now after having been forced to do so by legal action brought by private citizens and environmental organizations when the federal agency charged with enforcing the Clean Water Act, the U.S. Environmental Protection Agency (EPA), did not act.

Pennsylvania's antidegradation program was also subject to legal action. In the 1990's, private citizens and environmental organizations brought legal action to strengthen Pennsylvania's program and bring it into compliance with federal antidegradation policy: a 1993 lawsuit was brought to ensure that the program was stringent enough to meet federal standards; a 1996 lawsuit was brought to force the EPA to promulgate regulations when Pennsylvania did not act quickly to correct its program; and a second 1996 lawsuit was brought to force Pennsylvania to identify waters that did not meet water quality standards and to create regulations to address their pollution problems.

As the environmental community worked to ensure strong antidegradation protections, others sought to weaken them. After the EPA approved portions of Pennsylvania's revised antidegradation policy in March 2000, legislation was introduced in the Pennsylvania General Assembly in March 2001 to make it harder for streams to qualify for the highest level of protection provided under the antidegradation program. The legislation was unsuccessful, but was not the last assault on Pennsylvania's program. In 2009, the Department of Environmental Protection (the state agency charged with protecting Pennsylvania's streams) proposed revising erosion and sediment control regulations, rolling back protections for over 22,000 miles of Pennsylvania's cleanest streams. This, too, was ultimately unsuccessful.

To be a leader in antidegradation, Pennsylvania's policy and program must evolve to reflect the growing understanding of stream function and an appreciation of the benefits of stronger (not weaker) protections for our streams. Other states are considering, adopting, and/or implementing provisions that reflect improved understanding of river functions; that better recognize how what we do on the land affects water quality and quantity; that reflect the economic, environmental, health and community benefits of protecting clean water. Pennsylvania's antidegradation policy and program must continue to evolve, however it is largely unchanged since it was last revised in 2000.

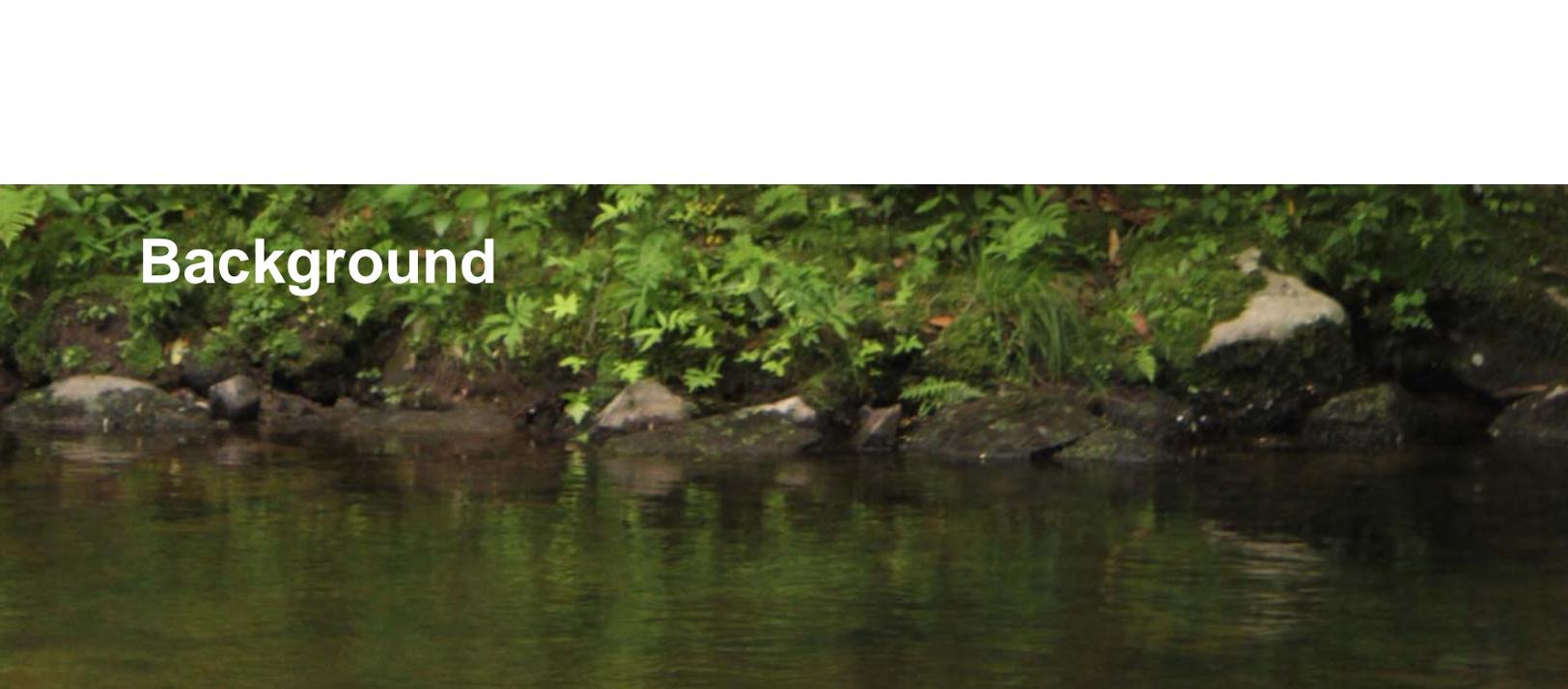
In 2007, the Delaware Riverkeeper Network began studying the components of Pennsylvania's antidegradation program that are intended to keep the Commonwealth's cleanest waters clean. This report provides background information on Pennsylvania's antidegradation policy and program, looks at the status of implementation, and provides suggestions for improvement. It is intended to begin a discussion and to inspire action that will strengthen the protections provided to our cleanest streams.



Maya K. van Rossum,
the Delaware Riverkeeper

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Background

Antidegradation Policy

The goal of the 1972 legislation that has come to be known as the Clean Water Act was to ensure that all waters would be fishable and swimmable within ten years, by 1983. The Clean Water Act also called for the elimination of pollution discharges to our nation's waters by 1985. Although they remain to be achieved, these goals underlie the systems of regulations that are in place to protect water quality across the country. The Clean Water Act requires each state to put forward an antidegradation policy and establish procedures to implement that policy.¹ In other words, each state must develop: 1) policies for keeping its waters clean, and 2) procedures to ensure that actions that could affect water quality—such as pollution discharges—will not degrade those waters.

Federal antidegradation regulations and policy² provide guidance and serve as a baseline for the policies and procedures that states must enact. States may adopt a more protective policy than federal regulations but, at a minimum, states are required to establish levels of protection consistent with federal regulations. These regulations present three levels, or tiers, of protection with increased protections for the higher tiers.

Tier 1 is the base or minimum level of protection applicable to all surface waters in the United States. Under Tier 1, existing uses³ must be maintained and protected. Existing uses are defined in federal regulations as “those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards.” The terms, fishable and swimmable, can be considered two very broad uses for waterways. For example, if a stream supported a cold water fishery on or after November 28, 1975, that use would need to be protected. Water quality in the stream would not be allowed to degrade to the point that a cold water fishery was not viable.

In federal antidegradation policy, Tier 2 applies to surface waters where water quality is better than Tier 1. Protections for Tier 2 are to be more stringent than for Tier 1. Tier 3 applies to surface waters that represent an outstanding national resource. For Tiers 1 and 2 some degradation may be allowed, but for Tier 3 surface waters absolutely no degradation is allowed.

¹ 40 C.F.R. §131.12. Antidegradation Policy.

² 40 C.F.R. §131.12. Antidegradation Policy.

³ 40 C.F.R. §131.3. Definitions.

Antidegradation policies are to be incorporated into or referenced by a state's water quality standards. A state's antidegradation program must be more than policy alone; it must include implementation procedures that ensure that each tier of waters receives the required level of protection. It should be noted that the EPA has provided guidance to states allowing them to consider some discharges as *de minimis* or insignificant, that such discharges may lower water quality somewhat but not significantly. The authority to identify some discharges as *de minimis* impacts allows states the opportunity to lessen the burden or permitting for Tier 2 or Tier 3 waters by identifying some impacts to be of little or no consequence.⁴ States are required to cap or consider cumulative effect of *de minimis* discharges to ensure that degradation of water quality does not occur.⁵

Federal antidegradation policy does not mandate one approach for assigning Tier 2 or Tier 3 streams. Two approaches that have been used by states for determining Tier 2 or Tier 3 designation are the pollutant-by-pollutant approach or the waterbody-by-waterbody approach.⁶ Under the pollutant-by-pollutant approach, which is favored by the EPA,⁷ the level of each pollutant of concern in the waterbody must be assessed and compared against a set standard. If the water quality of the assessed waterbody is better than the standard, the stream could be considered for Tier 2 or Tier 3 designation. Under the waterbody-by-waterbody approach, the overall health of a waterbody must be assessed. The waterbody-by-waterbody approach must consider and balance multiple aspects of water quality to determine whether a stream should be designated Tier 2 or Tier 3. Pennsylvania uses a waterbody-by-waterbody approach. A comparison of the pros and cons of pollutant-by-pollutant, waterbody-by-waterbody and hybrid classification schemes, prepared by the Idaho Department of Environmental Quality, is attached in Appendix B.

A Brief History of Water Quality Protection in Pennsylvania

In the 1886 Pennsylvania Supreme Court Case, *Pennsylvania Coal Company v. Sanderson*, the Court ruled that economic benefits were a public good that outweighed "the trifling inconvenience of particular persons" whose water was polluted.⁸ In this case, the public good was the economic benefits associated with coal mining and the trifling inconvenience was the pollution of one family's water supply with acid mine drainage. The *Sanderson* decision, which even at the time was considered contrary to settled law in other states,⁹ illustrates how protection of Pennsylvania's natural resources long took a back seat to the use and abuse of those resources in the guise of the protecting the common good.

⁴ Tetra Tech. 2007. Technical Memorandum # 2: Final Report Overview of State, Federal, and Judicial Guidance on Antidegradation. For Minnesota Pollution Control Agency. Retrieved from http://www.pca.state.mn.us/index.php/component/option,com_docman/task,doc_view/gid,6980.

⁵ King, Ephraim S. 2005. Memorandum: Tier 2 Antidegradation Reviews and Significance Thresholds. US Environmental Protection Agency. Retrieved from http://www.deq.idaho.gov/rules/water/58_0102_1001_ephram_king_memo.pdf.

⁶ US Environmental Protection Agency (EPA). 2010. Water Quality Handbook - Chapter 4: Antidegradation (40 CFR 131.12). Retrieved from <http://water.epa.gov/scitech/swguidance/waterquality/standards/handbook/chapter04.cfm>.

⁷ US EPA. 2010. Water Quality Handbook - Chapter 4: Antidegradation (40 CFR 131.12). Retrieved from <http://water.epa.gov/scitech/swguidance/waterquality/standards/handbook/chapter04.cfm>.

⁸ Miller, Randall M. and William Pencak, eds. 2001. Pennsylvania: A History of the Commonwealth. Pennsylvania Historical and Museums Commission. Harrisburg, PA.

⁹ Northeast Reporter, Volume 98. 1912. Containing all the Supreme Courts of Ohio, Illinois, Indiana, Massachusetts, Appellate Court of Indiana, and Appeals Court of New York, Apr 23 – July 30, 1912. West Publishing Company. Saint Paul, MN.

Pennsylvania's efforts to protect water quality go back decades,¹⁰ but those early regulations specifically exempted impacts from activities like coal mining. The Clean Streams Law, which was passed in 1937, remains at the heart of Pennsylvania's regulation of pollution discharges today. The scope of this regulation was broader than prior legislation intended to protect drinking water by also requiring protection of aquatic life. However, this earnest attempt to combat pollution and protect clean streams did not provide the level of protection one might have expected. Acid mine drainage was exempted from regulation until 1965.¹¹ Even the 1945 amendments to the Clean Streams Law allowed untreated sewage discharges to streams already polluted by acid mine drainage.¹²

In 1968, Pennsylvania's Sanitary Board adopted a policy requiring secondary treatment for all industrial wastes discharges, marking a significant step in efforts to keep streams clean. The 1970 creation of the Department of Environmental Resources (DER), formed through the consolidation of 17 pollution control/resource management agencies, boards and commissions, also marked a change in stream protection policies and procedures.

Although many states have been slow to establish antidegradation programs (with some only recently establishing their implementation procedures), the nascent DER undertook efforts to protect Pennsylvania's cleanest streams.¹³ Prior to the 1995 updates to Pennsylvania's antidegradation program, the DER was split into the Department of Environmental Protection (DEP) and the Department of Conservation and Natural Resources (DCNR).¹⁴ Responsibility for the antidegradation program remained with the DEP.

Evolution of Pennsylvania's Current Antidegradation Program

The U.S. Environmental Protection Agency (EPA), which was established in 1970, is charged with enforcing the Clean Water Act including the antidegradation regulations. The EPA must also approve all state antidegradation programs to ensure compliance with federal regulations. Pennsylvania's early effort had been approved by the EPA, but a 1993 lawsuit contending that the Commonwealth's antidegradation standards were less stringent than the minimum federal requirements forced the EPA to change its position.¹⁵ The EPA disapproved Pennsylvania's triennial review of its water quality standards in 1994. When Federal District Court, in response to a 1996 lawsuit, found that Pennsylvania did not revise its antidegradation policy in a timely manner, antidegradation regulations were proposed for Pennsylvania by the EPA.¹⁶

Pennsylvania put forward revisions in 1999 which were approved in part by the EPA in 2000, but the EPA withheld approval on Pennsylvania's policy on Tier 3 streams until the Commonwealth could

¹⁰ 29 Pa.B. 3720.

¹¹ Pennsylvania Department of Environmental Resources (PA DER). 1971. Final Report of the Pennsylvania Sanitary Water Board, 1923 – 1971, Publication Number 29. Retrieved from http://www.depweb.state.pa.us/portal/server.pt/gateway/PTARGS_6_2_97330_13897_588469_43/.

¹² Wagner, Seymour C. 1951. Stream Pollution Control. University of Pennsylvania Law Review, Vol. 100, No. 2:225-241. Retrieved from <http://www.jstor.org/stable/3310113>.

¹³ Tropea, Lawrence C. Jr. 19 July 2000. Protecting the Commonwealth's Waters. Testimony before the Pennsylvania House Resource and Energy Committee. Harrisburg, PA. Retrieved from <http://www.dep.state.pa.us/dep/deputate/watermgt/Wqp/WQStandards/antideg/LT-AntidegTstmy1.htm>.

¹⁴ Clean Streams Law, PL 1987, Act 394 of 1937, as amended.

¹⁵ Raymond Proffitt Foundation v. EPA, 930 F. Supp. 1088 (E.D.Pa.1996).

¹⁶ US EPA. 13 November 2009. Laws/Regulations, Pennsylvania: Water Quality Standards for Pennsylvania, Retrieved from <http://water.epa.gov/lawsregs/guidance/factpa.cfm>.

demonstrate that its implementation procedures afforded protection for these streams, referred to as Exceptional Value waters in Pennsylvania, and would be in compliance with federal regulations. EPA approved Pennsylvania's antidegradation program in 2007 after the finalization of its *Water Quality Antidegradation Implementation Guidance*.¹⁷ In response to the 2007 approval of Pennsylvania's antidegradation program, the EPA's final action in May 2010 withdrew federal antidegradation protections for Pennsylvania's waters, allowing the Commonwealth to implement its own antidegradation policy.¹⁸

Policy vs. Procedures

A policy presents a principle that serves to guide actions and decision making. A portion of Pennsylvania's antidegradation policy, often referred to as Special Protection Waters, can be found in the Pennsylvania Code in Title 25 Pa. Code §93.4a.¹⁹ For example, §93.4a(d) specifically presents Pennsylvania's policy regarding the protection of Tier 3 waters, referred to in Pennsylvania as Exceptional Value waters:

Protection for Exceptional Value Waters—The water quality of Exceptional Value Waters shall be maintained and protected.

By contrast, implementation procedures detail the methods that are to be applied to ensure the guiding principle of a given policy is achieved. An example of a procedure that Pennsylvania uses to implement its antidegradation policy can be found in Title 25 Pa. Code §93.4c(b)(1)(ii)(A):

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

More extensive procedures can also be found in *Water Quality Antidegradation Implementation Guidance* as well as documents²⁰ that address the permitting of discharges of pollutants to waters of the Commonwealth.

Pennsylvania's Antidegradation Program

What is water quality? The term "water quality" is often used to refer to the physical, chemical and biological characteristics of water. For scientific and legal purposes, water quality refers to the suitability of a waterway to support a particular use. Water quality may be suitable for some uses, but not for others. For example, water quality in a stream may be suitable for drinking, but not for swimming.

The protections provided by different use designations can be confusing to those unfamiliar with the interconnected regulatory framework underlying the system. For example, Clean Water Act protections assume a basic level of treatment for water with drinking water as a designated use.²¹ As a result, the

¹⁷ Withdrawal of Federal Antidegradation Policy for all Waters of the United States within the Commonwealth of Pennsylvania, 75 Federal Register 103 (28 May 2010), 29899-29901. Retrieved from <http://edocket.access.gpo.gov/2010/2010-12933.htm>.

¹⁸ Withdrawal of Federal Antidegradation Policy for all Waters of the United States within the Commonwealth of Pennsylvania. 75 Federal Register 103 (28 May 2010), 29899-29901. Retrieved from <http://edocket.access.gpo.gov/2010/2010-12933.htm>.

¹⁹ §93.4a. Antidegradation.

²⁰ See National Pollutant Discharge Elimination System (NPDES) permitting guidance available at <http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9450>.

²¹ River Network. n.d. Protecting the Most Sensitive Uses. n.d. Retrieved from <http://www.rivernetwork.org/content/wqs-sensitive-uses>.

permitting of a discharge to a stream with drinking water as a designated use will consider the treatment that water will undergo before it is consumed. However, if that stream's designated uses also include contact recreation such as swimming, more stringent limits might be placed upon the discharge to protect human health. The most sensitive use designations of a waterbody are required to be protected. A stream's aquatic life use designation will generally be the most sensitive use and therefore the most limiting factor in discharges to that stream.

The uses of Pennsylvania's surface waters²² were identified between 1966 and 1973, extensively reviewed in 1976, and then made final in 1979.²³ Regulations provide five categories of uses that break down as follows: Aquatic Life, Water Supply, Recreation and Fish, Special Protection, and Other. For each use, the water quality criteria are established. Water quality criteria, which can be either numeric (e.g., based on technological and/or biological data, such as "maximum concentration ten milligrams per liter") or narrative (e.g., "floating material, oil, grease, scum and substances which produce color, tastes, odors, turbidity or settle to form deposits"), are designed to protect a stream's designated use. Water quality criteria also form the basis for developing pollutant limits for permitted point discharges.

In Pennsylvania, Tier 1 is referred to as "Existing Use Protection." Under Existing Use Protection, no permitted activity (e.g., an effluent discharge under a National Pollutant Discharge Elimination System, or NPDES, permit) may cause a waterbody to deteriorate to the degree it would no longer support its current use designations, such as Cold Water Fishery or Potable Water Supply.²⁴

Where water quality is better than applicable water quality criteria, that water quality is said to be "locked in"²⁵ and should never be reduced below the criteria necessary for it to sustain its current use designations. For example, on a waterbody with a designated use of Cold Water Fishery, should a proposed NPDES discharge permit be likely to degrade water quality to the extent that the Cold Water Fishery designation could not be supported, the proposed discharge would not be permitted.

Existing Uses are defined in Title 25 Pa. Code §93 as "[t]hose uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards." Pennsylvania recognizes that a stream may have attained uses that require more stringent water quality criteria than the designated use would afford. When this occurs, those attained uses—referred to as "Existing Uses"—are to be protected and supersede the designated use. DEP maintains an "Existing Uses List" on its website that can be accessed through a link on the Statewide Existing Use Classifications webpage of the Division of Water Quality Standards, Bureau of Water Standards and Facility Regulation: <http://www.portal.state.pa.us/portal/server.pt?open=514&objID=553974&mode=2>. Only when a stream's existing use is demonstrated to be better than its designated uses will it be placed on the Existing Uses List.²⁶ When existing water quality is below that needed to meet the designated

²² §93.3. Protected Water Uses.

²³ Pennsylvania Department of Environmental Protection (PA DEP). 1999. Continuing Planning Process for Water Quality Management. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Version-48379/394-0810-001.pdf>.

²⁴ PA DEP. 2003. Water Quality Antidegradation Implementation Guidance. 2003. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-47704/391-0300-002.pdf>.

²⁵ §93.4a(b)-(d). Antidegradation Requirements.

²⁶ PA DEP. 2010. Table I: Existing Use Classification. Retrieved from <http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Existing%20Use/EU%20table%20list.pdf>.

uses, the designated uses becomes the desired uses, or the water quality goals, for that stream segment and the stream needs to be cleaned-up.²⁷

The Existing Uses List status, as applied by Pennsylvania, can afford interim protection to streams that are found to have better water quality than their official designated uses. In Pennsylvania, changing a stream’s designation requires rulemaking which can be a slow, often multi-year process. Existing Uses List status helps to achieve the goals of antidegradation by preventing degradation of streams that have better water quality than their designation prior to completion of rulemaking. Interim stream protection via the Existing Uses List appears to be unique to Pennsylvania’s antidegradation program (DEP staff, Personal communication, 16 June 2011)²⁸. When activities requiring a permit are considered, DEP permitting staff are to refer to the Existing Uses Table to make sure the correct designations are being protected.

In Pennsylvania, Tier 2, or High Quality (HQ) waters, requires maintenance and protection of water quality unless degradation is necessary to accommodate “important social or economic development,”—development that must be demonstrated through a process known as a Social and Economic Justification (SEJ). The SEJ process requires full satisfaction of intergovernmental coordination and public participation. A reduction in water quality may be allowed to accommodate a SEJ, but both existing and designated uses, other than the HQ designated use, must remain protected (SEJ will be discussed in more detail on pp. 18-19).

Tier 3, referred to as Exceptional Value (EV) waters in Pennsylvania, is the most stringent. Absolutely no degradation is permitted in a stream designated EV. Streams with this designation are the “Outstanding National Resource Waters” established by the Clean Water Act. Proposals for new or expanded discharges to EV streams must preserve water quality and will likely require a higher level of treatment.²⁹

TIER I:	TIER II:	TIER III:
Protect Existing Use	Maintain "High Quality" Waters:	Protect "outstanding" waters:
Permit no activity that would eliminate or interfere with an existing use. (In essence, Tier 1 reiterates and reinforces the requirements for designating uses and developing criteria, establishing the absolute floor for water quality protection.)	Avoid--or at least hold to an absolute minimum--any lowering of quality of waters that currently meet or exceed standards.	Give the most ecologically significant and sensitive, the cleanest, and the most recreationally popular waters the strict protection they need and deserve.

Table 1: Tiers of Water Quality Protection (River Network)³⁰

²⁷ When a stream is impaired, the clean-up process involves the development of a total maximum daily load (TMDL) for the pollutant causing the impairment. A one page overview explaining TMDLs and how they are used to clean up streams is available from the Delaware River Basin Commission, <http://www.state.nj.us/drbc/TMDL.pdf>.

²⁸ PA DEP sources are not identified by name to protect them against potential reprisals for disclosing information to DRN.

²⁹ For a detailed discussion of the effects of HQ or EV designation on specific projects or activities, see the Pennsylvania Campaign for Clean Water’s 2007 publication, *The Effects of Special Protection Designation: A Guide for Communities*. Available from www.cbf.org/Document.Doc?id=255.

³⁰ River Network. 1999. Table Excerpted from: *Understanding the Clean Water Act. Antidegradation: Protecting Existing Water Quality*. Retrieved from.

Assessing Pennsylvania Streams for Special Protection under Antidegradation

Pennsylvania employs a waterbody-by-waterbody approach for determining a stream's designated use. The adoption of this approach dates to the late 1960's when "conservation areas" were identified as the basis for assigning HQ and EV protections to many streams (PA DEP staff, Personal Communication, 9 September 2010). One of the advantages of the waterbody-by-waterbody approach is considered to be the resulting list of protected waters that can be developed.³¹

Although Pennsylvania's list of waters indicating designated uses was officially finalized in 1979,³² use designations may be changed through a rulemaking process that must go before the Environmental Quality Board (EQB), a 20-member panel that is responsible for adopting regulations for the DEP.³³ Under Pennsylvania's antidegradation program, anyone may submit a petition requesting a stream's designated use be changed.³⁴ Generally, these petitions request an upgrade in a stream's designation (e.g., from Cold Water Fishery to HQ-Cold Water Fishery or to EV), but petitions for lowering a stream's designation are also considered. As previously noted, designated uses—whether attained or not—are supposed to be the protected uses, however federal antidegradation policy allows for, and the EQB has approved, downgrades for waterways in certain circumstances,^{35,36,37} such as where the use was considered to be unattainable.

After the EQB accepts a petition for a stream use redesignation, DEP must undertake an assessment to study that stream's ability to meet or exceed selection criteria for HQ or EV designation. When Pennsylvania put forward its revised antidegradation policy and program in 1999, it revised completely the selection criteria for qualifying as HQ or EV waters.³⁸ Candidate waters must meet or exceed specific chemical or biological benchmarks to achieve a use designation. Although both chemical and biological data can be examined, a stream need not meet both specified chemical and biological thresholds to achieve an upgraded use designation. Should the chemical and biological data be in conflict, the data will undergo review and verification, but ultimately if either the water chemistry data or the stream biology data meets or exceeds the specified threshold put forward in 93.4b, the stream will qualify for an upgraded and more protective designation.³⁹

³¹ Idaho Department of Environmental Quality. 2010. Idaho Antidegradation Implementation Discussion Paper: Waterbody-by-Waterbody or Pollutant-by-Pollutant. Retrieved from http://www.deq.idaho.gov/rules/water/58_0102_1001_discussion_paper.pdf.

³² PA DEP. 1999. Continuing Planning Process for Water Quality Management. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Version-48379/394-0810-001.pdf>.

³³ PA DEP. 2010. What is the Environmental Quality Board? Retrieved from http://www.portal.state.pa.us/portal/server.pt/community/environmental_quality_board/14005/what_is_the_environmental_quality_board_/589176.

³⁴ §93.4d. Processing of petitions, evaluations and assessments to change a designated use.

³⁵ 40 C.F.R. §131.10(g). Antidegradation Policy.

³⁶ PA DEP. 2006. Water Quality Standards Review Stream Redesignation Evaluation: Clarion River. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/Big%20Brook/Clarion%20River.pdf.

³⁷ PA DEP. 2002. Water Quality Standards Review Stream Redesignation Evaluation: East Branch Codorous Creek. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/Browns%20Run/East_Branch_Codorus_Creek.pdf.

³⁸ 29 Pa.B. 3720.

³⁹ PA DEP. 2003. Water Quality Antidegradation Implementation Guidance. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-47704/391-0300-002.pdf>.

The DEP is charged with undertaking the antidegradation assessment, or Aquatic Life Special Water Quality Protection Survey, of streams proposed for redesignation.⁴⁰ A waterbody-by-waterbody approach generally relies on a biological assessment to characterize the overall health of the stream. The assessment protocols that DEP currently follows for collecting stream data for redesignation are detailed in Chapter 5 of Pennsylvania's *Water Quality Antidegradation Implementation Guidance*. Even before the formal adoption of its antidegradation guidance, biological assessments had become the focus of DEP water quality assessments (PA DEP staff, Personal Communication, 9 September 2010). Since the adoption of Pennsylvania's 1999 antidegradation revisions, evaluation of stream health has focused primarily on biological assessment methods in keeping with its waterbody-by-waterbody approach out of recognition that physical and chemical conditions of a surface water can also be accurately characterized by the assemblage of aquatic organisms present in the stream.

DEP assessment protocols for Aquatic Life Special Water Quality Protection Survey (or more briefly, special protection surveys) currently follow the EPA's Rapid Bioassessment Protocols,⁴¹ however Pennsylvania's 1999 antidegradation policy revisions included flexibility to utilize other widely accepted and published peer-reviewed biological assessment procedures. At this time, when DEP conducts a stream assessment,⁴² it analyzes the populations of aquatic insects collected with an Index of Biotic Integrity (IBI), a tool that combines multiple metrics of aquatic organisms. The IBI results in a score from zero to 100; the higher the score, the healthier the stream.⁴³

For special protection surveys, the score of a stream that is a candidate for upgrade redesignation are compared to score for a reference stream. To attain an HQ designation, the candidate stream must score greater than or equal to 83% of the score for the reference stream. To attain an EV classification, the candidate stream must score greater than or equal to 92% of the score for the reference stream.⁴⁴

In addition to achieving an IBI score equal to or greater than 92% of the reference stream, the EV designation can be achieved by satisfying one or more of the following criteria:

- Location in a National wildlife refuge or a State game propagation and protection area.
- Location in a designated State park natural area or State forest natural area, National natural landmark, Federal or State wild river, Federal wilderness area or National recreational area.
- Qualification as an Outstanding National, State, regional or local resource water.⁴⁵

⁴⁰ Agricultural Advisory Board. 18 October 2006. Minutes. Harrisburg, PA. Retrieved from http://www.dep.state.pa.us/dep/subject/advoun/ag/2006/December2006/10_18_06AABMinutes.doc.

⁴¹ US EPA. 1989. Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish.

⁴² In addition to special protection surveys, DEP also conducts stream assessments for impairment assessments and integrated stream listing purposes. For impairment assessments and integrated stream listing purposes, DEP has begun utilizing a Biological Condition Gradient approach. Instead of comparing the IBI score to a reference stream, the score is compared against a gradient from zero to 100, upon which thresholds, or benchmarks, have been established for aquatic life use attainment levels.

⁴³ PA DEP. 2009. A Benthic Index of Biotic Integrity for Wadeable Freestone River-Run Streams in Pennsylvania. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/ibi_rifflerun2009.pdf.

⁴⁴ PA DEP. 2003. Water Quality Antidegradation Implementation Guidance. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-47704/391-0300-002.pdf>.

⁴⁵ These criteria were the basis of a petition by North Pocono Citizens Alert Regarding the Environment requesting an upgrade of the Upper Lehigh River. The DEP report detailing its evaluation of the Upper Lehigh can be found at: http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/Fishing%20Creek/Upper_Lehigh_River_Report.pdf.

- Be a surface water of exceptional recreational significance.⁴⁶
- Designation as a “wilderness trout stream” by the Pennsylvania Fish and Boat Commission (PFBC) following public notice and comment.

Surface waters of “exceptional ecological significance” are also eligible for EV designation. These are waters that are determined to be “important, unique, or sensitive ecologically” regardless of whether the chemical or biological data meet or exceed the criteria for HQ designation. Two such types of surface waters of “exceptional ecological significance” are thermal springs and those wetlands considered to be exceptional value wetlands under §105.17(1).⁴⁷

Once DEP has conducted its own assessment and determined a water’s eligibility for the special protections afforded under the antidegradation program, DEP will make a recommendation to the EQB. If approved by the EQB, the redesignation is made official through rulemaking. Because the process of making the redesignation official can often span years, DEP will add the waterway to the Existing Uses List when the recommended designated use would be more protective than the current designated use in order to ensure protection prior to completion of rulemaking.⁴⁸

Antidegradation by the Numbers

Pennsylvania, with less than 45,000 square miles of land area, boasts more than 86,000 miles of streams and rivers.⁴⁹ DEP estimates about 27% or 22,563 miles of Pennsylvania’s stream have received the HQ designation.⁵⁰ About four percent or only 3,076 miles of the Pennsylvania’s streams have been received the EV designation.⁵¹ For comparison, New Jersey, with 8,919 square miles of land area, has 18,126 miles of streams and rivers, over 69,825 acres of lakes, ponds and reservoirs, and 260 square miles of estuary.⁵² In New Jersey, all surface waters are protected under that state’s antidegradation program with a Tier 2, Tier 2.5 or Tier 3 designation.⁵³

DEP conducts stream use designation evaluations on an ongoing basis. Evaluations may be conducted on streams or stream segments that are found to be missing from the water quality standards⁵⁴ or on streams or segments DEP believes to be improperly classified. Redesignation evaluations may also be

⁴⁶ Definitions provided in §93.1 further clarify this as a surface water that provides a water-based, water quality-dependent recreational opportunity, such as fishing for species with limited distribution.

⁴⁷ The North Pocono CARE petition for the Upper Lehigh River included are a request for consideration of the ten ecologically significant wetland areas present including one wetland community type representing the only known occurrence in Pennsylvania.

⁴⁸ For a step by step guide to upgrading stream designation to HQ or EV, see Penn Future’s recently updated Stream Redesignation Handbook, available at <http://www.pennfuture.org/UserFiles/PDFs/PennFutureStreamHndbk09.pdf>.

⁴⁹ PA DEP. 2010. 2010 Pennsylvania Integrated Water Quality Monitoring and Assessment Report. Retrieved from <http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/2010%20Integrated%20List/Narrative/2010%20Pennsylvania%20Integrated%20Water%20Quality%20Monitoring%20and%20...pdf>.

⁵⁰ Stroud Water Research Center. 2009. Understanding Stream Conditions: Lessons from an 11-Year Study of Macroinvertebrates in Eastern Pennsylvania’s Schuylkill River Watershed, with a Focus on Exceptional-Value and High-Quality Streams. Retrieved from http://www.stroudcenter.org/schuylkill/Schuylkill_Summary.pdf.

⁵¹ Stroud Water Research Center. 2009. Understanding Stream Conditions: Lessons from an 11-Year Study of Macroinvertebrates in Eastern Pennsylvania’s Schuylkill River Watershed, with a Focus on Exceptional-Value and High-Quality Streams. Retrieved from http://www.stroudcenter.org/schuylkill/Schuylkill_Summary.pdf.

⁵² Hammond, Debra. 11 June, 2008. Category One Waters. Presentation to New Jersey Water Monitoring Council Meeting. Retrieved from <http://www.state.nj.us/dep/wms/NJDEP%20-%20antideg-process.pdf>.

⁵³ New Jersey Department of Environmental Protection. 2006. New Jersey Integrated Water Quality Monitoring and Assessment Report. Retrieved from <http://www.state.nj.us/dep/wms/bwqsa/docs/2006Chapter1.pdf>.

⁵⁴ §93.9. Designated water uses and water quality criteria.

conducted at the request of the PFBC. In addition, any person, agency, group, organization, municipality, or industry may submit a rulemaking petition to the EQB to request a stream redesignation and in Pennsylvania, many watershed groups and environmental organizations have done this when they have found evidence that a stream may have better water quality than its current designation. Conversely, dischargers and mining companies have also submitted petitions for downgrades generally asserting a stream has been wrongly designated or that the designated use cannot be achieved.

Requirements for Discharges to High Quality and/or Exceptional Value Waters

Pennsylvania's *Water Quality Antidegradation Implementation Guidance* lays out a decision-making process for when new, additional, or increased point source discharges are proposed for HQ or EV waters. Discharges that existed before the HQ or EV designation are grandfathered and are not required to comply with the more stringent antidegradation regulations, unless they want to increase their discharges.

When a discharge to an HQ or EV water is proposed, a special pre-permit analysis, called a nondischarge alternatives analysis, is required. During this analysis, nondischarge alternatives to the new, additional, or increased point source discharges are to be identified. Nondischarge alternatives recommended in Pennsylvania's *Water Quality Antidegradation Implementation Guidance* include: pollution prevention and process changes, alternative siting, land application of wastewater, recycle reuse of wastewater, alternative discharge locations.

A test for non-degradation is to be conducted simultaneously with the nondischarge alternatives analysis. Pennsylvania's *Water Quality Antidegradation Implementation Guidance* lays out a two-part evaluation procedure for DEP staff to employ in order to determine whether a proposed discharge can be considered to be non-degrading. This evaluation procedure relies on modeling of the pollutant of concern and on subjective factors that include the nature of the pollutants, treatment reliability, discharge duration, as well as physical and/or location concerns.

As described in Pennsylvania's *Water Quality Antidegradation Implementation Guidance*, the test for non-degradation was established in keeping with EPA's *de minimis* guidance for insignificant impacts,⁵⁵ and utilizes the concept of "assimilative capacity" which is defined by the EPA as the capacity of a stream "to receive wastewaters or toxic materials without deleterious effects and without damage to aquatic life or humans who consume the water."⁵⁶ This capacity, which has been termed a valuable natural resource,⁵⁷ is central to DEP's non-degradation test. DEP has established baseline water quality objectives for HQ and EV waters for a number of parameters and models water quality to determine assimilative capacity for waters state-wide. These values are used for all HQ or EV streams unless site-specific data are available.

A proposed discharge is evaluated by DEP staff and, as long as it does not exceed the criteria established for consumption of assimilative capacity, and all subjective factors are acceptable, the discharge will be

⁵⁵ PA DEP. 2003. *Water Quality Antidegradation Implementation Guidance*. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-47704/391-0300-002.pdf>.

⁵⁶ US EPA. 30 March 2011. *Terms of Environment: Glossary, Abbreviations and Acronyms*. Retrieved from <http://www.epa.gov/OCEPAterms/aterms.html>.

⁵⁷ King, Ephraim S. 2005. *Memorandum: Tier 2 Antidegradation Reviews and Significance Thresholds*. US Environmental Protection Agency. Retrieved from http://www.deq.idaho.gov/rules/water/58_0102_1001_ephram_king_memo.pdf.

considered non-degrading. When a proposed discharge is not the only source of a given pollutant to an HQ or EV stream, DEP may require a study of the cumulative impact of all sources on the stream. Importantly, if the proposed discharge is considered to be non-degrading under this test, DEP will allow these so-called non-degrading discharges not only in HQ waters but also in EV waters.

When a proposed discharge to an HQ or EV water is found to exceed the criteria established for consumption of assimilative capacity (in other words, the proposed discharge would degrade water quality and affect the water's ability to support its designated uses), or the subjective factors are not acceptable, the applicant can pursue a nondischarge alternative instead.

The cost-effectiveness of nondischarge alternatives are evaluated using the effluent limits that DEP's Division of Water Quality Standards has determined are necessary to protect all of the receiving stream's designated uses, including the HQ or EV uses. When cost-effective and environmentally sound alternatives to a stream discharge can be identified, they must be employed.⁵⁸ However, even when a proposed discharge to an HQ or EV water is found to exceed the criteria established for consumption of assimilative capacity and/or the subjective factors are not acceptable, and no cost-effective and environmentally sound nondischarge alternatives have been identified, this does not mean a proposed discharge will be denied a permit.

A proposed discharge that did not pass the non-degradation test may employ antidegradation best available combination of technologies (ABACT) to achieve approval as a non-degrading discharge. ABACT technologies are detailed in four appendices to Pennsylvania's *Water Quality Antidegradation Implementation Guidance*; Examples of ABACT include: Land application (Wastewater Discharges); Containment/collection of leachate or wastewaters generated with transport for disposal off-site (Waste Management Activities); Installation of upslope diversions near the area to be disturbed to minimize the amount of water entering the site (Mining Activities) and Deep well injection (Oil and Gas Activities).

No degradation of water quality is allowed in EV waters. However, the DEP may ultimately allow a reduction in water quality in an HQ waterway if it is considered necessary for important social or economic development (e.g., correcting existing public health or pollution hazards). This is referred to as the social or economic justification (SEJ).

Before DEP can allow the degradation of water quality in an HQ waterway, a SEJ ruling must be made. To secure a SEJ ruling, DEP must evaluate potential impacts of the proposed degrading discharge, balancing the asserted benefits that would result from the proposed social or economic development against the degree of water quality degradation and impact to existing and designated uses that would result from the proposed discharge. If a discharge is approved under these criteria, a stream discharge would result, but it will be a discharge that is subject to more stringent effluent limits intended to protect the water quality of HQ waterways.

⁵⁸ River Network and the Environmental Law and Policy Center report that nondischarge alternatives analysis are rarely being undertaken and require better structure in order to provide more useful alternative to stream discharges. For more information, see Frey, Merritt and Brad Klein, May 2009. Conducting a Meaningful, Efficient Antidegradation Alternatives Analysis: A Road Map. Paper Presented at River Rally, Baltimore, MD. Retrieved from http://projects.ch2m.com/cwqf/Workgroups/Content/Standards/docs/Antideg_Alts_Analysis_Roadmap.pdf.

It is important to stress that if DEP has determined a proposed discharge to be non-degrading under either the non-degradation test or through the use of ABACT, the agency will permit that discharge to either an HQ or EV receiving stream, without going through the SEJ process, as the proposed discharge is considered to be in compliance with antidegradation policy to maintain and protect water quality and existing and designated uses.

Pennsylvania's *Water Quality Antidegradation Implementation Guidance* describes factors to be considered in balancing the benefits of a proposed discharge against the costs to water quality, and lays out review and decision responsibility for which DEP staff will make SEJ determinations. For discharges administered under DEP's Water Management Program, a statewide SEJ review team is specified. Proposals for discharges in support of oil and gas well operations that are submitted for SEJ review are reviewed by DEP staff in the Bureau of Oil and Gas Management, in consultation with DEP's Regional Water Quality Manager. Proposals for mining discharges that are submitted for SEJ review are assigned to DEP staff in regional District Mining Offices, in consultation with DEP's Regional Water Quality Manager.

Under a SEJ ruling, a discharge to an HQ water that would degrade water quality may be allowed by DEP in order to accommodate important social or economic development if the discharger can demonstrate that the stream will continue to support all existing and designated uses other than the HQ designation. When such a degrading discharge is approved for an HQ water under SEJ, the numeric and general narrative water quality criteria found in Chapter 93 of DEP regulations and the toxic substances criteria found in Chapter 16, Toxics Management Strategy - Statement of Policy are to be applied.⁵⁹

⁵⁹ PA DEP. 2003. Water Quality Antidegradation Implementation Guidance. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-47704/391-0300-002.pdf>.



Status of Antidegradation Implementation in Pennsylvania

The Delaware Riverkeeper Network (DRN) set out to better understand how well Pennsylvania's antidegradation program, as described above, is serving to protect our cleanest streams in practice. To this end, we undertook a review of different aspects of Pennsylvania's program that we believe may serve as measures of the effectiveness: the protocol used for special protection surveys; the stream redesignation process; permitting of new discharges to HQ or EV waters; SEJ reviews; and trends in stream health in an EV stream.

Review: DEP's Monitoring Protocol

Prior to 1996, Pennsylvania had not assessed its waterways as required by Section 303(d) of the Clean Water Act, but a lawsuit brought that year by DRN, in partnership with and as a then affiliate of the American Littoral Society, forced the EPA to address this outstanding need as well as other unmet needs of the Clean Water Act.⁶⁰ As part of the 1997 settlement of the lawsuit, DEP committed to evaluating unassessed wadeable streams within ten years.⁶¹ By 2007, DEP reported it had completed assessments on all Pennsylvania's streams. This ten-year project was known as the Statewide Surface Water Assessment Program (SSWAP) which employed a single rapid and consistent technique.⁶²

SSWAP methodology, which utilized indicators suited to each water resource type, relied heavily on benthic macroinvertebrates considered to be well suited for assessing targeted aquatic life and special protection uses. Impairment assessments, which study the extent of negative impacts on streams, utilized family-level identification. Antidegradation assessments, also referred to as special protection surveys, undertaken to identify and protect Pennsylvania's cleanest streams utilized genus-level, rapid bioassessment protocol based on macroinvertebrate sampling and metric index-based analysis method.⁶³

⁶⁰ American Littoral Society, et al. v. EPA, No. 96-489 (E.D. Pa.).

⁶¹ PA DEP. 1996. Pennsylvania DEP, EPA Reach Agreement to Address Impaired Waters. Retrieved from http://www.dep.state.pa.us/dep/deputate/polycomm/pressrel/97/97_4_15_16_11_43.htm.

⁶² PA DEP. 2008. 2008 Pennsylvania Integrated Water Quality, Monitoring and Assessment Report. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/2008%20Integrated%20List/2008integratdlistnarrativessecondreviewupdatedaug4_2008.pdf.

⁶³ PA DEP. 2005. Elements of Pennsylvania's Monitoring and Assessment Program. Retrieved from http://www.epa.gov/reg3wapd/monitor/pdf/pa_strategy.pdf.

The SSWAP methodology, which allowed DEP to accomplish mandated stream monitoring, replaced earlier stream assessment methods that relied on best professional judgment, but lacked a mechanism to ensure consistent assessment decision-making across the state and over time. As data from stream surveys were amassed over the 10-year period of the SSWAP, DEP determined that its sampling methodology and biological metrics could be improved. DEP considered the SSWAP biological screening protocol to be effective for impairment assessments for most streams, but that more rigorous sampling and analysis methods were necessary for special protection surveys and for assessing impaired streams.⁶⁴ As a result, assessment procedures and implementation guidance were revised.

SSWAP is now being replaced by the Instream Comprehensive Evaluation, or ICE, program which will look at water chemistry as well as aquatic life and physical habitat.⁶⁵ The ICE protocol consists of biological sampling, lab processing, and data analysis guidance. The biological sampling and lab processing components of ICE are identical for impairment assessment determinations and special protection surveys, but the data interpretation guidance will vary for EV and HQ streams and is still being considered by the Department (PA DEP staff, Personal Communication, 16 July 2009).

For the ICE data analysis guidance, DEP biologists developed a tool, an index of biotic integrity (IBI), to quantify the health of all of Pennsylvania's wadeable, freestone, riffle-run type streams in response to ecosystem stressors. The IBI developed by DEP combines the results of six biological measures to determine a score to be used for assessing stream health. Although other states have established multiple IBIs specific to their different ecoregions, DEP opted not to develop IBIs specific to Pennsylvania's nine Level III ecoregions.⁶⁶

As of the date of this publication, special protection surveys continue to compare candidate streams to reference streams to determine eligibility for HQ or EV status. In the future, DEP may propose new regulations to implement the ICE data analysis guidance for stream redesignations, but such a proposal would first have to go through public review.

By contrast, waters being assessed for impairment are not compared to a reference stream, but are scored against a biological condition gradient (BCG). A BCG is a descriptive model that can be used to characterize an ecosystem's biological response to environmental stressors. Tiers or categories are described for each state along a BCG from pristine to degraded. Category descriptions, to be crafted by trained biologists, include characteristics such as the presence or absence of indicator species. Thresholds or benchmarks are then established along the BCG to assign a determination of impairment or non-impairment.

⁶⁴ PA DEP. 2005. Elements of Pennsylvania's Monitoring and Assessment Program. 2005. Retrieved from http://www.epa.gov/reg3wapd/monitor/pdf/pa_strategy.pdf.

⁶⁵ PA DEP. 2009.. Commonwealth of Pennsylvania Assessment and Listing Methodology for Integrated Water Quality Monitoring and Assessment Reporting, Clean Water Act Sections 305(b)/303(d). Retrieved from http://www.portal.state.pa.us/portal/server.pt/community/water_quality_standards/10556/2009_assessment_methodology/66876.

⁶⁶ US EPA. 2003. Ecoregions of EPA Region 3: Delaware, Maryland, Pennsylvania, Virginia, and West Virginia. Retrieved from http://www.epa.gov/wed/pages/ecoregions/reg3_eco.htm.

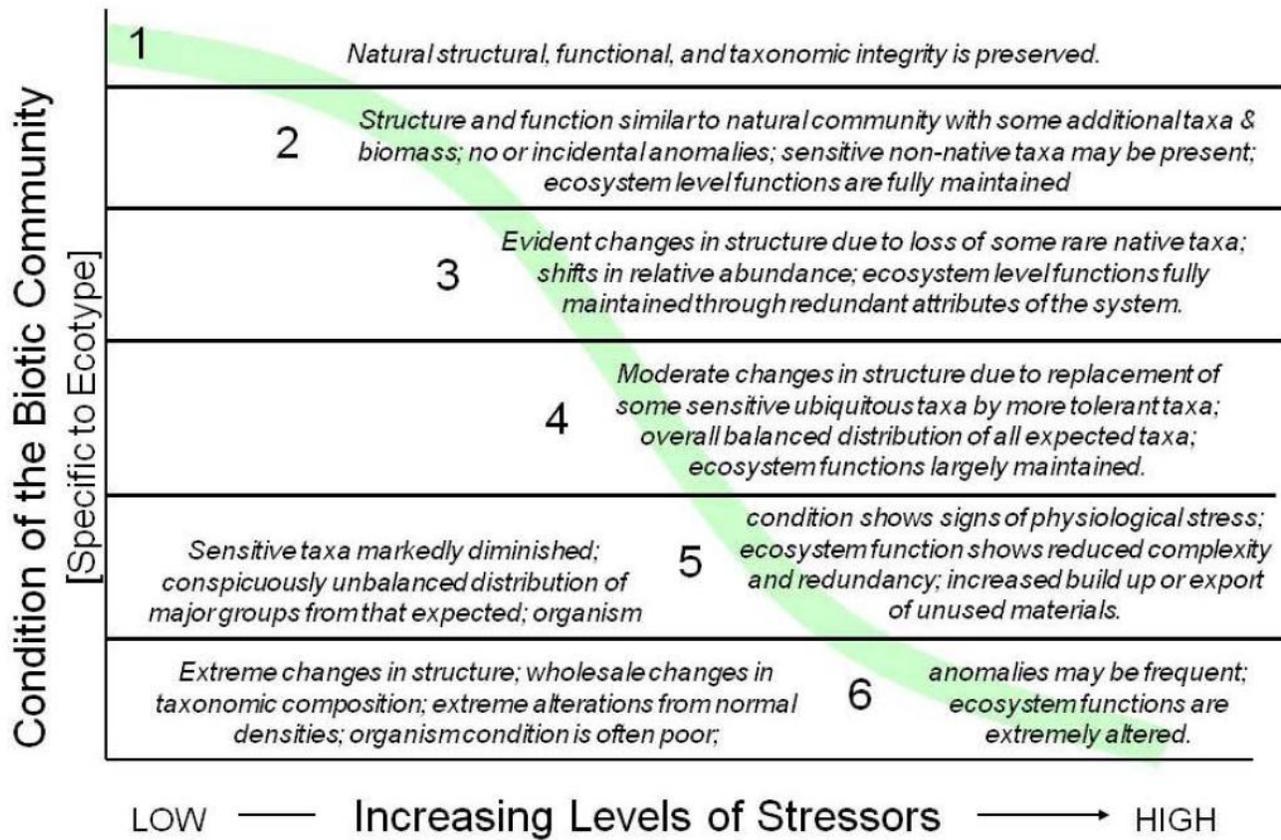


Figure 1: Conceptual model of the Biological Condition Gradient (US EPA)⁶⁷

⁶⁷ US EPA. 2011. Identifying and Protecting Healthy Watersheds: Concepts, Assessments, and Management Approaches (DRAFT). Retrieved from http://water.epa.gov/polwaste/nps/watershed/upload/complete_033111_final_low.pdf.

A discussion on the comparison of IBI scores against the BCG benchmarks developed by DEP is included in DEP's *A Benthic Index of Biotic Integrity (IBI) for Wadeable Freestone Riffle-Run Streams in Pennsylvania*, drafted in April 2009.⁶⁸ The diagram below illustrates the process.

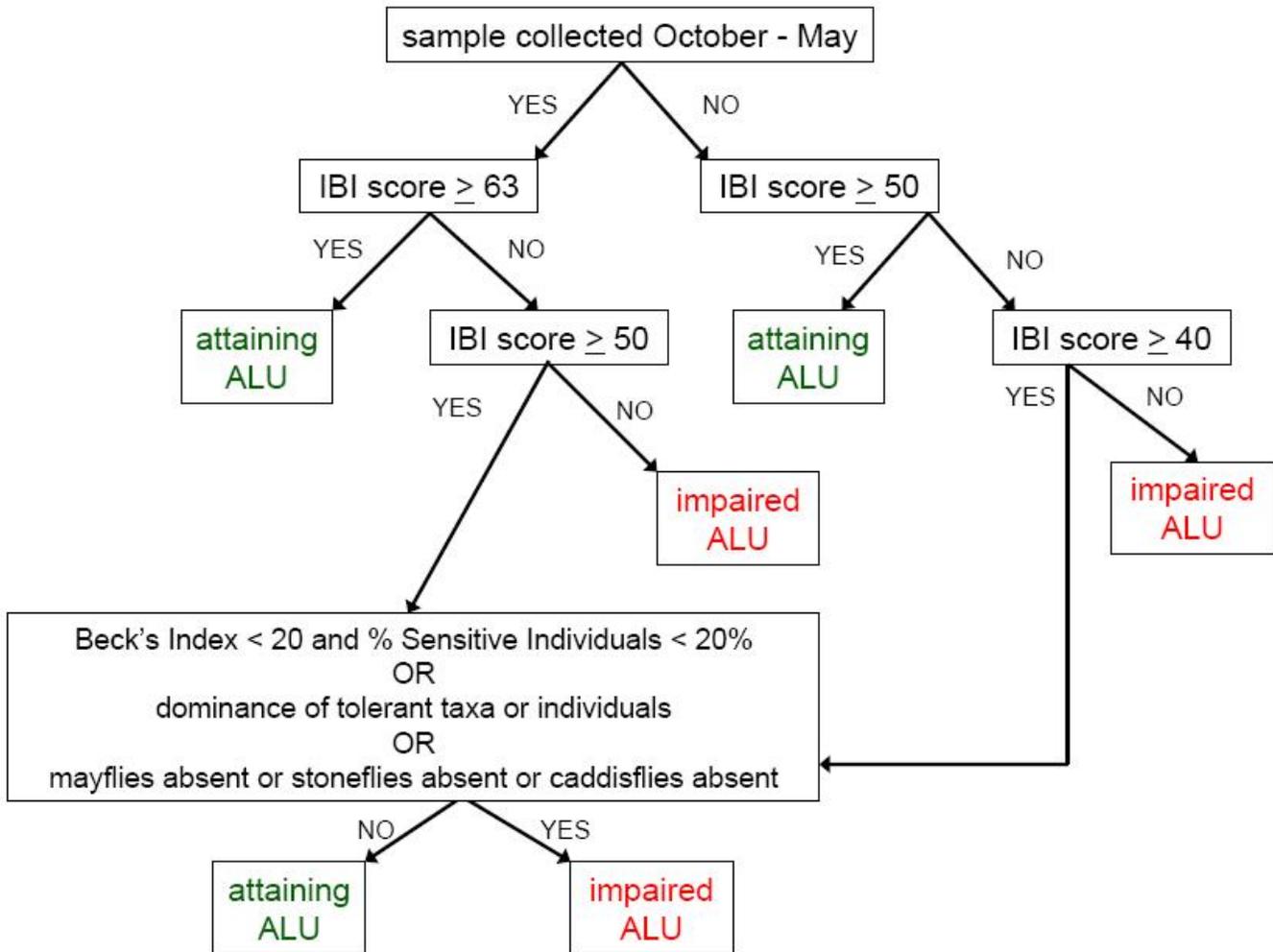


Figure 2: Pennsylvania's Aquatic Life Use Benchmarks⁶⁹

Although they are not being used for special protection surveys at this time, the aquatic life use thresholds developed by DEP for use as BCG benchmarks, along with the agency's data analysis guidance, do have implications for assessing whether an HQ or EV stream is degrading over time. When data from the EV-designated Crum Creek, collected using sampling protocols identical to antidegradation surveys conducted by DEP in recent years, were compared against DEP's BCG benchmarks, the stream's low score indicated impairment and a shift in aquatic communities since the

⁶⁸ PA DEP. 2009. Survey Protocol: Instream Comprehensive Evaluation Surveys. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Methodology/ice_2009am.pdf.

⁶⁹ PA DEP. 2009. Survey Protocol: Instream Comprehensive Evaluation Surveys. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Methodology/ice_2009am.pdf.

stream EV status was finalized in 2004.⁷⁰ Review of the BCG suggest that it will be necessary to establish regional benchmarks to assure that streams located in Pennsylvania's nine different ecoregions are not scored unfairly against a single, inadequate set of benchmarks. DEP has recognized the need for regional benchmarks although development of regional benchmarks is not moving forward at this time (PA DEP staff, Personal Communication, 9 July 2009).

Review: Stream Redesignation Process

DRN reviewed the most recently updated *Ongoing Stream Redesignation Evaluations Report* table⁷¹ (current as of September 27, 2010) as well as the most recent *Existing Use Classification Table*,⁷² which is used to provide interim protection to a stream found to have better water quality than its current designation, (current as of December 8, 2010) to determine the status of streams accepted by the EQB for a change in designation.

Petitions for stream upgrades—to secure for streams the special protections available under the antidegradation program—have been submitted to the EQB by local watershed groups, PFBC, and individual citizens. Petitions have also been submitted to lower a stream's designation. Such was the case for Hammer Creek in Heidelberg Township, Lebanon County, where the Township petitioned DEP in 2003 to lower the designation of the Hammer Creek basin from HQ-Cold Water Fishery to Trout Stocking Fishery. The Township alleged that the stream was improperly classified when it was designated a Conservation Area in 1979, the status that resulted in the HQ-Cold Water Fishery designation. The Chesapeake Bay Foundation challenged DEP's initial findings in the June 2007 report for Hammer Creek and DEP released a revised report in June 2008. DEP's report, based on modeling efforts, recommended that over 17 miles of stream be downgraded from HQ-Cold Water Fishery to simply Cold Water Fishery while other sections retain the HQ-Cold Water Fishery designation while upgrading the status of Hammer Creek's Walnut Run tributary to EV. This redesignation recommendation was approved by the EQB for final rulemaking at its May 18, 2011 meeting, but has not been published in the *Pennsylvania Bulletin* as of the date of this publication. Some downgrade efforts are initiated by DEP, but generally such petitions are requested by the regulated community (e.g., mining interests, sewage treatment authorities).

Some pending petitions for changes in stream designations date as far back as the year 2000. In 2008, DEP had announced efforts to address this backlog of upgrade petitions, but the energy industry's rush to tap the Marcellus Shale's natural gas reserves has strapped agency resources and once again slowed the stream redesignation process. Individuals and organizations continue to submit petitions to upgrade stream segments. The very fact that such petitions submitted continue to result in use designation upgrades suggests that additional stream miles may be eligible for HQ or EV designation, even though no individual or organized group has yet made the effort to prepare an upgrade petition. With natural gas development now threatening both water quantity and quality in many headwater streams in

⁷⁰ PA DEP. 2010. Completed Stream Redesignation Evaluations. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/Streamevaltblcomplete.pdf.

⁷¹ PA DEP. 2010. Ongoing Stream Redesignation Evaluations Report. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/StreamEvalTbl.pdf.

⁷² PA DEP. 2010. Existing Use Classification Table. Retrieved from <http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Existing%20Use/EU%20table%20list.pdf>.

Pennsylvania, the need to assess these smaller tributaries before gas drilling is allowed should be a priority as some of these streams may qualify for HQ or even EV status if the Blue Eye Run stream designation package, or bundle, is any indication.

In 2009, the Blue Eye Run bundle was the only stream redesignation package presented to the EQB by DEP for rule-making. The Blue Eye Run bundle proposed upgrading 17 waterbodies in Clinton, Sullivan, Susquehanna, Warren and Wayne Counties. These redesignations were requested by DEP itself in 2002 based on monitoring data collected for the DEP's Surface Water Quality Network for the purpose of establishing additional reference stations to assist with development of the multi-metric IBI discussed previously. Even with the request for the redesignations coming from DEP, the upgrade process took over seven years, from April 2002 to December 2009. The EQB approved the proposed rulemaking for the Blue Eye Run bundle at its April 2009 meeting and opened the decision to public comment for 45 days. In June, DEP submitted the proposed rulemaking to the Independent Regulatory Review Commission which made no comment. At its December meeting, the EQB recommended the stream bundle for final rulemaking and it was published in the *Pennsylvania Bulletin* in April 2010.⁷³

Prior to the December action by the EQB, DEP placed eight of the 17 stream segments in the Blue Eye Run bundle on the *Existing Use Classification Table* with more protective interim use designations. It is unclear why the other remaining nine streams—all located in Sullivan County—were not included on the *Existing Use Classification Table*. What is clear is that with budget cuts, staffing vacancies and the demands of gearing up to regulate to natural gas development, movement on use designation upgrades to protect Pennsylvania's cleanest streams has slowed dramatically creating a backlog that continues to build.

The EQB considered only two stream redesignation bundles in 2010: the Clarks Creek bundle and the Fishing Creek bundle. The Clarks Creek bundle included streams submitted for use designation upgrade in 2002 and 2003. The Fishing Creek bundle included streams submitted for use designation upgrade in the years ranging from 2002 to 2006. The EQB approved the proposed rulemaking for the Clarks Creek stream bundle at its February 2010 meeting, but the EQB's approval of final rulemaking took fifteen more months, until May 2011.^{74,75,76} The proposed Fishing Creek bundle rulemaking was approved by the EQB at its July meeting with approval of final rulemaking taking place in May 2011.⁷⁷

For some of the streams where upgrade petitions have been requested, stream health may have changed since the petition was accepted for study, particularly where land use changes and new discharges are now present. As upgrade petitions have languished, changes in landuse may well have degraded both the quality of the stream and its habitat. The delay associated with the redesignation process penalizes streams by allowing impacts that might not have been allowed after an upgrade to HQ or EV status.

⁷³ 39 Pa.B. 3043.

⁷⁴ 40 Pa.B. 2122.

⁷⁵ PA DEP. 2011. DEP Regulatory Update May 27, 2011. Retrieved from http://files.dep.state.pa.us/PublicParticipation/Public%20Participation%20Center/PubPartCenterPortalFiles/Environmental%20Quality%20Board/Rolling_Reg_Agenda.pdf.

⁷⁶ Although the EQB met ten times in 2010, the board's first in 2011 was not held until May 18th.

⁷⁷ PA DEP. 2011. DEP Regulatory Update May 27, 2011. Retrieved from http://files.dep.state.pa.us/PublicParticipation/Public%20Participation%20Center/PubPartCenterPortalFiles/Environmental%20Quality%20Board/Rolling_Reg_Agenda.pdf.

In a 2005 report, DEP indicated that four field staff biologists were responsible for special protection surveys but that at least two more biologists were needed to address the workload.^{78,79} DEP has pointed to staffing limitations and the need for greater partnership with local communities to move petitions forward in a timely manner. With DEP's decreased budget and extensive layoffs of staff, we do not foresee improvement in staffing to speed the stream redesignation process. Cuts in DEP's budget for 2009-2010 slashed the agency's funding by 27%,^{80,81} resulting in a smaller inflation-adjusted budget than a decade ago. DEP's budget was cut further, another nine percent, for 2010-2011.⁸²

In its review of stream redesignation requests, DRN noted that while petitions to upgrade stream designations seem to languish, petitions to lower a stream's designation (which requires a rather substantial Use Attainability Analysis (UAA))⁸³ appear to have received priority. The UAA process requires an intensive commitment of agency staff and represents an expensive process. Yet, the petition to lower the designation of a portion of the East Branch Codorus Creek (the main stem from the inlet of Lake Redman to the mouth) from Cold Water Fishery to Warm Water Fishery was submitted by the York Water Company on April 16, 2002. The DEP conducted its UAA using 1997 data and made its recommendation—to lower the designation—to the EQB on September 17, 2003. Rulemaking was completed and the lowered designation finalized by November 1, 2003, just 564 days after the initial petition.⁸⁴ With budget cuts and staff vacancies, DEP staff time spent undertaking costly UAAs rather than upgrades raises questions as to departmental priorities and commitment to the protection of Pennsylvania's cleanest streams.

Of the eight completed redesignations that DRN identified that resulted in a use downgrade, three were requested by DEP and five resulted from petitions by regulated interests: two downgrades involved utilities (power and water), two involved municipal sewage treatment discharges, and one involved mining interests.^{85,86} DRN identified three pending redesignations requesting a use downgrade, one of which was brought by DEP. The remaining pending use downgrade petitions involve mining interests.⁸⁷

⁷⁸ PA DEP. 2005. Elements of Pennsylvania's Monitoring and Assessment Program. Retrieved from http://www.epa.gov/reg3wapd/monitor/pdf/pa_strategy.pdf.

⁷⁹ This need was identified before the rush to tap the Marcellus Shale's natural gas really began in Pennsylvania.

⁸⁰ Bauers, Sandy. 24 October, 2009. Pa. Budget Cuts Hamper Environmental Protection, Philadelphia Inquirer. Retrieved from <http://www.philly.com/philly/news/homepage/65889407.html?cmpid=15585797>.

⁸¹ Worden, Amy. 17 November, 2009. More Layoffs for Pa. State Workers, Philadelphia Inquirer Harrisburg. Retrieved from http://www.philly.com/inquirer/local/20091117_More_layoffs_for_Pa_state_workers.html.

⁸² Mocarsky, Steve, July 1, 2010. Group Criticizes DEP Budget Cut. Times Leader. Retrieved from http://www.timesleader.com/news/Group_criticizes_DEP_budget_cut_06-30-2010.html?searchterm=budget.

⁸³ Freedman, Paul L., et al. 2008. Factors for Success in Developing Use Attainability Analysis. Water Practice™, Vol. 2, No. 1. Retrieved from <http://www.limno.com/pdfs/S10-Freedman-Stewartetal.pdf>.

⁸⁴ PA DEP. 2002. East Branch Codorus Creek Online Report. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/Browns%20Run/East_Branch_Codorus_Creek.pdf.

⁸⁵ PA DEP. 2010. Completed Stream Redesignation Evaluations. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/StreamEvalTblcomplete.pdf.

⁸⁶ PA DEP. 2010. Ongoing Stream Redesignation Evaluations Report. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/StreamEvalTbl.pdf.

⁸⁷ PA DEP. 2010. Ongoing Stream Redesignation Evaluations Report. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/StreamEvalTbl.pdf.

Review: Permitting Notices

DRN reviewed application and permit notices in the *Pennsylvania Bulletin* online,⁸⁸ the Commonwealth's official gazette for information and rulemaking, to track applications for new, additional, or increased discharges to HQ or EV waters. Under the Clean Streams Law and the federal Clean Water Act, applications received by DEP for new, additional, or increased point source discharges to HQ or EV surface waters of Pennsylvania are among the discharges that must be advertised in the *Pennsylvania Bulletin*. The period of DRN's review extended from January 2008 through December 2009.

DRN focused on three types of applications for new, additional, or increased point source discharges to HQ or EV surface waters of Pennsylvania:

A. *Applications for New or Expanded Facility Permits, Renewal of Major Permits and EPA Nonwaived Permit Applications.*

Anyone discharging wastewater— whether it is from a small flow from an on-lot sewage system or millions of gallons per day from a municipal treatment plant or an industrial source—to the waters of the Commonwealth is required under the Clean Water Act and Pennsylvania's Clean Streams Law to have an NPDES permit. These permits establish discharge limits for pollutants contained in the discharges as well as monitoring and reporting requirements. Proposals to discharge to waters designated HQ or EV are supposed to be under greater scrutiny to prevent degradation. Discharges that existed before an HQ or EV designation are grandfathered and are not required to comply with the more stringent antidegradation regulations, unless they want to increase their discharges.

DRN tracked the status of applications for New or Expanded Facility Permits, Renewal of Major Permits and EPA Nonwaived Permit Applications received across all regional DEP offices during the review period.

B. *NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities.*

Any construction activity with a discharge to waters of the Commonwealth requires an NPDES stormwater discharge permit. Agricultural activities and some road maintenance are exempted from this requirement which otherwise applies to any earth disturbance activity involving an acre or more.⁸⁹ Discharges to HQ or EV streams require application an Individual Permit to discharges of stormwater associated with construction activity rather than the more streamlined General Permit application process.

DEP has delegation agreements with most of Pennsylvania's 66 conservation districts to administer permitting for NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities.⁹⁰ DRN broke out data for permits by both DEP region and by county for additional insight into the pace of permitting.

⁸⁸ Available at <http://www.pabulletin.com>. Material on this Web site has been drawn directly from the official *Pennsylvania Bulletin*.

⁸⁹ §102.5. Permit requirements.

⁹⁰ The PA DEP enters into agreements with county conservation districts delegating varying levels of authority for NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities. Level I delegation includes processing these permits. Level II delegation adds issuing of permits. Level III delegation includes processing, issuing and conducting enforcement actions in certain circumstances.

Due to the number of applications of NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities, DRN only examined the status of those applications that fell within the boundaries of the Delaware River watershed.

C. *Coal and Noncoal Mining Activity Applications that included an NPDES permit.*

During the period of this review, any mining activity that included a stream discharge required an Individual NPDES permit in addition to a mining permit. In 2010, after the period covered by this review, DEP issued GP-104, *General NPDES Permit for Stormwater Discharges Associated with Mining Activities*, for discharges composed entirely of stormwater. However an Individual NPDES permit is still required whenever discharges associated with mining activities will discharge to HQ or EV waters. NPDES permits are generally issued in conjunction with the mining permit but are conditional upon approval of the mining permit.⁹¹

DRN looked at the status of all applications of Coal and Noncoal Mining Activity Applications that included an NPDES permit across all regional DEP offices which were applied for or acted upon during the review period.

For all three types of permits reviewed, applications received up to the review end date were included in the permit tracking. It should be noted that applications not permitted during the review period do not necessarily reflect returned or withdrawn applications or denied permits. For example, an application by West Vincent Township in Chester County for an NPDES Individual Permit for Discharges of Stormwater Associated with Construction Activities associated with the Route 100 and Nantmeal Road Realignment was initially published in the April 15, 2006, *Pennsylvania Bulletin*. This application, which would impact an EV stream (Birch Run) was not withdrawn or returned, but was ultimately permitted with the approval notice appearing in the December 12, 2009 issue, an interval of 1,337 days, well beyond the time frame of DRN's two year (731-day) review. Given the length of time that can be required for permitting decision making, the body of work to ascertain whether applications not permitted during the review period would ultimately be withdrawn or returned was not included in the scope of this review. Also note that DRN did not track the number of returned or withdrawn applications during the review period, again because of the period of time that may be involved in the permitting process.

Permitting Notice Review Disclaimers

DRN did not review:

- Renewal of minor permits for any discharges to HQ or EV surface waters,
- Renewal of NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities,
- Renewal of Coal and Noncoal Mining Activity Applications that included an NPDES permit, or
- NPDES permitting associated with concentrated animal feeding operations (CAFOs).

⁹¹ PA DEP. 2011. General NPDES Permit for Stormwater Discharges Associated with Mining Activities. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-82242/5600-PM-MR0388%20Cover%20removed.pdf>.

Permitting Notice Review Results

A) *New or Expanded Facility Permits, Renewal of Major Permits and EPA Nonwaived Permit Applications*

Thirty-six (36) applications for New or Expanded Facility Permits, Renewal of Major Permits and EPA Nonwaived Permit Applications proposed to impact HQ or EV waters were received during the review period. Of these, 32 were approved during the review period for an approval rate of nearly 90%. Only two of the 36 applications received during the review period proposed to impact EV waters. Those applications had not been permitted as of January 1, 2010.

For all of the types of permit applications DRN tracked, a 30-day comment period begins upon publication of a notice in the Pennsylvania Bulletin. Anyone wishing to comment on a specific application must do so within 30 days of the date of the issue of the Pennsylvania Bulletin in which the notice appears.

DRN found the interval between the date of the application notice and the date of the permit approval notice for all New or Expanded Facility Permits, Renewal of Major Permits and EPA Nonwaived Permit Applications averaged 64 days. The DEP regional office with the shortest average processing interval was the Northcentral office at 56 days. The longest average processing interval at just 70 days was seen in the Southwest office. Both the shortest and longest processing intervals, 42 and 105 days respectively, were found in the Northwest office which also received 16 total applications or nearly half of all such applications submitted to DEP.

The majority (24) of the New or Expanded Facility Permits, Renewal of Major Permits and EPA Nonwaived Permit Applications proposing to impact HQ or EV waters that were received by DEP during the review period were for Small Flows Treatment Facilities, or SFTFs. These are domestic wastewater treatment facilities with flows not greater than 2,000 gallons per day. Eight (8) applications for SFTFs were received in 2008; sixteen (16) were received in 2009. SFTFs are generally applied for upon the failure of an on-lot treatment system (More information on SFTFs can be found in Appendix C).

B) *NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities*

During the review period, 330 applications for new NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities proposed to impact HQ or EV waters in the Delaware River watershed appeared in the *Pennsylvania Bulletin*. Of these, 204 were approved during the review period for an approval rate of 62%. DRN found the interval between the date of the application notice and the date of the permit approval notice for all NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities averaged 169 days. Less than 25% of applications received during the review period proposed to impact EV waters.

The volume of permit applications for discharges of stormwater associated with construction activities raises concerns for water quality on a broad scale. Real-world research has revealed that detention basins have little attenuating effect on the stormwater flow regime.⁹² In fact, Emerson found that the network of detention basins in the Valley Creek watershed actually increased watershed-wide peak flow

⁹² Emerson, Clay H. 2003. Evaluation of the Additive Effects of Stormwater Detention Basins at the Watershed Scale, A Thesis Submitted to the Faculty of Drexel University. Retrieved from http://userpages.umbc.edu/~welytc/Emerson_thesis.pdf.

rates. Emerson determined that a volume-based approach to stormwater management was the only effective method for reducing peak flows.

Pennsylvania's current stormwater management policy calls for avoiding, minimizing, and then mitigating the effects of stormwater runoff through best management practices (BMPs) that focus on infiltration, water quality treatment, and volume and rate discharge controls.⁹³ The *Pennsylvania Stormwater Best Management Practices Manual*⁹⁴ provides guidance for the selection of BMPs for managing stormwater, but the manual is not a regulation; Pennsylvania's Stormwater Management Program is a planning program without permitting authority. Responsibility for implementing this program may lie with DEP, but the regulatory responsibility lies at the municipal level and is the municipal stormwater ordinance.

In 2009, DEP pulled from conservation districts the responsibility to regulate either earth disturbance activities or waterway encroachments related to the exploration for, or extraction of, oil and gas whether these activities be associated with more shallow drilling or with deeper drilling in the Marcellus Shale. This action increased the regulatory and enforcement burden on DEP even as budget cuts forced reduction to its lowest staffing numbers in a decade.^{95,96} With numbers for both applications for drilling in the Marcellus Shale and wells being drilled skyrocketing,⁹⁷ DEP began increasing staff in its oil and gas drilling section, however no staffing increase is occurring in other sections such as water management where staff are also responding to demands arising from the Marcellus boom.⁹⁸ DEP staff have expressed concern about the 45-day timeframe allowed the agency to approve or deny an oil and gas permit application.⁹⁹ After 45 days, if DEP has not acted on the application, the Oil and Gas Permit is automatically approved. Depositions of DEP staff taken by attorneys representing DRN for a lawsuit that challenges DEP's permitting of a natural gas well revealed that, while some staff took as much as 30-minutes to review an application, other staff completed their review in as little as two-minutes.^{100,101}

⁹³ PA DEP. 2006. Pennsylvania Stormwater Best Management Practices Manual. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-68851/363-0300-002.pdf>.

⁹⁴ Available at <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-68851/363-0300-002.pdf>.

⁹⁵ Bauers, Sandy. 24 October, 2009. Pa. Budget Cuts Hamper Environmental Protection, Philadelphia Inquirer. Retrieved from <http://www.philly.com/philly/news/homepage/65889407.html?cmpid=15585797>.

⁹⁶ Worden, Amy. 17 November, 2009. More Layoffs for Pa. State Workers, Philadelphia Inquirer Harrisburg. Retrieved from http://www.philly.com/inquirer/local/20091117_More_layoffs_for_Pa_state_workers.html.

⁹⁷ DEP figures show that in 2007, only 27 wells were drilled in the Marcellus Shale. In 2008, the number grew to 195 and, in 2009, it increased to 786. The number of wells in drilled in the Marcellus Shale in 2010 rose to 1,454. DEP issued 3,314 Marcellus Shale permits in 2010, which represents over half the total number of permits for oil and gas wells issued in Pennsylvania that year.

⁹⁸ Shankman, Sabrina. 9 February 2010. New Gas Drilling Rules, More Staff for Pennsylvania's Environmental Agency. Pro Publica. Retrieved from <http://www.propublica.org/article/new-gas-drilling-rules-more-staff-for-pennsylvanias-environmental-agency>.

⁹⁹ Roberts, Scott. 28 September 2010. Testimony before Philadelphia Council Hearing, Joint Committees on Transportation and Public Utilities and Environment. Retrieved from <http://legislation.phila.gov/transcripts/Public%20Hearings/environment/2010/en092810.pdf>.

¹⁰⁰ Phillips, Susan. 14 April 2011. DEP regulators rush through gas-drilling permit reviews. Newsworks. Retrieved from <http://www.newsworks.org/index.php/local/item/17303-13spdep>.

¹⁰¹ The *Permit Application for Drilling or Altering a Well* form is only two pages in length and consists of a primarily of a series of boxes to check. The form can be viewed here: <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-79067/02%205500-PM-OG0001%20Form.pdf>.

Permitting for gas drilling in the Marcellus Shale underlying the Delaware River watershed is now limited due to a partial moratorium in place.¹⁰² However, some exploratory wells were allowed to be drilled so, in November 2010, DRN undertook a review of permitting for earth disturbance activities associated with these exploratory wells.¹⁰³ It is believed that the thickest beds of shale will produce the most natural gas, and the thickest beds of Marcellus Shale are found in northeastern Pennsylvania, under the headwaters of the Delaware River suggesting pressures to drill here will be great should the moratorium be lifted.

DRN found that DEP does not require an individual permit for oil and gas drilling associated earth disturbances of less than five acres. For facilities with less than five acres of disturbance, a streamlined general permit is used and an Erosion and Sediment Control Plan is required but need not be submitted to the agency for review. It appears that in many instances (and perhaps with encouragement from DEP¹⁰⁴), the drilling operators are attempting to keep areas of earth disturbance just under the five acre requirement in order to avoid having to obtain an individual permit called an *Erosion and Sediment Control General Permit* (ESCGP-1) from the agency.

A closer look at the process DEP has put in place for erosion and sediment control and stormwater management associated with oil and gas exploration and extraction reveals problems and inadequacies. DEP has also created an expedited process for submission of an ESCGP-1 Notice of Intent (NOI). A standard ESCGP-1 must be submitted at least 60 days before earth disturbance is begun. The expedited ESCGP-1 NOI can be submitted as late as 14 days before the proposed earth disturbance. DRN reviewed four exploratory wells that needed ECSGP-1 permits and would impact HQ streams in the Delaware River watershed; all four utilized the expedited process.¹⁰⁵

DRN reviewed two permit applications (Teeples Well 1-1 and Woodland Management Partners) for exploratory wells, both in HQ watersheds, and both reported as being under five acres in area. As such these operations fell under the streamlined general permit application process and were not required to submit an Erosion and Sediment Control Plan. DRN found significant inaccuracies including major discrepancies in acreage estimates (the trigger for the ECSGP-1 permit), that were not corrected before permit approval.

Pennsylvania's own antidegradation policies and procedures should require an individual permit in HQ and EV watersheds. However, for oil and gas facilities affecting less than five acres, only a general permit is necessary regardless of HQ or EV status.¹⁰⁶ This is a clear contradiction of Pennsylvania's

¹⁰² The Delaware River watershed is one of the few areas in this country where gas drilling has been delayed while stronger regulations are being considered by the Delaware River Basin Commission (DRBC). DRBC's role is to protect the Delaware River as a drinking water supply as well as the River's exceptional water quality and natural assets. DRBC has classified the entire non-tidal River under its Special Protection Waters Program. Because DRBC determined that shale gas development has the potential to substantially impact the water resources of the basin, the agency used its regulatory power to institute a moratorium on shale gas production wells until natural gas-specific regulations can be put in place.

¹⁰³ Exploratory wells were exempted from the DRBC moratorium by a loophole.

¹⁰⁴ 36 Pa.B. 7071.

¹⁰⁵ Exploratory wells were exempted from the DRBC moratorium by a loophole.

¹⁰⁶ DRN and Damascus Citizens for Sustainability filed an appeal before the Pennsylvania Environmental Hearing Board in 2010 challenging DEP's approval of six exploratory wells permitted in the Delaware River watershed (Woodland Management Partners Well (Permit 37-127-20017) asserting that errors in approval of this application include not considering the application under its antidegradation program and by automatically equated compliance with regulatory

antidegradation policies and procedures which require that the water quality of EV waters be maintained and only allow degradation of HQ waters for important economic or social justification. The general permit process does not require important information be submitted as part of the application that would normally be included in either a general or an individual or NPDES permit: project description, project acreage and disturbed area, identification of geologic formations or soil conditions that may cause pollution and description of BMPs to minimize impacts, consideration of a site's natural resources in location and design of the project, and site contact information.

DRN found that DEP regulates earth disturbance associated with oil and gas exploration and extraction differently. For example, gravel roads, an earth disturbance, were actually listed as a BMP for erosion and sediment control under the ESCGP-1. The Woodland Management Partners Well had no erosion and sediment control measures for an 850 linear foot access road. By contrast, DEP requires that gravel roads supporting geothermal wells have erosion and sediment controls like silt fences and compost socks to prevent pollution.

Through the ESCGP-1, DEP also provides a number of avenues for the industry to avoid providing post construction runoff calculations.¹⁰⁷ Under ESCGP-1, when no impervious surfaces are used supporting calculations are not required, but “[c]rushed rock or gravel roads are not considered impervious.” However, before crushed rock or gravel are applied, the road base material will require compacting and any rainfall penetrating the crushed rock or gravel will run off when it hits the base layer.

DRN's review of the Davidson 1V Well Pad Site found discrepancies and likely incorrect post construction calculations provided by the gas operator who states that the site will have reduced volume of stormwater runoff after development because the vegetation will consist of “brush” rather than “wooded areas.” The plant list shows most of the planting mix is grasses which will have a higher runoff coefficient than woodland.

DRN's limited review suggests that stormwater management regulations and policies for oil and gas exploration and extraction facilities operating in Pennsylvania are less comprehensive, significantly less strict, and are subject to far less regulatory review than virtually any other construction or industrial activity in the state. The current regulatory process for review, approval, and operation of oil and gas exploration and extraction facilities fails to ensure design and implementation of both erosion control and stormwater management measures that are sufficient to protect water quality.

C) Coal and Noncoal Mining Activity Applications

Twenty-eight (28) applications for discharges in support of new, revised or amended coal and noncoal mining activities that were proposed to impact HQ or EV waters in Pennsylvania were active during the review period. Of these, 16 were approved during the review period for an approval rate of 57%. DRN found the interval between the date of the application notice and the date of the permit notice for new, amended or expanded Coal and Noncoal Mining Activity Applications to be the longest of all the types

requirements with a factual determination that a permitted practice will not have an adverse impact on Hollister Creek's HQ use.

¹⁰⁷ PA DEP. 2011. Instructions for a Notice Of Intent (NOI) for Coverage Under the Erosion and Sediment Control General Permit (ESCGP-1) for Earth Disturbance Associated With Oil and Gas Exploration, Production, Processing or Treatment Operations or Transmission Facilities. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-83401/Modified%205500-PM-OG0005%20NOI%20Instructions%202.pdf>.

of applications reviewed. Approved applications averaged 377 days. Coal and Noncoal Mining Activity Applications are processed in one of six district mining offices. The Cambria and Greensburg District Mining Offices were processing the most applications, nine and eight respectively, which together represented more than half the total number of applications seeing activity during the review period. Applications related to coal mining constituted roughly 65% of all active mining applications to DEP during the review period. Only one mining application received during the review period proposed to impact an EV waters and this was an application for a renewal of an existing discharge with a boundary correction increasing the total permitted acreage.

Review: SEJ Rulings

DRN also undertook research to better understand SEJ, how the SEJ process has evolved in Pennsylvania, and how well the process today adheres to the Pennsylvania's *Water Quality Antidegradation Implementation Guidance*. DRN staff began their review of SEJ by talking to the staff of DEP's Division of Water Quality Assessment and Standards for background information. DRN staff also reviewed notices of SEJ in the *Pennsylvania Bulletin* and reviewed the centralized file that DEP is supposed to maintain. DRN also examined a limited number of permit files for insight into the implementation of the SEJ process in Pennsylvania. DRN staff reviewed a variety of permit files for new, additional or increased discharges to HQ waters. These file reviews were undertaken through public file review procedures via contacts with DEP Records Management units.

DRN learned through communications with DEP staff that very few SEJ reviews are undertaken for proposed sewage treatment or industrial discharges and no SEJ reviews are undertaken for stormwater (PA DEP staff, Personal Communication, August 2007). Under Pennsylvania's *Water Quality Antidegradation Implementation Guidance*, DEP's Bureau of District Mining and Bureau of Oil and Gas Management conduct their own SEJ reviews with input from Division of Water Quality Assessment and Standards staff, further limiting the SEJ reviews that DRN anticipated would be contained in DEP's centralized file.

A) Notices of SEJ in the *Pennsylvania Bulletin*

DRN reviewed the *Pennsylvania Bulletin* for notations of SEJ in permit applications. Back issues of the *Pennsylvania Bulletin* are available online dating to 1996. With 1999¹⁰⁸ as the date of the adoption of Pennsylvania's written antidegradation policy and 2003¹⁰⁹ as the date of the adoption for Pennsylvania's written implementation methods, *Water Quality Antidegradation Implementation Guidance*, DRN felt the some background information about the implementation of SEJ would likely be found in back issues of the *Pennsylvania Bulletin*. Although applications referencing the submission of a "social and economic justification" appear in the *Pennsylvania Bulletin* before the 2003 approval of the implementation methods, DRN review was limited to those SEJs that appeared after the effective date of the guidance, November 29, 2003.

The first reference to SEJ found in the *Pennsylvania Bulletin* appears in May 2004¹¹⁰ when DEP's Northcentral Regional office disapproved a sewage facilities planning module for failure to protect

¹⁰⁸ 29 Pa.B. 3720.

¹⁰⁹ PA DEP. 2003. *Water Quality Antidegradation Implementation Guidance*. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-47704/391-0300-002.pdf>.

¹¹⁰ 34 Pa.B. 2336.

wetlands, failure to show effluent would meet discharge limits, and failure to fully evaluate non-discharge alternatives. Later, in August 2004,¹¹¹ a second disapproval under SEJ was found when DEP's Southeast Regional office disapproved a sewage facilities planning module for a stream in the Delaware River watershed because no social and only minimal economic benefit was anticipated and DEP could not determine from the materials submitted whether the existing on-lot sewage disposal system was creating a public health or pollution hazard. The disapproval also lists several inadequacies in the application including the failure of the public notice to list the antidegradation classification of Ridge Valley Creek, the receiving stream.¹¹² *Pennsylvania Bulletin* records online indicate that before 2004, three applications for discharges from on-lot treatment systems to Ridge Valley Creek or its tributaries were received and permitted. After this disapproval, only one such application was received and permitted. Before 2004, one application for discharge of stormwater associated with construction activities, which wrongly listed the designation as Cold Water Fishery, was received and permitted. After this disapproval, four such applications were received and permitted.

DRN's review of the *Pennsylvania Bulletin* identified six additional permits involving SEJs between 2005 and March 2011. These consisted of three sewage facilities planning modules (for two on-lot systems and one economic financing authority), one construction site stormwater discharge (for the Pennsylvania Department of Transportation), one industrial discharge (PFBC), and one sewage discharge (for a municipal treatment authority). All applications were approved.

B) DEP's Centralized File

DEP's Division of Water Quality Assessment and Standards is charged with maintaining a centralized file of all SEJs for historical purposes, to provide statewide consistency, and to ensure compliance with antidegradation policy.¹¹³ DRN viewed DEP's centralized SEJ file in Harrisburg. Although DRN viewed the complete SEJ file, detailed here are only those SEJs processed under current antidegradation guidance.

DRN found the number of SEJ reviews contained in the centralized file in Harrisburg was greater than the number of applications appearing in the *Pennsylvania Bulletin* that referenced a SEJ review. DRN re-checked these listings to review permit applications in the *Pennsylvania Bulletin* and confirmed that notice of a SEJ review was not always included in the public notices for these applications.

A 2003 SEJ review, before the effective date of the guidance, for a proposed resort hotel and water park appears to be the first attempt to utilize a full SEJ review team to evaluate a permit application (PA DEP staff, Personal Communication, 14 July 2003). Although file correspondence suggests that this first attempt in 2003, in retrospect, was considered beneficial, the antidegradation program appears to have struggled with full SEJ review participation from the very beginning with only three DEP regions providing input to the review. Although input from different disciplines was considered helpful, mandated timetables for permitting were a concern and one that affected full participation. DEP staff also struggled to determine the criteria that should be considered for reviewing SEJs (PA DEP staff, Personal Communication, 14 July 2003).

¹¹¹ 34 Pa.B. 4737.

¹¹² Ridge Valley Creek, a tributary of the Unami Creek, is not listed by name in Chapter 93, where Pennsylvania's water quality standards and designated water uses are found (§93.9f. Drainage List F).

¹¹³ PA DEP. 2003. Water Quality Antidegradation Implementation Guidance. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-47704/391-0300-002.pdf>.

In 2004, a statewide SEJ review team was organized¹¹⁴ and the SEJ process was laid out for those assigned to the review team as well as the Regional Water Quality Managers in the six DEP regional offices (PA DEP staff, Personal Communication, 22 January 2004). Members of the review team appeared to participate reluctantly, to be unsure of the value of their participation, and the appropriateness of their roles (PA DEP staff, Personal Communication, 13 April 2004; PA DEP staff, Personal Communication, 24 February 2005). By 2007, the SEJ review team as described by the *Water Quality Antidegradation Implementation Guidance* no longer appeared to exist. SEJ reviews are now conducted by one or two DEP Water Quality Standards Division staff in conjunction with permitting staff in the regional offices (PA DEP staff, Personal Communication, 26 March 2007). Conversations with DEP staff also confirm the switch from a statewide review team to a smaller number of reviewers. Work load, travel constraints, and limited staff time resulted in SEJ reviews conducted by smaller groups with representatives from only the region in which the permit was processed and the Division of Water Quality Assessment and Standards (PA DEP staff, Personal Communication, 9 September 2010).

Although failure to utilize a SEJ review team, as required under DEP's own guidance, may seem to be a way to simply maximize staff efficiency, this procedure has implications for the implementation of Pennsylvania's antidegradation policies. The small number of DEP staff, as low as two (PA DEP staff, Personal Communication, 9 September 2010) that may take part in a SEJ review means that the recommendations of the individuals involved factor significantly in the ultimate decision made regarding the discharge to be permitted. Furthermore, the small number of staff involved in SEJ reviews limits awareness and understanding of the process within the agency even as it raises concerns for consistency over time for when the agency experiences transition in the staff positions involved in SEJ review. These issues highlight the importance of maintaining a centralized SEJ file. This centralized file should be accessible online to staff in regional offices and should provide examples of review procedures, offer a roadmap for DEP staff to follow, and ensure consistency in the application of SEJ both over time and across DEP offices.

Agency emails show that the staff of the DEP's Water Quality Standards Division, who are charged with ensuring statewide consistency for SEJ reviews, struggled to get regional water quality programs to accept the SEJ process:

- A regional water quality manager intended to permit discharges from on-lot sewage systems without SEJ review and was cautioned to ensure that nondischarge alternatives analyses are conducted (PA DEP staff, Personal Communication, 17 September 2004).
- Despite the SEJ review team's recommendation of denial, a regional water quality manager moved to approve an incomplete SEJ that did not look at nondischarge alternatives (PA DEP staff, Personal Communication, 15 March 2005). This resulted in the review team updating its SEJ review checklist and approving the SEJ (PA DEP staff, Personal Communication, 15 March 2005 and 23 March 2005).

Other state agencies appeared no more willing to accept the SEJ process as evidenced by the construction site stormwater discharge for the Pennsylvania Department of Transportation which needed

¹¹⁴ Pennsylvania's *Water Quality Antidegradation Implementation Guidance* states that the statewide SEJ review team is to be comprised of representatives from each of DEP's six regional offices as well the Division of Water Quality Assessment and Standards in the central office. The following program areas are to be represented: Surface water quality monitoring (biological, physical, chemical); Groundwater protection (quality and quantity); Wastewater treatment plant operation (process technology/reliability); Wastewater management (planning and permitting); Surface water management (nonpoint source controls, hydraulics, channel morphology); and Antidegradation Program Policy and Procedures.

to be approved after a degrading discharge to HQ waters was already occurring (PA DEP staff, Personal Communication, 5 October 2004).

D) Use of SEJ in New or Expanded Facility Permits, Renewal of Major Permits and EPA Nonwaived Permit Files

Over the course of its review of the *Pennsylvania Bulletin*, DRN identified one SEJ review associated with an increased discharge to an HQ water from an existing sewage treatment plant.¹¹⁵ No statewide team reviewed this SEJ. The DEP staff involved in the SEJ review did not include representatives from each of DEP's regional offices. Only one regional office and the central office were represented.

Under Pennsylvania's *Water Quality Antidegradation Implementation Guidance*, the statewide SEJ review team is to be comprised of representatives from each of DEP's six regional offices as well the Division of Water Quality Assessment and Standards in the central office. However DEP staff included in this SEJ review represented only Surface Water Quality Monitoring (biological), Wastewater Management (planning and permitting), and Antidegradation Program Policy and Procedures. The Chief Counsel's office was also represented.¹¹⁶

E) Use of SEJ in NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities

As previously noted, DRN learned that no SEJ reviews are undertaken for stormwater (PA DEP staff, Personal Communication, 14 March 2005). DEP considers that SEJ is structured for use with continuous discharges where pollutant loads can be calculated and treated. DRN learned that DEP considers that, by first conducting the nondischarge alternatives analysis for proposed stormwater discharges and then working with applicants to utilize antidegradation best available combination of technologies (ABACT), SEJ is not required as all the permits are considered to be non-degrading discharges (PA DEP staff, Personal Communication, 13 October 2009). No monitoring of the discharge is required (PA DEP staff, Personal Communication, 14 March 2005).

Pennsylvania's *Water Quality Antidegradation Implementation Guidance* lays out a two-part evaluation procedure for DEP staff to employ to determine whether a proposed discharge can be considered to be non-degrading. This evaluation procedure relies on modeling of the pollutant of concern and subjective factors including the nature of the pollutants, treatment reliability, discharge duration, as well as physical and/or location concerns. However, recent court cases challenging DEP's permitting of stormwater in HQ and EV watersheds provide a different perspective on the real-world results¹¹⁷ of DEP's nondischarge alternatives analysis and supposed non-degrading discharges.

¹¹⁵ 38 Pa.B. 5320.

¹¹⁶ Milford-Trumbauersville Area Sewer Authority Wastewater Treatment Plant, NPDES Permit No. PA0042021 DEP file correspondence.

¹¹⁷ A 2010 report detailed how DRN engaged stormwater experts to review a number of projects approved in Hamilton Township, Mercer County, New Jersey. Twelve projects were reviewed for completeness, accuracy and whether the stormwater system honored the intent of New Jersey's Stormwater Management Rules. Each project was then scored using a standard 100-point scale grading system measuring compliance with the New Jersey's Stormwater Management Rules. Grades ranged from 25% to 79%, with an average compliance grade of 42%. With regard to the use of nonstructural stormwater management strategies — a primary goal of the New Jersey program — the average compliance grade was a dismal 13%. The report, *New Jersey Stormwater Management Implementation : A Case Study of Hamilton Township, Mercer County*, is available at http://www.delawareriverkeeper.org/resources/Reports/Hamilton_Twp_NJ_SWM_Implementation_Report.pdf.

In *Blue Mountain Preservation Association v. DEP and Alpine Resorts*, testimony by DEP staff suggest that, in practice, the permitting of stormwater discharges to HQ and EV waters might rely not on a thorough analysis of multiple nondischarge alternatives, but on an analysis of as few as one nondischarge alternative. ABACT may amount to implementation of BMPs and the use of accepted engineering practices when implementing them without any demonstration that the BMPs employed actually result in protection of the receiving stream.¹¹⁸

Blue Mountain Preservation Association v. DEP and Alpine Resorts illustrates inconsistency between Pennsylvania's antidegradation policy and DEPs' implementation of that policy in the permitting of new stormwater discharges to HQ and EV waters. A stormwater discharge permit was granted to Alpine Resorts for an HQ water without a nondischarge alternatives analysis being conducted or a SEJ review. In this case, DEP argued that compliance with special protection BMPs requirements of Chapter 102 in effect fulfilled any requirements for antidegradation analysis. However, the Environmental Hearing Board (EHB)¹¹⁹ disagreed and overturned the permit granted to Alpine. The EHB found that both sets of regulations need to be applied, that Chapter 102 did not obviate or replace the need for application of antidegradation analysis (see Appendix D for a listing of structural and non-structural BMPs as well as guidance provided for special protection BMPs).

Crum Creek Neighbors v. Commonwealth, DEP and Pulte Homes was brought after DEP issued a permit to Pulte Homes for *NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities*.¹²⁰ The permitted discharge was to a portion of Holland Run designated warm water fishery, but experts for Crum Creek Neighbors determined that discharge would enter a segment of Holland Run designated EV, in fact Delaware County's only EV designated stream. The EHB agreed with the Crum Creek Neighbors' expert and found that selection of nondischarge alternatives BMPs identified in technical guidance documents does not ensure that no discharge will occur.¹²¹

An EV designation does not mean that a proposed stream discharge will be denied. As long as the proposed discharge is considered to be non-degrading, DEP will permit a discharge for either an HQ or EV water.¹²² However, in *Crum Creek Neighbors v. Commonwealth, DEP and Pulte Homes*, DEP was accepting infiltration of the 2 year/24 hour volume control standard as a nondischarge alternative even though agency staff acknowledged that large storms would result in discharges to the EV section on Holland Run. The EHB faulted DEP's analysis and remanded the permit to DEP for "a proper analysis based on the proven fact that the recharge basins will discharge directly to the EV portion of the stream."¹²³

¹¹⁸ *Blue Mountain Preservation Association v. DEP and Alpine Resorts*, EHB 2005-077-K. 2006. Retrieved from <http://blogs.law.widener.edu/envirolawcenter/files/2009/09/BMPA-EHB-9-7-06-Opinion.pdf>.

¹¹⁹ The Environmental Hearing Board, <http://ehb.courtapps.com/public/index.php>, is a trial court established by statute to hear appeals of actions of the Pennsylvania Department of Environmental Protection. The EHB had jurisdiction statewide in Pennsylvania.

¹²⁰ 38 Pa.B 424.

¹²¹ *Crum Creek Neighbors v. Commonwealth, DEP and Pulte Homes*, EHB Docket No. 2007-287-L. 2009. Retrieved from <http://ehb.courtapps.com/efile/documentViewer.php?documentID=4561>.

¹²² If the discharge in question had been to an HQ stream, DEP could have permitted a degrading discharge after a SEJ review if it found the potential impacts of the proposed degrading discharge were offset by the benefits anticipated from the proposed discharge.

¹²³ *Crum Creek Neighbors v. Commonwealth, DEP and Pulte Homes*, EHB Docket No. 2007-287-L. 2009. Retrieved from <http://ehb.courtapps.com/efile/documentViewer.php?documentID=4561>.

Also, in response to Crum Creek Neighbors assertion that the Pulte Homes development would affect baseflow of the EV segment of Holland Run, the EHB reiterated the principle that found that stream degradation results not only from discharges to a stream, but also from changing a stream's course, movement, circulation or flow including baseflow.¹²⁴

C) Use of SEJ in Coal and Noncoal Mining Activity Application

DRN reviewed an application for a discharge to an HQ-Cold Water Fishery receiving stream (with proposed impacts to EV wetlands) associated with a proposed noncoal mining operation. Correspondence in the file reviewed for this application details recognition of the need to follow Pennsylvania's *Water Quality Antidegradation Implementation Guidance* for a pre-application meeting, Special Protection standards, and SEJ review including securing additional input from other DEP offices as well as the PFBC and the Pennsylvania Game Commission.

Historically, DEP's District Mining has required applications for discharges to HQ or EV waters associated with proposed mining operations to complete a Module 24: Special Protection Waters.¹²⁵ This three-page module asked applicants to provide information that can be used by District Mining staff to undertake the evaluation required for the SEJ review. For the application DRN reviewed, Dingman's Ferry Stone, Inc. (Application No. 52090301 and NPDES Permit No. PA0224791), Module 24 was completed. DRN found the answers provided for Module 24 too brief, with no evidence that a nondischarge analysis had been prepared, and that assertions as to social and economic benefits were made without any supporting documentation or references being provided. Documentation supporting any request for SEJ is required: "The burden of proof is on the project/activity sponsor to document and demonstrate that the benefits of the proposal outweigh the environmental impacts of lower water quality."¹²⁶ District Mining has not rejected this application and as of the date of this publication the permit request is still pending.

Module 24: Special Protection Waters was recently replaced with a new form, *Social or Economic Justification (SEJ) and Water Use Demonstration (for projects in high quality [HQ] waters only)*¹²⁷. The new form is 5 pages long (compared with the 3 page Module 24) and requests more information about the potential impacts of the proposed discharge on the receiving stream, characteristics of the receiving stream, impacts on recreation, tourism and the quality of life of adjacent property owners, and now includes an affidavit.

The introduction of *Social or Economic Justification (SEJ) and Water Use Demonstration* follows District Mining's November 2009 introduction of a new form, *Anti-Degradation Supplement for Mining Permits*,¹²⁸ into its permitting procedures. *Anti-Degradation Supplement for Mining Permits* provides applicants with a checklist and structure for performing the nondischarge alternatives analysis. If no environmentally sound and cost-effective non-discharge alternative exists, the *Anti-Degradation*

¹²⁴ Crum Creek Neighbors v. Commonwealth, DEP and Pulte Homes, EHB Docket No. 2007-287-L. 2009. Retrieved from <http://ehb.courtapps.com/efile/documentViewer.php?documentID=4561>.

¹²⁵ PA DEP. 2004. Module 24: Special Protection Waters. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-56470/Module%2024.pdf>.

¹²⁶ PA DEP. 2003. Water Quality Antidegradation Implementation Guidance. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-47704/391-0300-002.pdf>.

¹²⁷ Available at <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-81273/5600-PM-MR0028.pdf>.

¹²⁸ *Anti-Degradation Supplement for Mining Permits*. 2009. <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-77549/5600-PM-MR0007.pdf>.

Supplement for Mining Permits provides applicants with a structure to use ABACT to achieve a non-degrading discharge. Applicants are now only required to complete the *Social or Economic Justification (SEJ) and Water Use Demonstration* form when a non-degrading discharge to HQ waters cannot be achieved.¹²⁹ Previously, all mining permit applicants proposing discharges to HQ or EV waters were required to complete Module 24.

Although the *Anti-Degradation Supplement for Mining Permits* was finalized in November 2009, language noted in mining permit applications by DRN staff during its two year review suggested that this form was already in use, or was at least being piloted, in some district mining offices at that time. During its *Pennsylvania Bulletin* review, DRN noted that the Cambria District Mining office issued two discharge permits that included requirements for wastewater and stormwater to be handled with nondischarge alternatives and without point source discharges. A review of an application or applications submitting *Anti-Degradation Supplement for Mining Permits* would be necessary to determine whether applicants complete the nondischarge alternative analyses as instructed, whether any impact on the types of mining operations to permitting would be observed, or whether the new form serves only as a perfunctory checklist procedure that ultimately fails to maintain and protect HQ and EV waters.

SEJ Rulings Disclaimer

Historically, SEJ reviews were not undertaken by the Bureau of Oil and Gas Management because permit applications for discharges of wastewater generated from the oil and gas extraction activities were uncommon (NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities would be processed and issued by the conservation district or the regional DEP office). DRN did not look at any SEJ reviews undertaken by the Bureau of Oil and Gas Management.

SEJ: Public Participation

Federal antidegradation policy requires public participation and intergovernmental coordination in the SEJ review process. Although some SEJ reviews were published in the *Pennsylvania Bulletin*, review of the centralized file showed that notice of a SEJ review did not appear in each application where SEJ was reviewed. In the SEJ review for the Milford-Trumbauersville Area Sewer Authority Wastewater Treatment Plant (NPDES Permit No. PA0042021) that DRN examined, no documentation regarding intergovernmental coordination was observed. Other than publication of applications and actions in the *Pennsylvania Bulletin*, opportunities for public participation appeared limited. In the Module 24 Special Protection Waters examined by DRN, a public hearing had been requested, but as of this writing no hearing has been held.

Review: The Effectiveness of Stream Designation

Federal policy calls for a consideration of the water quality standards of downstream segments when permitting upstream activity to ensure that downstream uses are maintained.¹³⁰ This would suggest that permitting of activity in stream segments upstream of HQ or EV waters must take into consideration protection of those uses. Pennsylvania uses a waterbody-by-waterbody approach for designated uses determinations, but does not necessarily assign HQ or EV status to an entire watershed. This approach

¹²⁹ To prove the discharge will be non-degrading, applicants are instructed to use existing monitoring data to calculate the non-degrading effluent limits for the proposed discharge. They are to then describe the technology and practices that will be used to achieve these effluent limits and assess the costs.

¹³⁰ §131.10. Designation of uses.

fragments protections for streams and has the potential of permitting upstream activities that result in degrading impacts to downstream HQ and EV segments or even petitions for the removal of the downstream uses.

DRN reviewed, stream by stream, the designations of all waters in the Schuylkill River watershed.¹³¹ The most striking example of fragmentation of stream designation/protection in the Schuylkill River watershed is Hay Creek, but DRN noted another stream with fragmented protection. Monocacy Creek, a Schuylkill River tributary, is designated as a Warm Water Fishery. One of the Monocacy's unnamed tributaries is also designated Warm Water Fishery except for a segment that runs from 40 meters upstream of the SR2023 bridge crossing (at river mile 0.75) to the confluence with Monocacy which has an existing use designation of HQ-Cold Water Fishery.¹³² This results in a Warm Water Fishery segment feeding an HQ segment with the potential for upstream activity to degrade the downstream segment.

The West Branch Perkiomen basin from the source to SR 1022 bridge (river mile 12.9) is designated Cold Water Fishery. Then the designation for the basin from the SR 1022 bridge to SR 2069 bridge (river mile 8.0) is EV. Below the SR 2069 bridge, the basin is again a Cold Water Fishery. Once again, fragmentation presents the potential for upstream activity to degrade a downstream segment.

The benefit of avoiding fragmented use designations, in particular assigning less protective designations to reaches upstream of more protected uses, would seem to be the best way to comply with federal antidegradation policy that requires consideration of the water quality standards of downstream segments. However, as recently as 2010, a portion of French Creek (Berks and Chester Counties) received a use designation upgrade by the EQB in response to a petition submitted by the Green Valleys Association. DEP recommended, and the EQB approved, upgrading the lower sections of the main stem French Creek, but the use designation of many small tributaries that feed the main stem were not upgraded, limiting the protection afforded the main stem by the upgrade.

A number of headwater streams in the Schuylkill River watershed have a more protective designation upstream, however the division between the HQ segment and the downstream segment was frequently a dam (e.g., Schuylkill County's Tar Run, a tributary of Mill Creek, is an HQ-cold water fishery for the entire basin from its source to the Schuylkill County Municipal Dam). Below the dam, it is a cold water fishery. Technically, that makes the impoundment HQ, but DEP has asserted in several use attainability analyses that impoundments cannot achieve a designation like HQ-coldwater fishery. This sets up a situation where an interested party could petition the EQB, asserting the impoundment was wrongly classified, and request a redesignation. But rather than granting a downgrade in the designated use the more appropriate approach would be to take the steps necessary to protect the HQ or EV designation such as removing the dam impounding the stream (dams are often the cause of the higher temperatures and poor water quality conditions).

Rattling Run, a tributary of the Little Schuylkill River, is designated EV for the entire basin from the source to Pennsylvania Route 61. Then it becomes a Cold Water Fishery. The EV designation upstream

¹³¹ §93.9f. Drainage List F.

¹³² PA DEP. 2009. Statewide Existing Use Classifications: Berks County. Retrieved from [http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Existing%20Use/Co06\(Berks\).pdf](http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Existing%20Use/Co06(Berks).pdf).

of a road impact raises the question as to whether Pennsylvania Route 61 is the degrading factor. Should Rattling Run downstream of Pennsylvania Route 61 be considered an impaired EV segment that should be restored? DEP has stated that only 714 miles, or 0.8% of all of Pennsylvania's stream miles that are presently classified EV are also designated as impaired,¹³³ but these numbers would not include streams like the Cold Water Fishery segment of Rattling Run.

Does that mean that for those streams with HQ or EV designation, the implementation of Pennsylvania's antidegradation policy is achieving the maintenance and protection of water quality desired for the Commonwealth's cleanest streams? The Stroud Water Research Center (SWRC) recently attempted to answer this question, but it determined that it could not be answered due to a lack of data.¹³⁴ The data necessary to answer the question were not available because no follow-up monitoring program exists to track trends in stream health. Without a regular monitoring program where the benthic community is examined every few years for these EV designated streams, there is no way of knowing whether Pennsylvania's antidegradation policy or implementation procedures are adequately protecting the Commonwealth's cleanest streams or whether more than 714 miles of EV streams are impaired. SWRC's search of available data indicates that DEP has monitored few HQ or EV waters in the Schuylkill basin with any regularity.

Although SWRC was unable to find sufficient data to answer the general questions regarding the effectiveness of stream designations for protecting stream health, sufficient data was available to answer this question for one EV stream, the Schuylkill River's Valley Creek tributary. The entire Valley Creek basin was designated EV in 1993. But studies conducted only ten years later found that macroinvertebrate populations may have actually declined. Furthermore, the watershed's wild brown trout population—the presence of which was a factor in securing the EV designation—was found to be smaller, less widely distributed and its physical condition had declined since 1993.¹³⁵

DEP, following a recommendation of the Pennsylvania Campaign for Clean Water, had proposed a pilot monitoring initiative to track trends in the health of HQ or EV waters in 2008. Under this approach, called the Healthy Waters Initiative, DEP would collaborate with citizen watershed organizations to undertake monitoring in a select group of HQ and/or EV watersheds in each region. In addition to serving as an early warning system for degradation of water quality, this initiative would serve as a test of the effectiveness of Pennsylvania's antidegradation policies and implementation procedures.

DRN has been moving forward in this pilot monitoring initiative by conducting its own monitoring in one of the selected watersheds, Crum Creek in Chester County. In May 2008, 2009 and 2010, DRN conducted macroinvertebrate monitoring at one station in the West Branch Crum Creek basin, designated EV in 2003, and at two stations in the upper reaches of the main branch of Crum Creek, designated HQ. In 2009 and 2010, a fourth sampling station on the Crum Creek main stem downstream of the West Branch confluence was added. DRN's monitoring replicated the location, methodology and the timing of monitoring undertaken by DEP in 2000 after an upgrade petition for Crum Creek was

¹³³ 40 Pa.B. 4861.

¹³⁴ Stroud Water Research Center. 2009. Understanding Stream Conditions: Lessons from an 11-Year Study of Macroinvertebrates in Eastern Pennsylvania's Schuylkill River Watershed, with a Focus on Exceptional-Value and High-Quality Streams. Retrieved from http://www.stroudcenter.org/schuylkill/Schuylkill_Summary.pdf.

¹³⁵ Stroud Water Research Center. 2009. Understanding Stream Conditions: Appendices, Lessons From An 11-Year Study Of Macroinvertebrates In Eastern Pennsylvania's Schuylkill River Watershed, With A Focus On Exceptional-Value And High-Quality Streams. Retrieved from http://www.stroudcenter.org/schuylkill/Schuylkill_Appendix.pdf.

accepted for study by the EQB. The antidegradation assessment conducted by DEP in 2000 at these same stations produced diverse and healthy populations of macroinvertebrates resulting in a recommendation to upgrade the use designation of the West Branch Crum Creek basin to EV and the retention of the HQ use designation for the remainder of the basin.

Comparison of DEP's 2000 data with DRN's data for Crum Creek reveals that significant differences exist between the West Branch Crum Creek aquatic community found in 2000 and that found during the three years of DRN's monitoring. These differences suggest that use degradation is occurring. The Hillsenhoff Biotic Index (HBI) also suggests degradation along both the West Branch Crum Creek and the main stem. The HBI was originally developed to indicate organic pollution and considers the abundance of taxa¹³⁶ and their tolerance to environmental stress and water quality. A lower HBI score signifies better water quality.

The HBI score for the West Branch Crum Creek site was 6.6 in 2008, 5.8 in 2009, and 5.6 in 2010. These scores represent significant increases from the West Branch's 2000 HBI score of 2.2 (Increases in HBI scores signify degradation of water quality and stream health). During the three years of DRN's monitoring, the HBI score for the EV designated West Branch's HBI was higher (indicating poorer water quality) than the HBI for either of the two HQ designated Crum Creek stations. By contrast, the West Branch produced the best HBI score of the three stations sampled during DEP's 2000 antidegradation assessment.

Similar increases in HBI scores in 2008, 2009, and 2010 were also observed at the two main stem Crum Creek stations where sensitive species were reduced in numbers. This data indicates a potential decline in quality for all three sample stations over time. Based on DRN's 2008, 2009, and 2010 data, this pilot monitoring effort suggests that Pennsylvania's antidegradation policies and implementation procedures are inadequate to maintain and protect the existing use designations as required under the Clean Water Act.

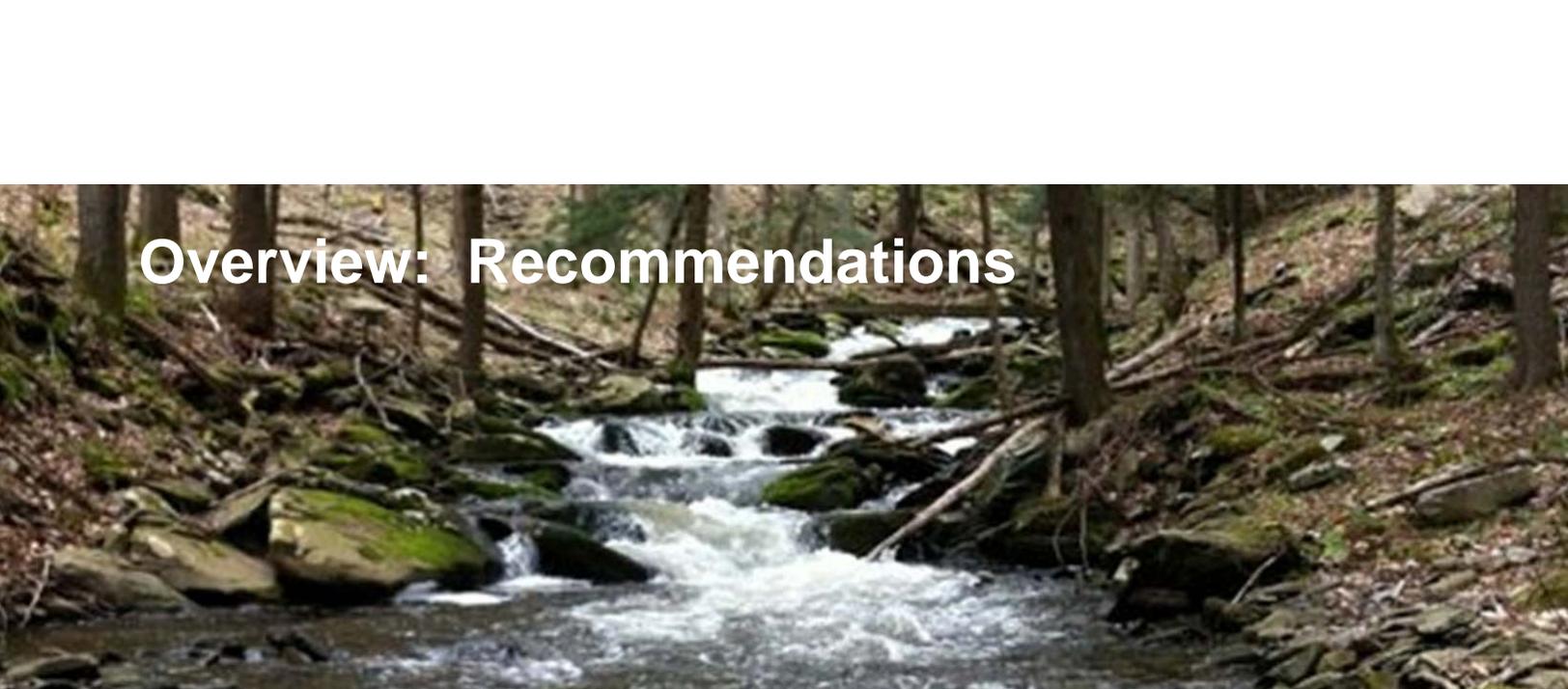
During its 2008 Crum Creek monitoring effort, DRN also undertook an assessment habitat survey along the entire West Branch and found intensive mowing practices and lack of riparian buffers, factors that could be contributing to the decline of the West Branch. The science is clear that a forested riparian buffer protects stream health. SWRC, drawing on its eleven year macroinvertebrate study of the Schuylkill River basin, determined that the primary factor governing macroinvertebrate assemblages was forest cover, and that increased forest cover resulted in improved water quality and biological diversity.¹³⁷

DEP's Healthy Waters Initiative has moved forward marginally in other regions to examine other special protections streams and the Pike County Conservation District is another DEP partner assisting with studies of the Little Bushkill Creek, another stream in a watershed undergoing changes. Another stream being investigated by DEP is Kooser Run. DEP staffing requirements make partnership with outside entities key to ensuring progress is made to monitor our cleanest streams. Because of the need

¹³⁶ The term "taxa" refers to a specified classification level of organisms of the same biological rank (e.g., family, genus or species).

¹³⁷ Stroud Water Research Center. 2009. Understanding Stream Conditions: Lessons from an 11-Year Study of Macroinvertebrates in Eastern Pennsylvania's Schuylkill River Watershed, with a Focus on Exceptional-Value and High-Quality Streams. Retrieved from http://www.stroudcenter.org/schuylkill/Schuylkill_Summary.pdf.

for DEP and its Healthy Waters Initiative partners to focus on monitoring HQ and EV streams now under increased pressure from gas drilling, other streams may not be monitored. These other streams may be on their way to impairment or may already be impaired and, without data available on stream health, opportunities to prevent impairment or undertake restoration are being missed. Based on the Crum Creek results, DEP began working with DRN in 2010 on efforts to help improve conditions for this watershed through riparian buffer projects. DEP also provided funding to cover the cost for DRN's 2010 monitoring effort.



Overview: Recommendations

Some states that have yet to fully implement an antidegradation policy and program have looked to Pennsylvania for guidance and DEP would like to see its program regarded as a model for other states to follow (PA DEP staff, Personal Communication, 9 September 2010). But to be a leader in antidegradation, Pennsylvania's policy and program must evolve to reflect the growing understanding of and appreciation for the need to provide stronger protections for our streams. Today's program is not doing the job. Other states are considering, adopting, and/or implementing provisions that reflect improved understanding of river functions; that better recognize how what we do on the land affects water quality and quantity; that reflect the economic, environmental, health and community benefits of protecting clean water.

DRN's review of various aspects of Pennsylvania's antidegradation program has provided insight into some areas where the program can be improved to provide better protection for the Commonwealth's cleanest streams:

- Trends in the condition of Crum Creek suggest that EV designation alone is inadequate to maintain and protect the existing use designations as required under the Clean Water Act. Legal action and decisions by the EHB also validate this point.
- More resources must be made available to ensure we have the data necessary to protect our cleanest streams from degradation.
- More funding is necessary to support DEP's antidegradation program staffing needs.
- The changing nature and format of media present opportunities and challenges for meaningful public participation in the decision-making that affects HQ and EV streams.

We can and must do more to maintain and protect the water quality of Pennsylvania's HQ and EV streams.

DRN is proposing action steps to achieve better protection for EV and HQ streams. These suggested actions come out of our review of Pennsylvania's antidegradation policy and program as well as our review of the antidegradation policies and implementation procedures of other states.

Our proposed actions fall into the following categories:

- ❖ Monitoring for Designated and Candidate HQ/EV streams
- ❖ HQ/EV Designation Protection

- ❖ Updated Policy on Dam Impacts
- ❖ Drinking Water Supply Protection
- ❖ Threatened and Endangered Species Protection
- ❖ Non-Degrading Discharges and Degrading Discharges
- ❖ Meaningful Public Participation in Decision-Making
- ❖ Habitat Protection and Restoration

DRN has identified action steps in support of these suggestions that can be implemented at the federal (requires changes in federal policies or programs), state (requires changes in state policies or programs), and community (requires coordinated action by local government or citizen groups), level as well as action steps for individuals.

Not all categories include actions steps at all levels, but the action steps presented here demonstrate that significant opportunities exist for individuals and organizations and at all levels of government to bring about real change that will benefit Pennsylvania's cleanest streams.

❖ **Monitoring for Designated and Candidate HQ/EV streams**

To comply with requirements of section 305(b) of the Clean Water Act, the EPA encourages states to accomplish comprehensive monitoring of all waters over a five year cycle or less.¹³⁸ However, a search of available DEP data by the SWRC indicated that the agency has, to date, monitored few HQ or EV waters in the Schuylkill basin with this frequency.¹³⁹ Going forward, DEP has suggested that it will conduct probabilistic monitoring¹⁴⁰ on a five year schedule.¹⁴¹ DEP has indicated targeted monitoring would be undertaken “on a case by case basis dependent on TMDL schedules, regional priorities, BMP implementation and compliance monitoring frequency needs.” This language suggests the focus of DEP’s targeted monitoring will be impaired streams to the detriment of HQ and EV waters.

HQ and EV waters must also be monitored regularly, ideally at least once a year particularly in watersheds where change in landuse is occurring to ensure that the changes are not causing degradation (SWRC, Personal Communication, 2 December 2010). Every other year would be sufficient for streams that are not experiencing rapid changes. Monitoring a site once every five years yields insufficient data points to gauge all but the most dramatic changes in stream health that may occur. Monitoring a site every ten years, which has occurred at some sites, provides even fewer data points for gauging stream health.¹⁴² DRN’s study of Crum Creek (see pp. 34-35) suggests that a designation of HQ and EV alone is not sufficient to ensure that changing landuse, even with the implementation of special protection BMPs, will not result in lowered water quality. HQ and EV streams in watersheds where landuse is experiencing rapid changes should be identified and targeted for annual benthic monitoring to ensure that these streams are not degrading over time.

Because of the potential for gas drilling to change the landscape where it occurs, annual monitoring is especially important in HQ and EV watersheds where that activity is occurring or planned to occur. The requirement to fund annual monitoring could be made a stipulation for gas drilling permits in order to make the industry help bear the cost of this increased and necessary oversight. If the industry wants to develop in EV and HQ streams, then they need to bear the additional costs to ensure their activities are not degrading our cleanest streams.

In a 2005 report, DEP indicated that eight full time staff were fully dedicated to conducting stream assessments. The agency estimated that it would need double the number of monitoring staff to complete recurring assessments for a five to ten year time period.¹⁴³ Recent budget cuts at DEP suggest that an increased commitment of staff time for monitoring is unlikely to happen. A 27% budget cut for

¹³⁸ US EPA. 1997. Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates. Retrieved from

http://water.epa.gov/type/watersheds/monitoring/upload/2003_07_24_monitoring_305bguide_v1ch1.pdf.

¹³⁹ Stroud Water Research Center. 2009. Understanding Stream Conditions: Lessons from an 11-Year Study of Macroinvertebrates in Eastern Pennsylvania’s Schuylkill River Watershed, with a Focus on Exceptional-Value and High-Quality Streams. Retrieved from http://www.stroudcenter.org/schuylkill/Schuylkill_Summary.

¹⁴⁰ Probabilistic monitoring involves monitoring of randomly selected, statistically representative stations that can be used to predict the water quality of other rivers and streams in their watersheds.

¹⁴¹ PA DEP. 2008. Public Participation Comment/Response Document for the 2007 Assessment and Listing Methodology.

¹⁴² Stroud Water Research Center. 2009. Understanding Stream Conditions, Lessons from an 11-Year Study of Macroinvertebrates in Eastern Pennsylvania’s Schuylkill River Watershed, With a Focus on Exceptional Value and High Quality Streams. Retrieved from http://www.stroudcenter.org/schuylkill/Schuylkill_Summary.pdf.

¹⁴³ PA DEP. 2005. Elements of Pennsylvania’s Monitoring and Assessment Program. Retrieved from http://www.epa.gov/reg3wapd/monitor/pdf/pa_strategy.pdf.

2009-2010 was followed by a nine percent budget cut for 2010-2011^{144,145,146} resulting in a smaller inflation-adjusted budget than a decade ago even as DEP is faced with expanded responsibilities associated with proposed and ongoing natural gas drilling in the Marcellus Shale (much of which is expected to occur in HQ and EV watersheds). In November 2009, DEP laid off 138 employees. Along with the apparent elimination of an additional 120 unfilled vacancies, the total number of DEP staff has shrunk from 3,011 to 2,760, which represents an eight percent reduction in personnel.^{147,148} Maintaining positions in inspection and enforcement was given the highest priority suggesting ambient monitoring and assessment functions are a lower priority.

A record number of gas drilling permits are being issued in HQ and EV watersheds, but, with no stream surveys required under general permitting for associated earth disturbance activities for sites under five acres, little oversight, and no monitoring of BMPs implemented, it is unlikely we will know when our EV and HQ streams begin to be affected until degradation has occurred. DRN's position is that unconventional gas drilling should not be allowed in special protection watersheds, but if it is continued to be allowed, permit applicants should have to pay increased fees to cover the increased need to monitor and protect our HQ and EV streams.

A dedicated source of funds to support both regular stream assessments and special protection surveys is needed to ensure that our cleanest streams are protected. Methods of raising dedicated revenues might include: a severance tax on gas drillers; charges for services such as user fees; charges for watershed degradation such as surcharges or impact fees; or fines.¹⁴⁹ Funding mechanisms for monitoring have been established in other states through sales of lake and stream stickers,¹⁵⁰ through fees on pesticide registration fees,¹⁵¹ and disposal of construction and demolition debris.¹⁵² DEP has modified permitting fees for gas drillers linking them to the length of the bore hole, but these funds are used to support the new DEP oil and gas permitting staff required.

One \$25,000 bonding fee for operation and restoration allows operators to drill as many wells as possible.¹⁵³ This amount is inadequate considering the risks taken and the extent of drilling expected. A

¹⁴⁴ Bauers, Sandy. Pa. Budget Cuts Hamper Environmental Protection, Philadelphia Inquirer. Retrieved from <http://www.philly.com/philly/news/homepage/65889407.html?cmpid=15585797>.

¹⁴⁵ Worden, Amy. 17 November 2009. More Layoffs for Pa. State Workers, Philadelphia Inquirer. Retrieved from http://www.philly.com/inquirer/local/20091117_More_layoffs_for_Pa_state_workers.html.

¹⁴⁶ Mocarsky, Steve. July 1, 2010. Group Criticizes DEP Budget Cut, Times Leader. Retrieved from http://www.timesleader.com/news/Group_criticizes_DEP_budget_cut_06-30-2010.html?searchterm=budget.

¹⁴⁷ Bauers, Sandy. 24 October 2009. Pa. Budget Cuts Hamper Environmental Protection, Philadelphia Inquirer. Retrieved from <http://www.philly.com/philly/news/homepage/65889407.html?cmpid=15585797>.

¹⁴⁸ Worden, Amy. 17 November 2009. More Layoffs for Pa. State Workers, Philadelphia Inquirer. Retrieved from http://www.philly.com/inquirer/local/20091117_More_layoffs_for_Pa_state_workers.html.

¹⁴⁹ Last, Tristan. 3 and 4 October 2007. Economic and Social Benefits of Water Quality: Creating Sustainable Funding for Watershed Quality. Presentation at Salt Lake Countywide Watershed Symposium. Salt Lake City, Utah.

¹⁵⁰ Maine Revised Statute Title 38, Chapter 20-A: Program To Prevent Infestation Of And To Control Invasive Aquatic Plants. 2010. Retrieved from <http://www.mainelegislature.org/legis/statutes/38/title38ch20-A.pdf>.

¹⁵¹ Minnesota Department of Agriculture. 2009. Pesticide Program Funding. Retrieved from <http://www.mda.state.mn.us/en/news/government/~media/Files/news/govrelations/pesticideprogfunds.ashx>.

¹⁵² LAW Writer® Ohio Laws and Rule. 22 December, 2005. Ohio Revised Code, Title 37, Chapter 3714: Construction and Demolition Debris. Retrieved from <http://codes.ohio.gov/orc/3714.071>.

¹⁵³ Roberts, Scott. 28 September 2010. Testimony before Philadelphia Council Hearing, Joint Committees on Transportation and Public Utilities and Environment. Retrieved from <http://legislation.phila.gov/transcripts/Public%20Hearings/environment/2010/en092810.pdf>.

full cost bonding approach with fees appropriate to the total number of sites drilled and restoration costs that will be involved as well as long-term monitoring needs should be adopted.

In Pennsylvania's Bedford County, an organized citizen's group called the Bob's Creek Stream Guardians was able to negotiate with Chief Oil & Gas to secure \$10,000 to support two sondes to monitor Bob's Creek upstream and downstream of the pad site near Blue Knob State Park which is in a reach of the Bob's Creek basin that is designated HQ-Cold Water Fishery. Bob's Creek is also a state-designated Class A trout stream. Volunteers from the Guardians installed the sondes which measure pH, temperature and conductivity every 15 minutes. Data from the sondes is downloaded every two weeks and sent to DCNR and DEP. Several infractions in May 2011 were picked up from this stream monitoring with spikes in TDS that were tracked back to holes in the liner at the drill site. Citizens groups in other parts of Pennsylvania could work to duplicate this same effort for any discharger, but it should be required as part of the permitting process in HQ and EV watersheds. Monitoring maintenance costs should also be the responsibility of the gas company or other discharger. It should be noted that maintenance reagent and equipment needed since the Bob's Creek Stream Guardians installed their sonde (January 2010) have *not* been paid for by Chief Oil & Gas.

Trained volunteers can also be used to help monitor the health of Pennsylvania's streams. Pilot Healthy Waters Initiatives between DEP and other entities such as DRN and the Pike County Conservation District can be used to begin assessing several changing watersheds that are EV to see how well the streams are maintaining their special protection over the years. Although the Healthy Waters Initiative exists and some work has been done in Crum, Little Bushkill, and Kooser watersheds, limited resources and staff have been a barrier to expanding this program. DEP should continue to work with watershed organizations and individual volunteers to aggressively expand the Healthy Waters Initiative to undertake monitoring of HQ and EV streams. Aggressive expansion of this program could help to ensure that HQ and EV streams are not allowed to degrade especially while DEP priorities are focused elsewhere.

DEP currently uses a BCG for impairment assessments and integrated stream listing purposes. The IBI score resulting from these stream assessments are plotted against a gradient from zero to 100, upon which thresholds, or benchmarks, have been established for aquatic life use attainment levels. For the Cold Water Fishery use, a stream scoring 63 or higher is considered to be attaining its designated use. The proposed benchmark for HQ/EV use is a score equal to or greater than 80.¹⁵⁴

However, DEP has stated that an assessment of an HQ/EV designated stream returning an IBI score below 80 will not necessarily result in that stream being considered impaired.¹⁵⁵ Instead, DEP proposes using as the threshold for impairment the stream's IBI score plus or minus 11 IBI points. The reason for this is that DEP considers 11, on a scale of zero to 100, to be the precision of the dataset used to develop the IBI.

¹⁵⁴ PA DEP. 2009. An Index of Biotic Integrity for Wadeable Freestone Riffle-Run Streams in Pennsylvania. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Methodology/rifflerubfreestone_2009am.pdf.

¹⁵⁵ PA DEP. 2009. A Benthic Index of Biotic Integrity for Wadeable Freestone Riffle-Run Streams in Pennsylvania. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/ibi_riffle_run2009.pdf.

Under DEP's proposed approach, a stream scoring 85 on its special protection survey would not be considered impaired until later surveys produce an IBI score less than 75. But following DEP's logic, it could be argued that the real IBI of the stream scoring 85 on its special protection survey was actually 96. Allowing an 11 point drop in a stream's measured IBI score before an impairment determination is triggered is neither protective of the HQ or EV use, nor in keeping with the spirit of federal antidegradation requirements. Action should be taken to protect the HQ/EV designation before the measured IBI is allowed to drop by 11 points.

Even small drops in measured IBI for HQ and EV streams should not be ignored when the stream's watershed has undergone development. It is possible the real IBI has dropped if the watershed is developing rapidly even if the measured IBI hasn't dropped. Given the infrequency of monitoring that DEP is likely to undertake, the potential for impairment to not only occur but to go unchecked in HQ or EV watersheds with rapidly changing landuse is very real (e.g., Crum Creek, Valley Creek). Considering the close relationship between forest cover and stream health, DEP should use an evaluation of landuse/land cover data as a preliminary check of possible impairment of HQ and EV watersheds in addition to consideration of changes in a stream's measured IBI score.

DEP also needs to expand the number of ecotypes of reference waters to be used for Pennsylvania streams for both impairment and special protection surveys. Pennsylvania's *Water Quality Antidegradation Guidance Manual* specifies detailed requirements for reference stream selection. Every effort is to be made to match the natural conditions of the candidate stream with a reference. The two streams should possess the same, or very similar, characteristics when in a natural condition. Although DEP recognizes that regional differences may be present in a state as large as Pennsylvania, only one IBI has been developed. By comparison, the significantly smaller state of New Jersey has developed three indices to best evaluate the different physiographic regions of that state: a High Gradient Macroinvertebrate Index (HGMI) for streams of the Highlands, Ridge and Valley, and Piedmont; a Coastal Plain Macroinvertebrate Index (CPMI) for the Coastal Plain excluding the Pinelands; and the Pinelands Macroinvertebrate Index (PMI).¹⁵⁶ The Ohio Environmental Protection Agency created three different IBIs, for headwater streams (those with drainage area less than 20 square miles), wadeable sites, and larger non-wadeable sites.¹⁵⁷ In addition, Ohio modified its BCG for Ohio's five different ecoregions.

There is demonstrable taxa variation across Pennsylvania (SWRC, Personal Communication, 16 July 2009) and DEP has indicated that in locations like Monroe County, where conservation district staff have begun using the new IBI, they already see where additional indices will be needed to accurately assess streams in different ecoregions (PA DEP staff, Personal Communication, 16 July 2009). Macroinvertebrate data collected in 2009 by the SWRC indicate that regional benchmarks may also be needed to fairly test streams in different physiographic regions of Pennsylvania.

Adjustments are also needed in the metrics to be used in the IBI if it is to be used for special protection surveys. As the DEP has begun using the new IBI in impairment assessments and for integrated stream

¹⁵⁶ New Jersey Department of Environmental Protection. 2008. New Jersey Integrated Water Quality Monitoring and Assessment Report, 2008 DRAFT. Retrieved from http://www.state.nj.us/dep/wms/bwqsa/draft_2008_integrated_report.pdf

¹⁵⁷ US EPA. 2011. Identifying and Protecting Healthy Watersheds - Concepts, Assessments, and Management Approaches (DRAFT).

listing purposes, agency staff are finding that smaller streams may be being penalized because two or three of the metrics in the new IBI are heavily influenced by diversity (PA DEP staff, Personal Communication, 16 July 2009). If a stream does not have 14 to 16 taxa, it is unlikely to obtain a score of 63 or higher. Also, mayflies appear to drive the new IBI; if mayflies are missing from the stream, the IBI scores are greatly affected, reducing the likelihood of achieving a score of 63 against the BCG. A stream that does not achieve a score of 63 or higher could be listed as impaired. For example, a special protection survey of an unnamed tributary included in the petition to upgrade Beaver Run and the lower French Creek did not return the score necessary to achieve EV status. Despite the presence of a large number and diversity of stoneflies, usually considered among the sensitive taxa, the stream did not score highly enough to achieve the EV designation. Specifically, the unnamed tributary fared poorly on only one metric—percent modified mayflies—when compared to the reference station.¹⁵⁸ On all other metrics, the unnamed tributary compared favorably to the reference station.

Recommendations

State Level

- Establish a dedicated funding mechanism to support both regular stream assessments and special protection surveys.
- Ban unconventional gas drilling in special protection watersheds or, if it continues to be allowed, require permit applicants to pay increased fees to cover costs of monitoring and protecting HQ and EV streams.
- Focus targeted monitoring on HQ and EV streams in watersheds where landuse is experiencing rapid changes.
- Monitor HQ and EV streams every year in watersheds experiencing rapid landuse changes and every other year in watersheds where land use is stable.
- Expand monitoring capability by requiring permittees to underwrite the costs for citizen groups to acquire, install and maintain sondes in order to monitor stream impacts when activities like gas drilling are proposed for HQ and EV watersheds.
- Aggressively expand the Healthy Waters Initiative.
- Use an evaluation of land use/land cover data as a preliminary check of possible impairment of HQ and EV watersheds in addition to consideration of changes in a stream's measured IBI score.
- Expand the number of regional indices to be used for impairment and antidegradation assessments in Pennsylvania streams.
- Adjust the metrics selected to produce the IBI score to prevent small streams from being penalized.
- Ensure public comment opportunity is offered before ICE data analysis guidance is adopted for use with stream redesignations.

Community Level

- Provide funding to and partner with local nonprofit watershed associations for monitoring support to supplement datasets and the protection of HQ and EV streams.

¹⁵⁸ PA DEP. 2010. Water Quality Standards Review Stream Redesignation Evaluation Report: French Creek and Beaver Run, Chester County. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/Fishing%20Creek/French_Creek_and_Beaver_Run_Report.pdf.

Individual Level

- Contact DEP and ask what additional data is available for HQ and EV streams since its initial designation and how the stream is trending over time
- Volunteer with a local or regional water protection organization or the DEP to become trained in macroinvertebrate monitoring protocols and monitor the health of your local HQ or EV stream.
- Review the *Pennsylvania Bulletin* for notices of applications to discharge to HQ or EV streams in your watershed. Check to make sure that individual permits are being required and that no waivers are being allowed.
- When you read about notices of applications to discharge to HQ or EV streams in your watershed, be sure to comment and request a public hearing for large projects. Also, involve other water protection organizations in your efforts.
- Urge DEP to expand the number of regional indices and BCGs for different parts of the state and ecoregions.
- Speak with your local representatives to educate them about the importance and value of HQ and EV streams and why protection of these streams is critical to downstream users.
- Insist DEP require monitoring of your HQ or EV stream before a major landuse change like gas drilling or a major development impact is allowed.

❖ HQ/EV Designation Protection

In Pennsylvania, water quality is said to be “locked in” and should never be allowed to decline below the criteria necessary for it to sustain the uses actually attained in the waterbody on or after November 28, 1975.¹⁵⁹ However, DEP staff have stated that when a petition to change a stream’s designation is accepted for study, an analysis to evaluate whether a stream reach was initially properly designated is also performed.¹⁶⁰ This approach raises concerns that DEP may also be considering “correcting” or downgrading streams designated EV or HQ to less protective uses.

Some of Pennsylvania early designations of HQ and EV streams followed a waterbody-by waterbody approach based upon previously identified “conservation areas” (PA DEP staff, Personal Communication, 9 September 2010), a designation that did not arise from direct measure of overall stream condition. Therefore, at the time of their designation, the measured IBI scores of these early HQ and EV streams are unknown (PA DEP staff, Personal Communication, 9 September 2010). Recently, DEP has stated that there may be exceptional circumstances when follow-up monitoring of an HQ or EV stream may result in a low IBI score “when the stream never deserved special protection status.”¹⁶¹ This statement suggests that DEP may regard today’s low measured IBI score as justification to “correct” a stream’s designation and therefore redesignate it downward to a lower tier of protection rather than consider it an HQ or EV stream that has become impaired and in need of restoration. Downgrading a stream’s designation under these circumstances would run contrary to the spirit of both federal and Pennsylvania’s antidegradation policy.

While DEP may take the position that some waterways were improperly designated years ago, an equally likely scenario is that impacts in the years since the original HQ or EV designation have degraded the waterbody to the point that it no longer meets its use designation. For additional support for an HQ or EV designation today based upon the boundaries of these early Conservation Areas, we must look back to the DEP’s predecessor agency, the DER which was split in 1995 into DEP and the DCNR.

Today, DCNR responsibilities include maintaining and preserving State parks; managing State forest lands; and promoting conservation of rivers, trails, greenways, local parks and recreation, regional heritage parks, open space and natural areas, but when the Conservation Areas were used as the basis for early HQ and EV designations, DER had those responsibilities. The current criteria for qualifying as an EV water include location in a designated State park natural area, State forest natural area, or State wild river. The early HQ and EV designations should be considered to qualify for special protections as designated Conservation Areas, so designated by the predecessor to today’s DCNR.

¹⁵⁹ In §93.4(c), regulations for statewide water uses is intended to prevent waters considered for redesignation from being redesignated to less restrictive uses than the existing uses. Neither should a downgrade of a stream’s designated use be allowed if its existing use is lower than its designated use. When the existing use is lower than the designated use, the designated is the water quality goal to be met through restoration activities.

¹⁶⁰ PA DEP. 19 August 2008. Environmental Quality Board Meeting Minutes. Retrieved from http://www.portal.state.pa.us/portal/server.pt/community/environmental_quality_board/14005/eqb_meeting_schedule_2008/589179#09162008.

¹⁶¹ PA DEP. 2009. A Benthic Index of Biotic Integrity for Wadeable Freestone Riffle-Run Streams in Pennsylvania. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/ibi_riffle_run2009.pdf.

Degradation has been observed in streams that have achieved EV designation (e.g., Crum Creek, Valley Creek). When an HQ or EV stream, without historic water quality data, is found to have existing water quality below that needed to meet its HQ or EV use, the assumption should be that special protection designation was correct, but that degradation has been allowed to occur, particularly if development has occurred in the watershed since the water was first designated. When a stream is found to have existing water quality below that needed to meet its HQ or EV use, DEP should supplement monitoring data with a comparison of current and pre-designation landuse/land cover data to determine whether changing land use may have contributed to the decline.

Waterways with water quality below that needed to meet their HQ or EV use should be added to the 303(d)/305(b) Integrated List and a Total Maximum Daily Load crafted and implemented in order to restore the waterway to its designated use in the coming years. With budget cuts, staffing vacancies, and the demands of gearing up to regulate natural gas development, limited DEP staff time should not be committed to the time-consuming UAAs necessary to downgrade a stream's use designation, especially when use designation petitions submitted to protect our cleanest streams with upgrades languish. The agency charged with keeping our clean streams clean should focus on strengthening our protections rather than weakening them. The commitment required to perform a UAA is considerable as the DEP is required to prove not only that the stream in question never had water quality supporting the initial special protection use, but also that the stream could never again be restored to that existing use. Both points are difficult to prove.

In addition, the fragmentation of special protection designation puts those uses at risk. Fragmented protection could allow permitting of upstream activities that would result in degrading impacts to downstream HQ and EV segments or even petitions for the removal of the downstream uses. Pennsylvania uses a waterbody-by-waterbody approach for designated uses determinations. Moving toward providing special protection on a whole watersheds basis, rather than segmenting stream protection or overlooking tributaries streams, is more in the spirit of Pennsylvania's waterbody-by-waterbody approach to use designations.

Recommendations

State Level

- Prevent redesignation (i.e. downgrades) of legacy HQ or EV streams to less protective uses.
- Add legacy HQ or EV streams not meeting their designated use to the list of impaired streams needing a TMDL.
- Provide special protection designation on a whole watersheds basis and ensure that upstream reaches do not have less protective designated uses than the downstream segments into which they flow.

Individual Level

- Examine the rationale and science behind any UAAs prepared for HQ or EV streams in your watershed and comment on the proposed stream downgrade.
- Question DEP rationale behind fragmenting stream designations in your watershed by citing the scientific research available on the importance of headwater areas to stream health.

❖ Updated Policy Regarding Dam Impacts

Dams affect water quality by negatively affecting water temperature, dissolved oxygen content, and turbidity. The impoundments that dams create often act as heat sinks, increasing downstream temperatures to unnaturally high levels that can stress aquatic life. Impoundments can also become nutrient sinks and places of low dissolved oxygen affecting downstream water quality and further stressing aquatic life. Because of these impacts, dams are not compatible with federal antidegradation policies to protect and maintain water quality in Tier 2 and Tier 3 waters.

At the time the Clean Water Act was passed, dam removal was only beginning to come into its own as a river restoration tool. The concept of damming rivers for economic benefits persisted into the 1970's even as a call for re-evaluation of the supposed benefits of dams began to be heard. Dam construction always had opponents, but the environmental regulations of the 1970's offered new tools to combat the building of new dams. Although it would eventually be constructed, the Tellico dam proposed for the Little Tennessee River was stalled for a time by the Endangered Species Act (ESA) until legislation exempting Tellico from the ESA was passed.¹⁶² Opponents to the Tocks Island dam would use the National Environmental Policy Act in their fight to stop the damming of the Delaware.¹⁶³ A 3-1 vote against the dam by the Delaware River Basin Commission in 1975 decided the fate of the proposed dam. The 1978 Wild and Scenic designation for the Middle and Upper Delaware River made any dam proposal moot and the authorization for the Tocks Island dam was ultimately defunded.

The commitment to building new dams was affected by the debates around Tellico, Tocks Island and other dams proposed in the 1970's. But the Clean Water Act dates to a time when dam construction was still supported which means federal antidegradation regulations today continue to allow states to remove a designated use (when that use is not an existing use) if the presence of a dam, and the associated water quality impacts, prevents the attainment of the designated use. Before removing the designated use, it must be shown that it is not feasible to restore the waterbody to its original condition.

The body of knowledge about the harmful effects of dams on streams has only continued to grow since the Clean Water Act was passed. With what we know today, the continuing presence of a dam should not be accepted as justification for removing a designated use and for accepting reduced water quality. In recent years, dam removal has been shown to be a highly effective restoration tool,¹⁶⁴ reversing long-standing degraded stream conditions that had resulted from the presence of the dam.

With over 3,000 dams across Pennsylvania streams,¹⁶⁵ the potential benefits for dam removal and the associated improvement in water quality are significant. Conversely, using the presence of a dam as justification for removal of a designated use will mean that some streams will not benefit from dam removal; rather the status quo—altered stream channels, changed water chemistry and sediment transport, altered flow and temperature regimes, modified aquatic communities, and disrupted

¹⁶² Billington, David P., et al. 2005. The History of Large Federal Dams: Planning, Design, and Construction in the Era of Big Dams. US Department of Interior. Retrieved from http://www.cr.nps.gov/history/online_books/dams/federal_dams.pdf

¹⁶³ Albert, Richard C. 2005. Damming the Delaware. The Pennsylvania State University.

¹⁶⁴ American Rivers. 2002. The Ecology of Dam Removal: A Summary of Benefits. Retrieved from <http://www.michigandnr.com/PUBLICATIONS/PDFs/fishing/dams/EcologyofDamRemoval.pdf>.

¹⁶⁵ American Society of Civil Engineers. 2010. Dams and Levees: 2010 Report Card for Pennsylvania's Infrastructure. Retrieved from <http://www.pareportcard.org/PDFs/DamsLevees%20FINAL%20w%20NAT.pdf>.

fisheries—will be accepted. When a dam is present on a stream that is not meeting a designated use, removal of the dam, not removal of the designated use, should be considered.

The negative effects of dams on waterways have been used by dischargers for their own purposes. Recently, a number of petitions have come before the EQB to “correct” the designation of impounded bodies of water as wrongly designated. The York Water Company successfully petitioned the EQB to redesignate a portion of the East Branch Codorus Creek basin from Cold Water Fishery to Warm Water Fishery. DEP determined that dams, diversions or other types of hydrologic modifications precluded attainment of the Cold Water Fishery use.¹⁶⁶ Other designation “corrections” initiated by DEP include:

- * Blue Marsh Lake, designation changed from Trout Stocking Fishery to Warm Water Fishery¹⁶⁷
- * Clarion River, designation changed from Cold Water Fishery to Warm Water Fishery¹⁶⁸
- * Lake Luxembourg, designation changed from Cold Water Fishery/Migratory Fishery to Trout Stocking Fishery/Migratory Fishery¹⁶⁹
- * Walker Lake, designation changed from Trout Stocking Fishery to Warm Water Fishery¹⁷⁰

Although none of these changes in designations has to date affected HQ or EV waters, DEP has initiated a redesignation of Canoe Creek Lake, currently designated an HQ water. If dams, diversions or other types of hydrologic modifications are considered as factors precluding Canoe Creek Lake or other impounded segments of HQ or EV waters from attaining their use designation, removal of the hydrologic modification should be considered to restore the use designation. Impounded segments of HQ or EV waters are not in need of corrected designations, but are instead impaired segments of these waters requiring restoration.

Currently, those proposing new dams on Pennsylvania waters are required to obtain a permit regardless of the waterways designated use¹⁷¹ unless the proposed dam is considered non-jurisdictional¹⁷² or falls into the eight categories for which DEP has waived permits.¹⁷³ Among the dams for which permits are

¹⁶⁶ PA DEP. 2002. East Branch Codorus Creek Online Report. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/Browns%20Run/East_Branch_Codorus_Creek.pdf.

¹⁶⁷ PA DEP. 2005. Blue Marsh Lake Water Quality Standards Review – UAA-Lake Redesignation Evaluation. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/Lakes/Blue_Marsh.pdf.

¹⁶⁸ PA DEP. 2006. Water Quality Standards Review, Stream Redesignation Evaluation - Clarion River. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/Big%20Brook/Clarion%20River.pdf.

¹⁶⁹ PA DEP. 2005. Lake Luxembourg Water Quality Standards Review – UAA-Lake Redesignation Evaluation. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/Lakes/Lake_Luxembourg.pdf.

¹⁷⁰ PA DEP. 2005. Walker Lake, Snyder County. Water Quality Standards Review – UAA-Lake Redesignation Evaluation. Retrieved from http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Stream_Packages/Lakes/Walker_Lake.pdf.

¹⁷¹ Pennsylvania Campaign for Clean Water. 2007. The Effects of Special Protection Designation. Retrieved from <http://www.cbf.org/Document.Doc?id=255>.

¹⁷² The proposed dam does not meet the minimum criteria put forth for under Section 105.3. Scope. In Pennsylvania non-jurisdictional dams will have contributory drainage area 100 acres or less, impound 15 feet or less of water at the greatest depth, and maximum storage elevation of 50 acre-feet or less.

¹⁷³ § 105.12. Waiver of permit requirements.

waived are structures not exceeding three feet in height in a stream not exceeding 50 feet in width, unless the waterbody is a wild trout stream. DRN's research¹⁷⁴ has shown that even small dams are damaging to stream health making dam construction contrary to Pennsylvania's antidegradation policy to maintain and protect water quality on HQ or EV streams. DRN recommends prohibiting construction of dams on EV waters and requiring that DEP undertake an environmental assessment for any dam proposed for HQ waters. Dam construction on HQ waters should only be allowed if there is no feasible alternative and it can be shown that the dam will not degrade water way health or quality.

Pennsylvania continues to permit dams on EV waters; however DEP is required to first undertake an environmental assessment.¹⁷⁵ A completed environmental assessment includes: a location map; determination of historic/archaeological sites; completed and approved Pennsylvania Natural Diversity Index search; site plan with cross sections; project description narrative; color photographs with map showing location taken; environmental assessment forms; mitigation plan; and an alternatives analysis. The only additional requirements for a non-jurisdictional dam located on an EV water are: the mean depth and maximum depth of the stream at the location of the dam; description of the release structure; the rate of a conservation release; the design of bypass structures; the use of the dam, and the material used for dam construction. Dams less than 3 feet in height on non-wild trout streams less than 50 feet in width and certain dams subject to the Mine Safety and Health Administration regulation can be constructed on an HQ water without any permit or even an environmental assessment.

Recommendations

Federal Level

- Remove dams, diversions or other types of hydrologic modifications from among the justifications for removing a designated use from a waterbody.

State Level

- Prohibit damming of EV streams by using 401 certification to veto proposed dam construction on these streams.¹⁷⁶
- Require that DEP undertake an environmental assessment for any dam proposed for HQ waters and only allow construction if there is no feasible alternative and it can be shown that the dam will not degrade water way health or quality.
- Prevent use designation downgrades for impounded waters; impounded segments of HQ or EV waters should be considered impaired due to thermal modifications with dam removal proposed as a restoration option.

¹⁷⁴ In 2003, DRN staff undertook a study of two Ridley Creek headwater streams to observe the impact that dams may have on water temperature. One tributary is free-flowing with no dams present; the other's flow is impounded by four manmade dams. Both headwater streams are about the same length and drain similar land use types with forested, residential, and agricultural influences. Over a four-day period during August and September, a total of 21 readings were taken. The free flowing tributary had an average temperature of 61.1°F; the impounded tributary averaged 70.4°F, nearly ten degrees higher. Free-flowing stream temperatures ranged from 58.8°F to 63.7°F while the impounded tributary's temperatures ranged from 67.5°F to 74.3°F. The free-flowing stream exhibited the optimal temperatures for trout and other coldwater fish that you expect to find in a forested headwater stream. On the tributary influenced by impoundments, all but three readings exceeded 68.0°F, unnaturally warm temperatures for a spring-fed headwater stream.

¹⁷⁵ PA DEP. 2002. Instructions for Completing a Request for Section 105.15 Environmental Assessment Approval. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-54648/3140-PM-WE0002.pdf>.

¹⁷⁶ A 401 certification is a verification issued by the DEP that a specific project will not violate water quality standards. Dam construction on an EV stream would degrade water quality and would therefore be in violation of state water quality standards.

❖ Drinking Water Supply Protection

Three out of every four Pennsylvanians get their drinking water from rivers or streams.¹⁷⁷ Not surprisingly, all waters in Pennsylvania are designated for use as Potable Water Supply,¹⁷⁸ but this designation does not protect these drinking water sources from discharges of pollution. The Pennsylvania Code defines Potable water supply as “[a] water source that is used by humans after conventional treatment for drinking, culinary and other purposes such as inclusion in food products.”¹⁷⁹ In other words, drinking water is water that—after conventional treatment is employed—can be suitable for use as a drinking water supply. More specifically, that “the water quality criteria for total dissolved solids, nitrite-nitrate nitrogen, phenolics, chloride, sulfate and fluoride established for the protection of potable water supply shall be met at least 99% of the time”.¹⁸⁰

The goal of the federal Safe Drinking Water Act is to protect public health by regulating the nation’s public drinking water supply.¹⁸¹ Under the Safe Drinking Water Act, water providers are required to deliver safe drinking water to their customers, however the inadequacy of conventional drinking water treatment has received high profile attention. A *New York Times* analysis that looked at federal drinking water data from 2004 to 2009 revealed that water provided to more than 49 million people contained illegal concentrations of chemicals like arsenic or radioactive substances like uranium as well as dangerous bacteria often found in sewage.¹⁸² Pennsylvania requires that waters suitable for a drinking water supply meet criteria for a specified list of pollutants 99% of the time,¹⁸³ but as the *New York Times* series has illustrated, only 91 contaminants are regulated by the Safe Drinking Water Act, yet more than 60,000 chemicals are used within the U.S.¹⁸⁴ Little is known about potential interaction among these many chemicals in drinking water supplies or how these chemicals are affected by environmental factors such as sunlight.

Despite growing concern over the health impacts of chemicals such as endocrine disruptors, no chemicals have been added to the list of contaminants to be monitored under the Safe Drinking Water Act since 2000.¹⁸⁵ Moreover maximum allowed levels of monitored contaminants have remained largely unchanged for decades. As water treatment costs can be significant, water providers are reluctant to look at adding hundreds or thousands of chemicals to the list of contaminants to be monitored, arguing that for many of the chemicals the risk of exposure is low or the affect of the chemicals has not been determined.

¹⁷⁷ Groundwater Protection Council. 1999. State Fact Sheets: Pennsylvania Ground Water Conditions. Retrieved from http://www.gwpc.org/e-library/documents/state_fact_sheets/pennsylvania.pdf.

¹⁷⁸ §93.3. Water Quality Standards, Protected Water Uses.

¹⁷⁹ §96.1. Water Quality Standards Implementation, Definitions.

¹⁸⁰ §96.3. Water Quality Standards Implementation, Water Quality Protection Requirement.

¹⁸¹ The Clean Water Act protects the health of our water resources by the by regulating the pollutants discharged to them.

¹⁸² Duhigg, Charles. 7 December 2009. Millions in U.S. Drink Dirty Water, Records Show, Toxic Waters: A series about the worsening pollution in American waters and regulators’ response, New York Times. Retrieved from http://www.nytimes.com/2009/12/08/business/energy-environment/08water.html?_r=3&pagewanted=1.

¹⁸³ §96.3 Water Quality Standards Implementation, Water Quality Protection Requirement

¹⁸⁴ Duhigg, Charles. 17 December 2009. That Tap Water Is Legal but May Be Unhealthy, Toxic Waters: A series about the worsening pollution in American waters and regulators’ response, New York Times. Retrieved from <http://www.nytimes.com/2009/12/17/us/17water.html?scp=3&sq=drinking%20water&st=cse>.

¹⁸⁵ Duhigg, Charles. 17 December 2009. That Tap Water Is Legal but May Be Unhealthy, Toxic Waters: A series about the worsening pollution in American waters and regulators’ response, New York Times. Retrieved from <http://www.nytimes.com/2009/12/17/us/17water.html?scp=3&sq=drinking%20water&st=cse>.

In recent years, many of Pennsylvania's public water authorities have transitioned into the control of private companies and they are less constrained by the political concerns that can keep public authorities from passing increased treatment costs onto their customers.¹⁸⁶ The Pennsylvania Public Utility Commission (PUC) has jurisdiction over private water companies and their rates.¹⁸⁷ The PUC sets private water company rates based on the true cost of providing water service. Therefore, should a private company experience increased costs due to increased treatment associated with degrading water quality, those costs will be passed on to customers. And where public authorities are generally required to operate on a no-profit basis, private water companies are motivated to return a profit. Profit-driven private water companies have no motivation to encourage water conservation and they may look to reduce costs by performing only the minimum level of monitoring required.¹⁸⁸

For a private water company, motivation to take an active role in protecting the quality of its drinking water supply is limited because the company can pass along any increased treatment costs to its customers. For example, in 2006 when DRN began an effort to upgrade the use designation of the Upper Perkiomen, a private water company, Aqua Pennsylvania,¹⁸⁹ was invited to sign on as a competitor. The Upper Perkiomen watershed comprises the drainage area that feeds the Green Lane Reservoir in Montgomery County which serves as a drinking water supply for the water company. Aqua Pennsylvania declined to sign on. Coincidentally, Springton Reservoir in Delaware County is fed by the Crum Creek and was at the time Aqua Pennsylvania's second largest reservoir.¹⁹⁰ This is the same drainage area where data from DRN monitoring has indicated a decline in the water quality of the special protection sections of that stream.

The EPA has estimated a significant investment, nearly \$335 billion, is needed if drinking water utilities are to continue providing safe drinking water to the public.¹⁹¹ Pennsylvania American Water Company recently submitted a request to the Pennsylvania Public Utility Commission to raise drinking water rates by 13% for all customers across the state to offset \$533 million spent on water facility improvements made across the state since 2009.¹⁹²

Where water treatment costs can be significant and ongoing, protection of water supplies can provide savings, as illustrated by the preservation of Sterling Forest in New Jersey. The owners of the 16,000-acre Sterling Forest in New Jersey proposed constructing 13,000 homes, 8 million square feet of commercial and light industrial development, and 3 golf courses. New Jersey officials calculated that this development would so pollute the local watershed and water supply that a new filtration plant would be required at an estimated cost of \$160 million. Instead, New Jersey officials put up \$10 million

¹⁸⁶ Hauter, Wenonah. 27 May 27 2008. The Perils of Privatization: The conflict between multinational corporations' quest for profits and the simple human right to clean, safe water. The American Prospect. Retrieved from http://www.prospect.org/cs/articles?article=the_perils_of_privatization.

¹⁸⁷ For more about the Pennsylvania Public Utility Commission, go to <http://www.puc.state.pa.us/>.

¹⁸⁸ Water Science and Technology Board. 2002. Privatization of Water Services in the United States: An Assessment of Issues and Experience. Retrieved from http://books.nap.edu/openbook.php?record_id=10135&page=87.

¹⁸⁹ The company that has become Aqua Pennsylvania (and part of Aqua America) came into existence as a small utility providing drinking water to residents of Springfield Township, Delaware County. Today, Aqua America serves 3 million people in 13 states.

¹⁹⁰ Aqua America. 2011. Our History. Retrieved from <https://www.aquaamerica.com/Pages/History.aspx>

¹⁹¹ US EPA. 2009. Drinking Water Infrastructure Needs Survey and Assessment. Retrieved from http://www.epa.gov/ogwdw000/needssurvey/pdfs/2007/report_needssurvey_2007.pdf.

¹⁹² Metz, Gretchen. 1 June 2011. PA American Customers Face Another Hike, Daily Local News. Retrieved from <http://www.dailylocal.com/articles/2011/06/01/news/doc4de6de919ce97030850984.txt?viewmode=fullstory>.

toward the purchase of the land and worked with the Trust for Public Land and the Open Space Institute which negotiated with the owners and helped raise \$55 million to preserve more than 90% of Sterling Forest, eliminating the investment that would have been needed not only for construction of a filtration plant, but also for annual operating costs.¹⁹³

Another example of protection and preservation of upstream forested and rural habitats is illustrated by New York City's water supply. In January 1997, in order to safeguard its irreplaceable natural water supply, an innovative watershed protection plan was developed and is embodied in the landmark New York City Watershed Memorandum of Agreement (MOA). Nine million people in New York and its suburbs rely on the Delaware River and Catskill region for their water. The watershed of the City's water supply is a 1,900 square mile area. New York City owns about ten percent of the watershed and has worked with upstate communities to acquire and protect land in the watershed, to minimize development, and prevent contamination by runoff. New York City determined that preservation and using the forest's natural ecosystem services to filter out pollutants was more economical than developing a filtration plant. Estimated costs for the construction of a filtration plant ranged from eight to ten billion dollars with an estimated one million dollar cost for daily operation and maintenance of the filtration plant.¹⁹⁴ This protected watershed is a prime target area for natural gas drilling companies interested in tapping the Marcellus Shale. New York leaders and community groups have been calling for a moratorium on drilling in areas such as this that serve as water supply.

Pennsylvania continues to allow the discharge of wastewater produced during the natural gas extraction process, called hydraulic fracturing, or fracking, to be discharged to streams.¹⁹⁵ A recent study by the University of Pittsburgh has validated concerns about inadequate treatment of the drilling wastewater. Even after "treatment," wastewater discharges contain many harmful constituents.¹⁹⁶ For example, an analysis of discharge wastewater conducted at the Pennsylvania Brine Treatment, Inc., Josephine Facility by the University of Pittsburgh shows high levels for contaminants including: barium levels 14 times the maximum contaminant level (MCL) set by the EPA for drinking water (2 parts per million). Barium levels exceeded the MCL by 1.3 times for aquatic life protection and exceeded the EPA's standard for continuous concentration (CCC) to protect aquatic health by 6.7 times. Levels of bromide were detected at 10,688 times the 100 ppb level that raises concern in freshwater sources. Bromides in freshwater, when mixed with disinfection treatment processes for drinking water, form trihalomethanes and other chloro-bromo byproducts that are hazardous to human health. Chloride levels at the Josephine discharge were 138 times the EPA criteria maximum concentration (CMC) and 511 times the CCC to protect aquatic life. Gross exceedences found for other constituents included (but were not limited to): strontium, benzene, manganese, 2 butoxyethanol, and TDS. Because of these wastewater issues, DRN is calling for a zero discharge policy for wastewater from fracking.

¹⁹³ The Trust for Public Land. 2006. Sterling Forest Capstone Protected (NY). Retrieved from http://www.tpl.org/tier3_cd.cfm?content_item_id=21043&folder_id=630.

¹⁹⁴ New York Department of Environmental Conservation. n.d. New York City Watershed Program. Retrieved from <http://www.dec.ny.gov/lands/25599.html>.

¹⁹⁵ Caruso, David B., 1 March 2011. 'Fracking' Wastewater Still a Problem in Pennsylvania. MSNBC. Retrieved from http://www.msnbc.msn.com/id/41858136/ns/us_news-environment/t/fracking-wastewater-still-problem-pennsylvania/.

¹⁹⁶ Volz, Conrad D., 12 April 2011. Written Testimony before the Senate Committee on Environment and Public Works and its Subcommittee on Water and Wildlife, Joint Hearing on Natural Gas Drilling, Public Health and Environmental Impacts. Retrieved from <http://www.chec.pitt.edu/documents/Testimonies/Volz2011senatetestimony.pdf>.

Through its Source Water Assessment and Protection Program, DEP has supported the development of local source water protection programs, but these voluntary assessment and education efforts do nothing to protect source waters from the cumulative impacts of additional permitted discharges. Pennsylvania does have a tool to protect its drinking water supplies: its antidegradation policy. Use as a drinking water supply could be made one of the criteria for designation as an EV stream (a petition to the EQB would be required to change the regulation).

If a surface water provides drinking water for more than 100,000 people, this should constitute an outstanding local resource water. Protecting drinking water under antidegradation policies is being done in other states here in the Delaware River watershed and across the country. New Jersey designates any water supply system serving a population of greater than 100,000, including reservoirs and natural tributaries, as an Exceptional Water Supply (also referred to as Category One or C1 waters).¹⁹⁷ New York protects its drinking water sources as Class AA-S waters and restricts discharges to and limits flow alterations of these waters.¹⁹⁸

Recommendations

Federal Level

- Challenge the EPA to study more of the 60,000 chemicals that are used within the U.S., potential interaction among these many chemicals in drinking water supplies, and how these chemicals are affected by environmental factors to expand the number of chemicals regulated by the Safe Drinking Water Act.
- Require disclosure of the chemical constituents of hydraulic fracturing fluids to public agencies.¹⁹⁹
- Restore regulation of hydraulic fracturing for gas and oil under the Safe Drinking Water Act.²⁰⁰

State Level

- Update the Pennsylvania Code to provide stronger protection for surface lands and water supplies from gas drilling.
- Designate as EV waters all surface waters that serve as a water supply for 100,000 people or more.

Community Level

- Petition the EQB to include among the criteria for protection as EV waters those surface waters serving 100,000 people or more.

Individual Level

- Meet with local legislators to discuss the importance of forested watersheds for protecting clean drinking water.

¹⁹⁷ Mallepalle, Gigi. 2010. Category One Waters. Retrieved from www.state.nj.us/dep/wms//SWQS_antideg.pdf.

¹⁹⁸ New York Department of Environmental Conservation. §701.3 Class AA-Special (AA-S) fresh surface waters. Retrieved from <http://www.dec.ny.gov/regs/4592.html#15992>.

¹⁹⁹ The FRAC Act (S 587 and HR 1084) would amend the Safe Drinking Water Act to repeal the 2005 exemption for hydraulic fracturing and for other purposes. For more information go to <http://www.govtrack.us/congress/bill.xpd?bill=s112-587> or <http://www.govtrack.us/congress/bill.xpd?bill=h112-1084>.

²⁰⁰ The FRAC Act (S 587 and HR 1084) would amend the Safe Drinking Water Act to repeal the 2005 exemption for hydraulic fracturing and for other purposes. For more information go to <http://www.govtrack.us/congress/bill.xpd?bill=s112-587> or <http://www.govtrack.us/congress/bill.xpd?bill=h112-1084>.

❖ **Threatened and Endangered Species Protection**

Pennsylvania's antidegradation policy recognizes the need to protect surface waters where threatened and endangered (T&E) species are physically present;²⁰¹ the need to protect certain physical, chemical, or biological features in surface waters that are essential to the conservation of T&E species; and the need to protect specific surface waters that support one or more life stages of T&E species. But DEP's procedures for the implementation of this water quality policy are confusing. DEP's own antidegradation guidance omits the agency from the list of state and federal resource agencies with the responsibility for T&E species despite the requirements of §93.4c(a)(2):

Endangered or Threatened Species. If the Department has confirmed the presence, critical habitat, or critical dependence of endangered or threatened Federal or Pennsylvania species in or on a surface water, the Department will ensure protection of the species and critical habitat.

DEP can do more to protect T&E species through its power to issue or deny permits or approvals when projects are proposed that have the potential to impact surface waters where T&E species are physically present; the physical, chemical, or biological features of those surface waters; or surface waters that support the life stages of T&E species.

For the decade from 1990 to 2000, Pennsylvania ranked 5th in the nation for the amount of open space lost to development.²⁰² The pace of open space loss continued to accelerate and by 2005 Pennsylvania was losing 350 acres of open space to development every day.²⁰³ The pace of loss for Pennsylvania's wetlands, which provide critical habitat for many threatened and endangered species, has been even more dramatic. It is estimated that Pennsylvania has lost nearly half of its wetlands.²⁰⁴ A 1993 and 1994 EPA stream survey, conducted throughout the Mid-Atlantic Highlands to develop an index of biotic integrity, showed that 27% of Pennsylvania's streams were in poor condition based on aquatic insect and fish populations.²⁰⁵ Aquatic resources throughout the U.S. are in decline, and destruction of habitat is the leading cause. Habitat alteration has been cited as a contributing factor in as much as 75% of all fish extinctions during the past 75 years²⁰⁶ and 91% of fish listings under the ESA.²⁰⁷

²⁰¹ PA DEP. 2003. Water Quality Antidegradation Implementation Guidance. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-47704/391-0300-002.pdf>.

²⁰² Ketchum, Ann. 2006. Conserving Special Places DCNR's Plan for Guiding Future Investments in Land Acquisition. Pennsylvania Department of Conservation and Natural Resources. Retrieved from www.dcnr.state.pa.us/info/conservingspecialplaces.doc.

²⁰³ McMahaon Edward T. and Shelley S. Mastran. 2005. Better Models for Development. The Conservation Fund and the Pennsylvania Department of Conservation and Natural Resources. Retrieved from <http://www.dcnr.state.pa.us/brc/grants/2005/BetterModels.pdf>.

²⁰⁴ Pennsylvania Game Commission and the Pennsylvania Fish and Boat Commission. 2005. Pennsylvania's Comprehensive Wildlife Conservation Strategy, Version 1.0. Retrieved from http://www.wildlifeactionplans.org/pdfs/action_plans/pa_action_plan.pdf.

²⁰⁵ US EPA. 2000. Mid-Atlantic Highlands Stream Assessment. Retrieved from <http://www.epa.gov/wed/pages/publications/authored/EPA903R-00015MAHAStreamsStoddard.pdf>.

²⁰⁶ Miller, Robert R. et al. 1989. Extinctions of North American Fishes During the Past Century. Fisheries, 14 (6) 22-38. Retrieved from <http://water.nv.gov/hearings/past/spring/exhibits/USFWS/FWS-2068.pdf>.

²⁰⁷ Pennsylvania Game Commission and the Pennsylvania Fish and Boat Commission. 2005. Pennsylvania's Comprehensive Wildlife Conservation Strategy, Version 1.0. Retrieved from http://www.wildlifeactionplans.org/pdfs/action_plans/pa_action_plan.pdf.

Pennsylvania's antidegradation program, through the special protections available for surface waters designated EV, provides a potential mechanism for providing better protection for T&E species. DEP currently implements protection of T&E species on a permit-by-permit basis upon confirmation of the presence, physical habitat, or critical dependence of a T&E species. Establishing the presence of T&E species as an automatic qualifier for EV status for a surface water would provide more comprehensive protection.

The regulations may already provide for this approach. DEP simply needs to apply it: "The Department may consider additional biological information which characterizes or indicates the quality of a water in making its determination,"²⁰⁸ which in many ways is analogous to the qualifier for a Class A Wild Trout Stream.²⁰⁹ Precedent for adoption of this approach also can be found in other states: Iowa includes the presence of T&E species among its criteria for consideration as Tier 3, which is equivalent to Pennsylvania's EV designation, or Tier 2.5, which is a designation more protective than Pennsylvania's HQ designation but less protective than Pennsylvania's EV designation.²¹⁰ Arizona also provides special protection designation if threatened or endangered species are known to be associated with the surface water and the existing water quality is essential to the maintenance and propagation of a T&E species. Arkansas specifically lists T&E species and can designate waters with these species as outstanding, or Tier 3, waters. Rhode Island includes waterbodies containing critical habitats for rare or endangered species as qualifying for their "Special Resource Protection Waters".²¹¹

Recommendations

State Level

- Require that New or Expanded Facility Permits, Renewal of Major Permits and EPA Non-waived Permit Applications be subject to Pennsylvania Natural Diversity Inventory screening and, where conflict is revealed, require coordination/consultation with appropriate State and/or federal agencies.
- Prohibit the use of general permits or waivers in waters that support federally- or State-listed threatened or endangered species.

Community Level

- Petition the EQB to include the presence of T&E species among the criteria for protection as EV waters

²⁰⁸ §93.4b(a)(2)(i)(c). Biological assessment qualifier.

²⁰⁹ §93.4b(a)(2)(ii). Class A wild trout stream qualifier.

²¹⁰ Iowa Department of Natural Resources. 2010. Iowa Antidegradation Implementation Procedure. Retrieved from http://www.iowadnr.gov/water/standards/files/antideg_2_17.pdf.

²¹¹ River Network. 2009. Antidegradation Report Query. Retrieved from <http://www.rivernetwork.org/rn/antidegradation>.

❖ Non-degrading Discharges and Degrading Discharges

Under federal antidegradation policy,²¹² no degradation of water quality is allowed in Tier 3 waters. Degradation may be allowed in Tier 2 water for important social or economic justification. EPA guidance allows state to permit *de minimis* or insignificant discharges that may lower water quality somewhat, but not significantly in Tier 2 waters.²¹³

Pennsylvania's antidegradation policy²¹⁴ calls for protecting and maintaining the water quality of EV waters. However, DEP's non-degradation test may be allowing degradation to occur in EV waters. DEP's test utilizes a default set of baseline water goals for all HQ and EV waters statewide. These values represent average values that are based on a statewide dataset. Although the source dataset is described as having low variability, some streams in the dataset will have less assimilative capacity than that represented by these default average values. By allowing these so called non-degrading discharges, DEP may actually be allowing some lowering of water quality in EV streams which is not permitted under federal or Pennsylvania antidegradation policy. If proposed discharges to EV of HQ waters are being considered under the non-degradation test, applicants should be required to pay for monitoring to determine the actual assimilative capacity of the proposed receiving stream.

DEP appears to have determined all discharges associated with earth disturbance activities related to oil and gas exploration and extraction as non-degrading without the required factoring of cumulative impacts. In the 2001 settlement of *Valley Creek Coalition v. DEP and Vanguard Group*,²¹⁵ DEP agreed that an applicant must address the permanent and cumulative effects of stormwater, including both the rate and volume of discharges. When challenged to address the permanent and cumulative effects of stormwater from post-construction discharges for all development in all EV watersheds across Pennsylvania, DEP responded that a cumulative impact analysis was embedded in the antidegradation analysis.²¹⁶ However, comments by Citizens for Pennsylvania's Future on behalf of its client Upper Providence for Open Space, Inc., revealed that the required cumulative impact analysis was not undertaken for an NPDES permit application (NPDES No. PAI012303003, The Riddle Estate, Upper Providence and Middletown Townships, Delaware County).²¹⁷

DRN did not review a cumulative impact analysis as none were found in any of the files reviewed for this report. DRN anticipated that a cumulative impact analysis might have been found among concurrent applications for three Small Flow Treatment Facilities, all submitted by the same applicant, which would all discharge to the same stream, but none was included. All three applications noted that, “[a]s the lots are rather large and the surrounding area is rural in nature, these three existing parcels will

²¹² 40 CFR 131.12. Antidegradation Policy.

²¹³ King, Ephraim S. 2005. Memorandum: Tier 2 Antidegradation Reviews and Significance Thresholds. U.S. Environmental Protection Agency. Retrieved from http://www.deq.idaho.gov/rules/water/58_0102_1001_ephraim_king_memo.pdf.

²¹⁴ §93.4a. Antidegradation.

²¹⁵ PA DEP. 2002. Comprehensive Stormwater Management Policy: Comment/Response Document. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Version-48418/392-0300-002%20CR.pdf>.

²¹⁶ PA DEP. 2002. Comprehensive Stormwater Management Policy: Comment/Response Document. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Version-48418/392-0300-002%20CR.pdf>.

²¹⁷ Citizens for Pennsylvania's Future. 15 January 2004. Comments on Riddle Estate. Retrieved from <http://www.pennfuture.org/content.aspx?SectionID=125&MenuID=>.

not impart any great additional load on local resources.”²¹⁸ This statement broaches the issue of cumulative impacts, but falls far short of the mark as an analysis.

DEP’s position is that correction of a public health problem satisfies the SEJ requirements for important economic or social justification and permits SFTFs to HQ and EV stream to correct failing on-lot septic systems. These three discharges did not represent failing systems. All three applications were submitted for new discharges that would serve homes yet to be built. As of June 2011, none of these homes had been constructed. Each lot was still available for sale as a buildable lot.^{219,220,221} The important social and economic justification for approving these permits appears not to have been to correct a public health hazard, but to improve the suitability of these lots for residential development. These three SFTFs, taken with *Valley Creek Coalition v. DEP and Vanguard Group* and Citizens for Pennsylvania’s Future review of the Riddle Estate NPDES permit application, suggest that DEP is not following its own guidance to consider cumulative impact to HQ and EV waters on a site-specific, case-by-case basis during permitting.²²²

DEP can choose to permit a discharge for either an HQ or EV water as long as a proposed discharge is considered to be non-degrading, but recent legal challenges like *Blue Mountain Preservation Association v. DEP and Alpine Resorts*²²³ and *Crum Creek Neighbors v. Commonwealth, DEP and Pulte Homes*²²⁴ suggest that the test that DEP is required to undertake to determine that discharges are non-degrading are not being performed routinely. Permitting of a non-degrading discharge that is in fact a degrading discharge, as was initially done in *Crum Creek Neighbors v. Commonwealth, DEP and Pulte Homes*, will lower water quality. Calling a degrading discharge non-degrading does not make it so.²²⁵

The lapses seen in DEP analyses of nondischarge alternatives in *Blue Mountain Preservation Association v. DEP and Alpine Resorts* and *Crum Creek Neighbors v. Commonwealth, DEP and Pulte Homes* are contrary to federal antidegradation policy; they undermine the special protections that HQ and EV streams are supposed to be afforded under Pennsylvania’s antidegradation program. The door is opened for potential degradation which is not allowed for any EV water.

²¹⁸ Shepherd 171 SRSTP, NPDES Permit No. Pa 0244490, DEP file correspondence, Shepherd 177 SRSTP, NPDES Permit No. Pa 0244511, DEP file correspondence, and Shepherd 191 SRSTP, NPDES Permit No. Pa 0244503, DEP file correspondence.

²¹⁹ Trulia.com. 9 June 2011. 171 Creamery Road, Coatesville PA 19320. Retrieved from <http://www.trulia.com/property/1090785578-171-Creamery-Rd-Coatesville-PA-19320>.

²²⁰ Trulia.com 9 June 2011. 177 Creamery Road, Coatesville PA 19320. Retrieved from http://www.trulia.com/for_sale/39.96297,40.07255,-75.91291,-75.82899_xy/40.017761,-75.870949,177_Creamery_Rd,Coatesville,PA,19320_addr/fs,s,fr_pt/.

²²¹ Trulia.com. 9 June 2011. 191 Creamery Road, Coatesville PA 19320. Retrieved from <http://www.trulia.com/property/1090785580-191-Creamery-Rd-Coatesville-PA-19320>.

²²² PA DEP. 2003. Water Quality Antidegradation Implementation Guidance. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-47704/391-0300-002.pdf>.

²²³ *Blue Mountain Preservation Association v. DEP and Alpine Resorts*, EHB 2005-077-K. 2006. Retrieved from <http://blogs.law.widener.edu/envirolawcenter/files/2009/09/BMPA-EHB-9-7-06-Opinion.pdf>.

²²⁴ *Crum Creek Neighbors v. Commonwealth, DEP and Pulte Homes*, EHB Docket No. 2007-287-L. 2009. Retrieved from <http://ehb.courtapps.com/efile/documentViewer.php?documentID=4561>.

²²⁵ *Crum Creek Neighbors v. Commonwealth, DEP and Pulte Homes*, EHB Docket No. 2007-287-L. 2009. Retrieved from <http://ehb.courtapps.com/efile/documentViewer.php?documentID=4561>.

While DRN did not review nondischarge alternative analyses for this study, a review by River Network found that, in many states, the alternatives analysis procedure is not undertaken early enough in the planning process. If the alternatives analysis is not undertaken until an NPDES permit application is submitted, it is unlikely that many alternatives will receive real consideration.²²⁶ DEP should require that nondischarge alternatives analyses are conducted by permit applicants during the pre-design phase of planning. Public scrutiny of proposed nondischarge alternatives and non-degrading discharges to HQ or EV waters remains necessary to ensure that the required analyses are undertaken and undertaken. Interested individuals should make an effort to stay informed regarding discharges proposed for local HQ or EV waters.

DEP may ultimately allow a reduction in water quality in an HQ waterway if it is considered necessary for important social or economic development (e.g., correcting existing public health or pollution hazards). DRN believes the process of determining whether a lowering of water quality is necessitated by a social or economic justification, or SEJ review, relies on modeling and subjective factors. Because of the subjective nature of the SEJ evaluation process, DEP should develop standards to guide agency staff in evaluating whether the social and economic benefits of the proposed degrading discharge outweigh the environmental impacts of lower water quality. The information submitted in the SEJ reviews examined by DRN varied considerably. Little documentation of the social and economic benefits asserted to result from the proposed degrading discharges was provided on the documents DRN examined. The expansion of a sewage treatment plant should require better justification than “future growth.”²²⁷ The opening of a quarry should require better justification than “to provide quarry stone.”²²⁸ The simultaneous permitting of three SFTF discharges to an HQ stream should require a cumulative impact analysis and better justification than improving salability (and the financial return to the owner) of three vacant lots.²²⁹

The burden of proof to provide documentation of social and economic benefits is on the project/activity sponsor, but DEP should have minimum standards for this documentation in order to ensure that the assertions of social and economic benefits are indeed well-founded. Additionally, to ensure consistency statewide, all SEJ reviews should utilize the statewide SEJ review team as specified in the Pennsylvania’s *Water Quality Antidegradation Implementation Guidance*.

Contrary to Pennsylvania’s *Water Quality Antidegradation Implementation Guidance*, SEJ reviews involve only a small number of DEP staff, as few as two even before the current budget cuts and staffing reductions. This limits awareness and understanding of the SEJ review process within the agency and raises questions regarding consistency over time, particularly when the agency experiences staff turnover, two concerns that highlight the importance of maintaining a centralized SEJ file that is accessible online to staff in regional offices. DEP’s centralized SEJ file should provide examples of

²²⁶ Frey, Merritt and Brad Klein, May 2009. Conducting a Meaningful, Efficient Antidegradation Alternatives Analysis: A Road Map. Paper Presented at River Rally, Baltimore, MD. Retrieved from http://projects.ch2m.com/cwqf/Workgroups/Content/Standards/docs/Antideg_Alts_Analysis_Roadmap.pdf

²²⁷ Milford-Trumbauersville Area Sewer Authority Wastewater Treatment Plant, NPDES Permit No. PA0042021 DEP file correspondence.

²²⁸ Dingman’s Ferry Stone, Inc. DEP file correspondence, Module 24.

²²⁹ Shepherd 171 SRSTP (NPDES Permit No. PA 0244490), DEP file correspondence, Shepherd 177 SRSTP (NPDES Permit No. PA 0244511), DEP file correspondence, and Shepherd 191 SRSTP (NPDES Permit No. PA 0244503), DEP file correspondence.

review procedures, offer a roadmap for DEP staff to follow, and ensure consistency in the application of SEJ over time and across DEP offices.

No SEJ reviews are undertaken by DEP for stormwater discharges to EV or HQ streams. Special protection stormwater BMPs²³⁰ are utilized to provide protection. On paper, these BMPs may look appropriate and functional, but many on-the-ground problems can result from lack of maintenance or improper installation of these BMPs. In some cases, the selected BMPs may not be adequate, they may be implemented poorly, or the failure of the BMPs may result from a combination factors.²³¹

DRN has seen first-hand an HQ reach of the Upper Perkiomen Creek polluted with vast amounts of sediment in 2006 and 2007.²³² Development of steep slopes and lack of proper erosion and sediment controls caused major sedimentation of an HQ stream. In addition, changes in the local hydrology appeared to result from infiltration after trees and other natural vegetation were destroyed by development. DRN and others complained about the failure of these special protection BMPs and when a public hearing on the impact of the pollution was held, DRN testified along with 15 area residents as to the harm done to the creek. However the resolution of this incident by both DEP and the local conservation district is unclear from a review of the permit file. Development at the site is continuing. Monitoring of special protection BMPs should be required before, during, and after construction for ten to 15 years. Additionally, control sites consisting of HQ and EV waters unimpacted by stormwater should be monitored for comparison.

Federal antidegradation policy requires public participation and intergovernmental coordination in the SEJ review process. The changing nature of communications requires that DEP consider new media as alternate vehicles for making interested persons aware of public comment opportunities. The *Pennsylvania Bulletin* online and DEP's e-Notice service should be considered as notification tools for soliciting public comment during a SEJ review. DEP must act promptly to hold a public hearing when requested by interested parties.

Recommendations

State Level

- Require that applicants for proposed discharges to EV or HQ waters undertake nondischarge alternatives analyses during the pre-design phase of planning.
- Require that applicants for proposed discharges to EV or HQ waters pay for the testing necessary to determine actual assimilative capacity for the receiving streams for the non-degradation test.
- Limit non-degrading discharges to HQ and EV watersheds by requiring cumulative impact analyses when a permit application represents an additional source of a given pollutant.

²³⁰ PA DEP. 2003. Water Quality Antidegradation Guidance Manual. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Version-47704/391-0300-002.pdf>.

²³¹ Delaware Riverkeeper Network. 2010. New Jersey Stormwater Management Implementation : A Case Study of Hamilton Township, Mercer County. Retrieved from http://www.delawareriverkeeper.org/resources/Reports/Hamilton_Twp_NJ_SWM_Implementation_Report.pdf.

²³² Delaware Riverkeeper Network. 2007. Written Testimony for Public Hearing: Re: NPDES Individual Permit Application For Discharge of Stormwater Associated with Construction Activities, Brookshire Partners - PAI023907002, Proposed Discharge of Stormwater to Perkiomen Creek. Retrieved from http://www.delawareriverkeeper.org/resources/PressReleases/Brookshire_Developed_Proposed_Pollution_Discharge_to_Perkiomen_Creek.pdf.

- Require that cumulative impact analyses also consider potential interaction among chemicals in discharges as well as how these chemicals are affected by environmental factors such as sunlight.
- Require post-construction monitoring as part of the permit process of special protection BMPs to provide proof that no harm is occurring.
- Maintain an online centralized SEJ file that provide examples of review procedures and guidance to follow.
- Establish standards for documentation of benefits of social and economic justification.
- Utilize new media for making interested persons aware of public comment opportunities during SEJ reviews.

Community Level

- Review nondischarge alternatives analyses for permits proposed for HQ or EV waters.
- Undertake case studies of permitted non-degrading discharges to determine if these discharges are indeed non-degrading.

Individual Level

- Request a public hearing during the public comment period when a new, additional or increased discharge is proposed for an HQ or EV water.
- Comment on discharges proposed for HQ and EV waters in your community and insist monitoring is conducted by the applicant as part of the permit approval process
- Volunteer to become trained to monitor stormwater BMPs.

❖ Meaningful Public Participation in Decision-Making

Federal antidegradation policy^{233,234} calls for full satisfaction of the public participation process in state antidegradation programs and implementation procedures.²³⁵ Pennsylvania's policy provides for public participation: "Interested persons may provide the Department with additional information during the permit or approval application or review process regarding existing use protection for the surface water."

Among its antidegradation implementation procedures, DEP publishes information about applications for NPDES discharge permits in the *Pennsylvania Bulletin*, the Commonwealth's official gazette for information and rulemaking. Every week, the *Pennsylvania Bulletin* publishes State agency notices including applications before DEP and DEP actions on those applications. The *Pennsylvania Bulletin* is also available online, www.pabulletin.com, and the latest applications and actions can be viewed every Friday at 9:00 am EDT when the current issue is posted on the website.

Our two-year review of the *Pennsylvania Bulletin* for information on applications for discharges to Pennsylvania's HQ or EV surface waters has provided some insight regarding barriers that affect the abilities of interested persons to provide DEP with the additional information called for in Pennsylvania's antidegradation policy. DRN identified what appear to be inaccuracies, inconsistencies, and omissions as well as problems with recordkeeping procedures regarding notices of actions before DEP that were posted in the *Pennsylvania Bulletin* (See Appendix E for detailed descriptions).

Examples include:

- The same permit number assigned to multiple applications.
- A change in the receiving stream between the notice of application and the notice of action.
- Number formatting limiting the functionality of the *Pennsylvania Bulletin's* online search tool.
- Uncorrected inaccuracies in receiving stream names and incomplete stream designation information in a renewal permits.
- Receiving streams with HQ and EV designations that do not appear in Chapter 93, where Pennsylvania's water quality standards are found, or in DEP's online *Existing Use Classification Table*,²³⁶ the mechanism the agency utilizes to list streams with changed uses prior to rulemaking and listing in Chapter 93.
- Inconsistency regarding inclusion of stream designations, primarily in *Coal and Noncoal Mining Activity Applications*.

During the review period, DRN randomly selected eight new or renewal NPDES discharge applications to examine at DEP's regional offices and one of DEP's district mining offices. Although file review procedures differed in each office, the review procedures presented no barriers to undertaking file reviews. However, application processing procedures did result in some confusion and delays in accessing files. DRN staff were told that two of the requests had incorrect permit numbers despite

²³³ 40 CFR 131.12. Antidegradation Policy.

²³⁴ §93.4c (a)(1)(iii). Existing Use Protection.

²³⁵ Through its Water Quality Standards Academy, the EPA has created a module that provides an overview of considerations for involving the public in water quality standards decision-making. It can be viewed online at <http://www.epa.gov/waterscience/standards/academy/special/public/player.html>

²³⁶ PA DEP. 2010. Existing Use Classification Table. Retrieved from <http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Existing%20Use/EU%20table%20list.pdf>.

confirmation that the permit numbers submitted were the permit number that appeared in the *Pennsylvania Bulletin* (PA DEP staff, Personal Communication, 20 August 2009). Four proposed applications, three for SFTFs and one for new discharge of stormwater associated with construction activities, could not initially be identified by Southeast Regional Office Records Management staff although the files were ultimately available for review during the scheduled appointment. When DRN staff asked about the confusion, we were informed files for new permits are not created in Records Management until they receive the package from the permitting program. In other words, files for new permits do not exist in Records Management until a decision has been made on the permit application. Should someone ask to review a file for a new permit, Records Management is supposed to check with the permitting program and make the file available for review even though there is no formal file for the project. However, the delay in establishing a file in Records Management until a decision is made may be presenting barriers to the review of permit applications by interested persons, potentially thwarting the goal of full satisfaction of public participation.

When new, additional or increased discharges of sewage are proposed for HQ or EV waters, the opportunity for meaningful public participation does not come when the notice of proposed discharge is published in the *Pennsylvania Bulletin*, but rather much earlier, when the applicant seeking the permit publishes notice of a new sewage facility plan module or sewage facility plan revision in a local newspaper. These modules or revisions will become part of the municipality's Act 537 plan, so named after the Pennsylvania Sewage Facilities Act (1965 P.L.1535, No.537).

The permit applicant is required to submit to DEP any public comment received on its proposed sewage facility plan module or sewage facility plan revision. By the time that the notice of the discharge permit application appears in the *Pennsylvania Bulletin*, the DEP has already made tentative determinations of proposed effluent limitations and special conditions for proposed discharges as part of the sewage facility permitting process. It is unlikely that public comment received at the time the permit application is published in the *Pennsylvania Bulletin* will have any meaningful impact upon the proposed discharge (PA DEP staff, Personal Communication, 13 October 2009). This is reflected in the prompt processing seen by DRN during its two year review of New or Expanded Facility Permits, Renewal of Major Permits and EPA Nonwaived Permit Applications proposed for HQ or EV waters.

Although interested persons may recognize the importance of commenting upon a specific permit proposed to impact an HQ or EV water, the need to comment on an Act 537 sewage facility planning module or plan revisions may not be as well understood. Better mechanisms for making interested persons aware of the opportunity to comment on Act 537 sewage facility planning modules or plan revisions are necessary. Special notification of new or expanded discharges proposed for HQ or EV streams through an Act 537 sewage facility planning module or plan revisions should be required. While DEP does not publish notices of application for a new sewage facility plan or plan revision in the *Pennsylvania Bulletin*, it does publish plan approval/disapprovals, suggesting that notices of Act 537 sewage facility planning or plan revisions could readily be included in weekly listings.

Additionally, Pennsylvania's antidegradation guidance details public participation opportunities, but fails to anticipate the changing nature of print media—decline in circulation, decreased advertising revenues and bankruptcies. Between March 2007 and December 2009, eleven metropolitan dailies closed and eight more adopted hybrid online/print or online-only models.²³⁷ In response, DEP must

²³⁷ Gillin, Paul. n.d. Newspaper Death Watch. Retrieved from <http://newspaperdeathwatch.com/>.

update its guidance and provide for online posting of notifications and provide a mechanism for wider access to information about sewage facility planning or plan revisions.

Recommendations

State Level

- Improve accuracy of information listed in the *Pennsylvania Bulletin*.
- Require consistency for permit number formatting and characters.
- Ensure complete application information is listed in the *Pennsylvania Bulletin*.
- Update Chapter 93 to ensure that it includes complete and accurate stream designation for all HQ and EV waters.
- Revise recordkeeping procedures to ensure that DEP Records Management staff can readily procure files on proposed permit numbers upon review request by interested persons.
- Include in the *Pennsylvania Bulletin* notification of new or expanded discharges proposed for HQ or EV streams through an Act 537 sewage facility planning module or plan revisions.
- Improve and update communication outlets regarding public participation opportunities for Sewage Facilities Planning.
- Update antidegradation guidance to provide for wider access to information.
- Improve usability of eFACTS²³⁸ for viewing permitted discharger data by including more extensive violation and enforcement information as well as the ability to search for a facility by watershed.
- Improve the usability of eMapPA²³⁹ by including a layer for HQ and EV streams.
- Provide maps of gas drilling permits overlain with HQ and EV watersheds to make it possible to determine how many drilling permits are operating in each HQ or EV watershed.
- Improve the usability of eNotice²⁴⁰ by including receiving stream information in email notices.

Individual Level

- Read the *Pennsylvania Bulletin* regularly or go online to www.pabulletin.com to search the current issue to be aware of discharges proposed for your local HQ or EV streams.
- Sign up for DEP's eNOTICE electronic notification system to receive permitting information. After you sign up to receive electronic notices about permitting for your municipality, your county or statewide, you'll receive email notification of any permits that are applied for or issued within selected geographic area.
- Read the legal section of your local newspaper to be aware of permit actions that may be advertised there. The permitting process for some stream impacts requires that notices requesting public comment be placed in community newspapers. The publication of these notices can also provide an opportunity to request a public hearing on a proposed permit.
- When a new, additional or increased discharge is proposed for HQ or EV water, request a public hearing during the public comment period.

²³⁸ eFACTS is available online at <http://www.ahs2.dep.state.pa.us/eFactsWeb/default.aspx>.

²³⁹ eMapPA, is available online at <http://www.emappa.dep.state.pa.us/emappa/viewer.htm>.

²⁴⁰ eNotice is available online at <http://www.ahs2.dep.state.pa.us/eNOTICEWeb/Default.aspx>.

❖ Habitat Protection and Restoration

Streamside forests help to buffer streams from impacts on the landscape, reducing the movement of pollutants into streams and even increasing the ability of streams to bear the impact of pollutants.²⁴¹ But when streams lose forest cover, they lose pollution sensitive macroinvertebrates. A diversity of macroinvertebrates, including the pollution sensitive ones, is necessary for a stream to score highly enough on special protection surveys to qualify as HQ or EV streams. With growing recognition of the benefits buffers afford for stream health, regulatory protection for buffers has gained support.²⁴²

The DEP recently revised Chapter 102 of the Pennsylvania Code, addressing Erosion and Sediment Control.²⁴³ One positive change is that DEP now requires 150-foot buffers on EV and HQ streams that are meeting their designated use, and 150-foot *forested* buffers on EV and HQ streams that are not meeting their designated use. This buffer requirement is a far cry from the mandatory 100-foot statewide standard and 300-foot buffers for HQ and EV waters that had been proposed under the Pennsylvania Campaign for Clean Water's *Buffers 100* initiative,²⁴⁴ but at least is a first step. However, undermining the spirit of this protection is a waiver for natural gas drilling for pad sites that are within 100 feet of a spring, stream, body of water, or wetland. By completing a simple, two-page form, gas drillers are allowed to place drilling operations and their associated toxic chemicals in flood zones and other vulnerable areas, disregarding requirements that are intended to protect these sensitive areas.²⁴⁵

Municipalities can pick up where Chapter 102 ends and pass riparian buffer ordinances in line with the recommendations of the Buffers 100 initiative. A survey of Pennsylvania municipalities by Clean Water Action found that nearly 200 municipalities in a dozen counties had buffers ordinances in place to protect streams.²⁴⁶ Of the municipalities surveyed by Clean Water Action, nearly one third required 100-foot buffers for new developments; some required as much as 300-foot buffers for HQ and EV streams.²⁴⁷ However, some municipalities are doing little to protect riparian buffers, requiring only very narrow buffers and allowing uses like paving and parking lots in these "protected" areas.²⁴⁸ As municipal leadership turns over frequently, leadership on buffer protection at the state level is critical to preventing a rollback of local buffer protection by those unaware of the benefits of buffers.

During its review of new, additional or increased discharges associated with Coal and Noncoal Mining Activity Applications proposed to impact HQ or EV streams, DRN noted a number of revision applications. Proposed revisions are submitted to DEP in order to revise an existing permit to

²⁴¹ Stroud Water Research Center. 2009. Understanding Stream Conditions: Lessons from an 11-Year Study of Macroinvertebrates in Eastern Pennsylvania's Schuylkill River Watershed, with a Focus on Exceptional-Value and High-Quality Streams. Retrieved from http://www.stroudcenter.org/schuylkill/Schuylkill_Summary.pdf.

²⁴² New Jersey Department of Environmental Protection. 2008. Buffers on Category One Waters. Retrieved from http://www.state.nj.us/dep/wms/bwqsa/BUFFER_Fact_Sheet_2.pdf.

²⁴³ 40 Pa.B. 4861.

²⁴⁴ Pennsylvania Campaign for Clean Water. 2008. Buffers 100. Retrieved from <http://www.pacleanwatercampaign.org/pdfs/bufferfactsheet.0908.pdf>.

²⁴⁵ PA DEP. 2010. Request for Waiver of Distance Requirements from Springs, Stream, Body of Water, or Wetland . Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-79121/5500-PM-OG0057.pdf> .

²⁴⁶ Clean Water Action. 2009. Taking a Positive Trend Statewide. Retrieved from <http://www.cleanwateraction.org/files/publications/pa/CleanWaterAction-BuffersReport-200904.pdf>.

²⁴⁷ Clean Water Action. 2009. Taking a Positive Trend Statewide. Retrieved from <http://www.cleanwateraction.org/files/publications/pa/CleanWaterAction-BuffersReport-200904.pdf>.

²⁴⁸ Upper Darby Township Zoning Code. Section 704. Riparian Corridor Overlay District. 2010. Retrieved from http://www.upperdarby.org/Zoning/Article_VII.html.

accommodate proposed changes to the mining operation. Given the scope of activities covered by a mining permit,^{249,250} it is not surprising that changes to mining operations might arise requiring DEP to consider a revision of a mining permit. Frequently, proposed revisions address the need to add or remove acreage from permitted mining areas.

DRN is also concerned about proposed revisions to modify approved revegetation plans after mining is completed. Mines may be active for many years; coal mining operation permits must be renewed every five years, but noncoal mining operations are permitted for the life of the mine (permits for discharges associated with all mining activities must be renewed every five years). The planned post-mining land use will likely have been approved years, even decades, before mining operations cease. A proposal to commence a mining operation in an area may initially generate interest resulting in public participation in the permitting process. Proposals to commence a mining operation commonly contain plans to revegetate the post mining area as forestland, but subsequently a revision will be submitted to modify the post mining land cover from forestland to cropland, grassland or pasture. DRN observed two such revision applications during its two year review. However, the science is clear that a forested riparian buffer protects stream health best.

Where HQ or EV waters are impacted by mining operations, reforestation should be required as post-mining land cover. Proper monitoring and maintenance by the mining company should be required for at least 10 to 15 years after planting to make sure the forest becomes established and exotic invasive plants are controlled. No revision to allow cropland, grassland or pasture as post mining land cover should be allowed. Increased forest cover does result in improved water quality and biological diversity. Mandatory reforestation of post mining areas would benefit water quality and the maintenance and protection of HQ and EV waters. This same provision should be required for lands used for oil and gas exploration and extraction.

DRN did not review the permitting of natural gas exploration or extraction, but with much of the natural gas drilling in Pennsylvania's Marcellus Shale poised to impact HQ and EV waters, a requirement to re-establish forest cover should be considered after a well has been closed. Proper monitoring and maintenance, to make sure forest becomes established and exotic invasive plants are controlled, should be required for at least 10 to 15 years after planting.

In response to Crum Creek Neighbors assertion that the Pulte Homes development would affect baseflow of the EV segment of Holland Run, the EHB reiterated the principle that found that stream degradation results not only from discharges to a stream, but also from changing a stream's course, movement, circulation or flow including baseflow.²⁵¹ But stream baseflow is being affected, particularly in southwestern Pennsylvania where streams are at risk from dewatering from underground bituminous mining.²⁵²

²⁴⁹ PA DEP. 2007. Anthracite Surface Mine Permit Application. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9728>.

²⁵⁰ PADEP. 2006. Large Scale (Industrial Minerals) Mine Permit Application. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9719>.

²⁵¹ Crum Creek Neighbors v. Commonwealth, DEP and Pulte Homes, EHB Docket No. 2007-287-L. 2009. Retrieved from <http://ehb.courtapps.com/efile/documentViewer.php?documentID=4561>.

²⁵² Schmid & Company, Inc., Consulting Ecologists for Citizens Coal Council. 2010. A Need to Identify "Special Protection" Status and Apply Existing Use Protections to Certain Waterways in Greene and Washington Counties, Pennsylvania. Retrieved from http://www.schmidco.com/Schmid_Co_SpecialProtectionStatus_26_April_2010.pdf.

In order to protect streams from degradation resulting from mining induced flow losses, DEP's technical guidance for underground bituminous mines now requires mine applicants provide observations and measurements of baseline monitoring of stream flow for at least two years prior to mining as well as baseline information on fish and macroinvertebrate communities.²⁵³ DEP must conduct the analysis necessary to determine if a stream is at risk of being dewatered by underground mining. When an EV stream is at risk of being dewatered and degraded, an underground bituminous mine permit application DEP must not be approved.

In addition, the monitoring data now required to be collected for underground bituminous mining applications should be used to supplement DEP stream assessments. Schmid & Company found streams with designated uses of HQ or lower to be attaining EV uses, especially in undisturbed forested headwater sections of stream in Greene and Washington Counties.²⁵⁴ When stream habitat assessments and water quality data is submitted to the California (PA) District Mining office, which oversees underground bituminous mine permitting, this monitoring data should be forwarded to DEP's Division of Water Quality Assessment and Standards for consideration for special protection surveys. Similarly, monitoring data collected under an expanded Healthy Waters Initiative should be made available to the California District Mining office for use in considering streams at risk from dewatering.

Recommendations

State Level

- Do not allow waivers or general permits for mining or drilling activities impacting HQ or EV streams.
- Require reforestation for post-mining or drilling land cover in areas where HQ or EV streams are impacted by mining operations.
- Require post-mining or drilling monitoring and maintenance of land cover for at least 10 to 15 years after planting to ensure that forests are established and exotic invasive plants are controlled.
- Use underground bituminous mine application monitoring data to guide special protection surveys.
- When available, use Healthy Waters Initiative monitoring data to supplement knowledge of streams at risk for degradation through dewatering from underground bituminous mining.
- Require mining and drilling companies support the cost of monitoring equipment and data collection as a condition of their discharge permits.

Community Level

- Pass buffer ordinances requiring 100-foot forested buffers on either side of every stream from top of the bank or, if greater, a fully vegetated 100-year floodplain.
- Require an additional 50-foot forested buffer for first and second order streams.
- Pass buffer ordinances requiring 300-foot forested buffers on either side of HQ and EV streams.
- Require buffer restoration be with native trees and shrubs.

Individual Level

- Reforest your streamside property using native trees and shrubs.
- Reduce the amount of lawn on your property and increase native plants in your garden habitat.

²⁵³ PA DEP. 2005. Surface Water Protection – Underground Bituminous Coal Mining Operations. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48204/563-2000-655.pdf>.

²⁵⁴ Schmid & Company, Inc., Consulting Ecologists for Citizens Coal Council. 2010. A Need to Identify “Special Protection” Status and Apply Existing Use Protections to Certain Waterways in Greene and Washington Counties, Pennsylvania. Retrieved from http://www.schmidco.com/Schmid_Co_SpecialProtectionStatus_26_April_2010.pdf.

Appendix A: §131.12 Antidegradation policy

(a) The State shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy pursuant to this subpart. The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following:

(1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

(2) Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

(3) Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

(4) In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act.

Appendix B: Pros and Cons of Various Antidegradation Tier Classification Schemes¹

	Pro	Con
Water body-by-water body	<ul style="list-style-type: none"> • Weighted assessment (biological, chemical, & physical) • Coincides best with bioassessment • Advance placement of waters • Focus resources on high quality waters 	<ul style="list-style-type: none"> • Some waters may not be adequately protected • Must decide what data is needed to make assessment • Adequate data may not be readily available • High up front workload need • Delay in implementation and need for procedures to address antidegradation before listing decisions are made • More potential for disputes, challenges and litigation
Pollutant-by-pollutant	<ul style="list-style-type: none"> • More waters receive higher protection • Little or no upfront workload • More conventional, straightforward when it comes to actual analysis of degradation • Avoids disputes involved in making a decision on the overall water quality of waters • Can be immediately implemented, as new or increased discharges arise 	<ul style="list-style-type: none"> • Potentially more reviews, more work down the road • Water column data needed, uncertain how biological data could be used • No list (no advance placement), case-by-case placement of waters makes planning more difficult • More difficult to track because of the numerous pollutant-water body combinations • May not focus implementation efforts on truly high quality waters
Hybrid	<ul style="list-style-type: none"> • Identifies waters that need to be protected and allows for some flexibility for water bodies that aren't supporting a beneficial use • Best accommodates all three tiers of protection, allowing blended approach • Seems to be most common and practicable 	<ul style="list-style-type: none"> • Could be confusing • Carry's several of the con's from both approaches above

¹ Idaho Department of Environmental Quality. 2010. Idaho Antidegradation Implementation Discussion Paper: Waterbody-by-Waterbody or Pollutant-by-Pollutant. Retrieved from http://www.deq.idaho.gov/rules/water/58_0102_1001_discussion_paper.pdf.

Appendix C: Overview of Small Flow Treatment Facilities (SFTF)

When an on-lot system fails, an alternative sewage treatment approach for that lot must be identified. In Pennsylvania, that alternative is often a direct discharge to a stream. Sewage treatment facilities serving single-family homes, duplexes or small commercial establishments with flows not greater than 2,000 gallons per day that discharge to a stream are called Small Flow Treatment Facilities (SFTF) and require a NPDES permit from DEP.

Pennsylvania municipalities are required to prepare a base sewage treatment plan, or Act 537 plan, after the Pennsylvania Sewage Facilities Act, to guide future development in the municipality as well as correct sewage treatment problems. An on-lot system failure in an area that is designated to be served by on-lot systems requires an update or amendment to the 537 plan. The individual seeking to replace an on-lot system must first reach agreement on a treatment alternative with municipal officials. Then an update to the Act 537 plan or planning module must be prepared and approved by the municipality. Notice of the planning module or proposed amendment must be published in local papers to invite local comment. After the alternative system has been approved locally, the planning module or plan amendment requires DEP approval. Only after the Act 537 planning for an alternative treatment system has been approved at both the municipal and agency level can an application for a SFTF and NPDES permit be submitted.

DEP's technical guidance manual for SFTFs notes that proposals for discharges to HQ or EV waters must qualify for an individual NPDES permit which requires notice of application in the *Pennsylvania Bulletin*. However, by the time these applications are published in the *Pennsylvania Bulletin*, the proposed discharge has already been approved under Act 537 planning, limiting the impact of public comment at this point in the permitting process. Publication of applications for SFTFs in the *Pennsylvania Bulletin* may fulfill Federal Clean Water Act requirements for public notice to impact HQ or EV waters, but it falls short of the spirit of the law.

When SFTFs are proposed, DEP does not conduct a nondischarge alternatives analysis since the SFTF is generally required as a result of a failing on-lot system. Instead, DEP conducts an analysis of the discharge to determine if it will result in measurable change in the receiving stream. If the agency's analysis predicts that no measureable change will result, then the discharge is considered non-degrading and is permitted to the HQ or EV waters. The SFTF application and NPDES permit will be approved although special conditions may be required. No SEJ review is required because the discharge is considered non-degrading. Even were a SEJ review conducted, DEP's position is that correction of a public health problem—untreated sewage potentially discharging to streams—satisfies requirements for a discharge to an HQ or EV water (DEP staff, Personal Communication, 13 October 2009).

In Pennsylvania, no permit is required for the installation of a recycling, incinerating or composting toilet or another type of water conservation device if proposed for an existing residence or facility and no alteration of the on-lot system is proposed. These options appear to rarely be considered as non-discharge alternatives to SFTFs, perhaps due in part to limited understanding of these systems by municipal officials. Municipalities may be unwilling to approve complicated treatment systems for which they may one day have to assume responsibility. More effort needs to be made by DEP to encourage the use of composting toilets and other non-discharge strategies before defaulting to a discharge to an HQ or EV stream to correct on-lot system failures.

Appendix D: Comparison of Stormwater Best Management Practices (BMPs)

Stormwater BMPs recommended for minimizing erosion and sedimentation and managing stormwater before, during, and after earth disturbance activities¹:

Non-Structural BMPs

Protect Sensitive and Special Value Resources

- Protect Sensitive/Special Value Features

- Protect/Conserve/Enhance Riparian Areas

- Protect/Utilize Natural Flow Pathways in Overall Stormwater Planning and Design

Cluster and Concentrate

- Cluster Uses at Each Site; Build on the Smallest Area Possible

- Concentrate Uses Area wide through Smart Growth Practices

Minimize Disturbance and Minimize Maintenance

- Minimize Total Disturbed Area – Grading

- Minimize Soil Compaction in Disturbed Areas

- Re-Vegetate and Re-Forest Disturbed Areas, Using Native Species

Reduce Impervious Cover

- Reduce Street Imperviousness

- Reduce Parking Imperviousness

Disconnect/Distribute/Decentralize

- Rooftop Disconnection

- Disconnection from Storm Sewers

Source Control

- Streetsweeping

Structural BMPs

Volume/Peak Rate Reduction by Infiltration BMPs

- Pervious Pavement with Infiltration Bed

- Infiltration Basin

- Subsurface Infiltration Bed

- Infiltration Trench

- Rain Garden / Bioretention

- Dry Well / Seepage Pit

- Constructed Filter

- Vegetated Swale

- Vegetated Filter Strip

- Infiltration Berm & Retentive Grading

Volume/Peak Rate Reduction BMPs

- Vegetated Roof

- Runoff Capture & Reuse

Runoff Quality/Peak Rate BMPs

- Constructed Wetland

- Wet Pond/ Retention Basin

- Dry Extended Detention Basin

- Water Quality Filters & Hydrodynamic Devices

Restoration BMPs

Riparian Buffer Restoration.

Landscape Restoration

Soils Amendment & Restoration

Floodplain Restoration

Other BMPs and Related Structural Measures

Level Spreader

Special Detention Areas – Parking Lot, Rooftop

Additional guidance for special protection BMPs to maintain and protect water quality²:

Special protection BMPs include, but are not limited to:

- Adopting special sediment basin requirements.
- Lining channels, collectors, and diversions with vegetation, rock, geotextile, or other nonerosive materials.
- Immediately stabilizing disturbed areas upon completion or temporary cessation of an earth disturbance activity.

For Post Construction Stormwater Management:

- Infiltration BMPs should be used to the maximum extent possible.
- Water quality treatment BMPs must be employed where necessary to ensure the protection and maintenance of water quality.
- Volume and rate of stormwater discharges must be managed to prevent the physical degradation of receiving waters.

Additional guidance for special protection BMPs includes evaluating and including nondischarge alternatives in both Erosion and Sediment Control and Post Construction Stormwater Management plans, unless it can be demonstrated that nondischarge alternatives do not exist.³ When no nondischarge alternatives exist, the Erosion and Sediment Control and Post Construction Stormwater Management plans must include ABACT, except as provided in §93.4c(b)(1)(iii).⁴

1. PA DEP. 2006. Pennsylvania Stormwater Best Management Practices Manual. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-68851/363-0300-002.pdf>
2. PA DEP. 2003. Water Quality Antidegradation Guidance Manual. Retrieved from <http://www.elibrary.dep.state.pa.us/dsweb/Get/Version-47704/391-0300-002.pdf>.
3. §102.4. Erosion and sediment control requirements.
4. §102.8. PCSM requirements.

Appendix E: Pennsylvania Bulletin Permit Application Notices - Inaccuracies, Inconsistencies, and Omissions

The *Pennsylvania Bulletin* is the Commonwealth's official gazette for information and rulemaking. Every week, the *Pennsylvania Bulletin* publishes State agency notices including applications before the DEP as well as the agency's actions on those applications. The *Pennsylvania Bulletin* is also available online, www.pabulletin.com, and the latest applications and actions can be viewed every Friday at 9:00 am EDT when the current issue is posted on the website.

Over the two-year period from January 1, 2008, to December 31, 2009, the DRN reviewed the *Pennsylvania Bulletin* for information on applications for discharges to Pennsylvania's HQ or EV surface waters to gain insight regarding barriers that may be affecting the abilities of interested persons to provide DEP with the information called for in Pennsylvania's antidegradation policy. During this review, DRN identified what appear to be inaccuracies, inconsistencies, and omissions as well as problems with recordkeeping procedures regarding notices of actions before DEP that were posted in the *Pennsylvania Bulletin*. Examples along with recommended corrections follow:

Example 1: We found the same permit number assigned to multiple applications. Under *NPDES Individual Permit Applications for Discharges of Stormwater Associated with Construction Activities*, NPDES Permit Number PAI011508027 appears to have been assigned to two different applications (38 Pa.B. 1969, Saturday, April 26, 2008):

Applicant Name & Address	County	Municipality	Receiving Water/Use
D & H Ventures, LP 977 East Schuylkill Road Pottstown, PA 19465	Chester	North Coventry Township	UNT Schuylkill River HQ-TSF
Phoenixville Crossing, LP 1055 West Lakes Drive, Suite 170 Berwyn, PA 19312	Chester	East Pikeland Township	UNT Schuylkill River HQ-TSF

Permit Number PAI024503001 also appears to have been assigned to two different applications (33 Pa.B. 1252, March 8, 2003 and 33 Pa.B. 2660, June 7, 2003 respectively):

Applicant Name & Address	County	Municipality	Receiving Water/Use
Best Burger, Inc. 17 Stratton Rd. Matawan, NJ 07747	Monroe	Hamilton and Stroud Townships	Pocono Creek HQ-CWF
Ridgeview Estates Phase III Bruce Rarick, Bernard and Charles Bann 401 W. Preston Ave. Girardville, PA 17935	Schuylkill	Ringtown Borough Union Township	Little Catawissa Creek Dark Run HQ-CWF

Example 2: We found a change in the receiving stream, from notice of application to notice of action, for NPDES Permit Number PAI023908003 with no notice of revision or opportunity for comment (39 Pa.B. 2816, Saturday, June 6, 2009 and 39 Pa.B. 5031, Saturday, August 22, 2009 respectively):

Applicant Name & Address	County	Municipality	Receiving Water/Use
Kings Real Estate Dev. Management Co. Attn: Carmen Tessitore 315 South Cedar Crest Boulevard Suite 300	Lehigh	Upper Macungie Township	Little Lehigh Creek HQ-CWF

Allentown, PA 18103

Kings Real Estate Development & Management Co.
315 South Cedar Crest Boulevard
Allentown, PA 18103-3600

Lehigh Upper Macungie Township

Jordan Creek
TSF, MF

Example 3: We found inconsistent permit numbering which limits the functionality of the *Pennsylvania Bulletin's* online search tool. The inconsistent use of formatting and characters, especially in designating revisions and amendments, can produce incomplete results. For example, a search for PAI011507059 returned links to the notice application and action for this permit, but a search for 1507059 returns no documents matching the query. By contrast, a search for PAI010907018 returned no documents matching the query; only a search for 0907018 returned links to the notice application and action for this permit. A search for PAI-0306-08-012 returned 300 matches (as did a search for Oak Grove Partners):

NPDES Permit No.	Applicant Name & Address	County	Municipality	Receiving Water/Use
PAI011507059	Roosevelt Hairston, LLC 385 Conestoga Road Malvern, PA 19355	Chester	West Vincent Township	Pickering Creek HQ-TSF
PAI01 0907018	Buckingham Properties, LP P.O. Box 182 Holicong, PA 18929	Bucks	Solebury Township	Aquetong Creek HQ-CWF
PAI-0306-08-012	Oak Grove Partners, LLC Gary McEwen P.O. Box 559 380 South Twin Valley Road Elverson, PA 19520	Berks	Robeson Township	Hay Creek EV
PAI011506076A2	Warwick Township 2500 Ridge Road Elverson, PA 19520	Chester	Warwick Township	French Creek EV
PAI024804003(1)	Nic Zawarski & Sons Developers, Inc. Attn: Tarus Zawarski 1441 Linden Street Bethlehem, PA 18018		Northampton Forks Township	Bushkill Creek HQ-CWF

Example 4: Mining Permit 40840202R5 and NPDES Permit Number PA0613703, Silverbrook Anthracite, Inc., submitted for renewal (39 Pa.B. 5932, Saturday, October 10, 2009), of an existing anthracite coal refuse reprocessing and preparation plant operation in Laflin Borough, Luzerne County, indicated the affected receiving stream to be Garden Creek. No stream designation was indicated. A cross reference with Chapter 93 Water Quality Standards found no Garden Creek in Luzerne County, but did find a Gardner Creek designated CWF, MF. At least one prior renewal application for this mine also lists Garden Creek as the receiving stream which suggests that the accuracy of the data submitted by the applicant, at least in this case, was not confirmed. Such an action could lead to streams not receiving the protection they deserve should the applicant submit incorrect stream designation information. When identified, inaccuracies in applications need to be corrected in order for interested persons to provide meaningful comment.

Example 5: We found named HQ and EV streams listed as receiving waters in permit applications (see NPDES Permit Number PAI010906022), but the streams do not appear in Chapter 93, where Pennsylvania’s water quality standards are found, nor do they appear on DEP’s online *Existing Uses Classification Table*, the mechanism the agency utilizes to list streams with changed uses prior to rule-making and listing in Chapter 93 (The *Existing Uses Classification Table* is available online at <http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Existing%20Use/EU%20table%20list.pdf>).

NPDES Permit No.	Applicant Name & Address	County	Municipality	Receiving Water/Use
PAI010906022	Sal Lapio Homes 104 Mill Road Sellersville, PA 18960	Bucks	Nockamixon Township	Rapp Creek EV

With permit applicants being referred to Chapter 93 and the Existing Uses List to identify the classification of the receiving water, Chapter 93 and the Existing Uses List must contain complete and accurate stream designation information in order for HQ and EV streams to receive the protection they deserve.

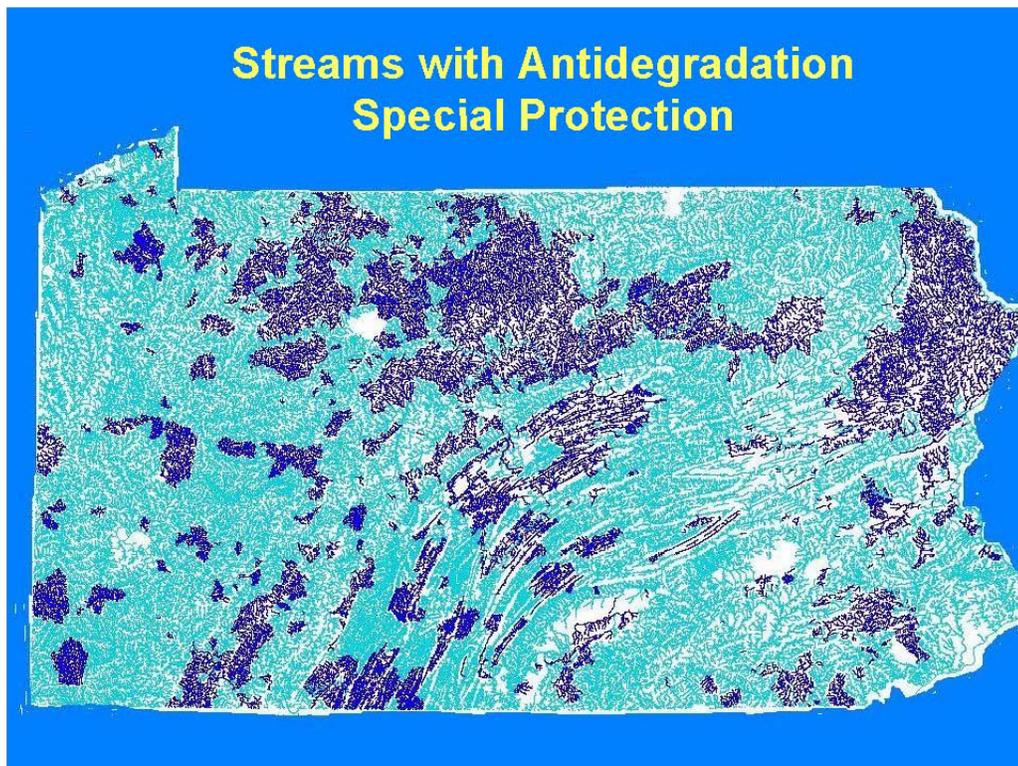
Example 6: Over the course of DRN’s two year review, we noticed the most inconsistency regarding inclusion of stream designations in permit applications in Coal and Noncoal Mining Activity Applications. However, in recent months this information was included in mining permit applications with increasing consistency across all District Mining offices except for the Pottsville office. The Pottsville District Mining office does generally list the designation when the receiving stream is an HQ or EV water, but otherwise no designation is listed. The interested person, who is not regularly reviewing mining permit applications, must then consult Chapter 93 and the Existing Uses List for the stream designation. As the applicant is required to indicate the stream designation in their application, listing that designation in the application notice should be standard practice for all District Mining offices regardless of whether or not the stream is an HQ or EV stream and whether the application is for a new, additional or increased discharge.

Appendix F: HQ/EV Streams and Marcellus Shale Gas Development

The pressure to find alternatives to foreign oil, combined with developments in drilling technology, has resulted in intense interest in the production of natural gas from shale. The use of the hydraulic fracturing process, also referred to as fracking, to extract natural gas from shale is underway in 34 states in this country, but the use of fracking is also being considered in other countries where shale gas reserves are found.

Fracking, combined with horizontal drilling techniques, has allowed shale gas that was not previously considered economically viable to become the focus of attention in the energy industry. But the fracking process requires the use of hazardous chemicals and drilling fluids, along with an average of 4.5 million gallons of water per well. The result of fracking is large quantities of toxic gas drilling wastewater, at least 19 million gallons per day by 2011 according to the Pennsylvania Department of Environmental Protection (DEP). The enormous scale of shale gas development that is planned by the industry presents a serious threat to human health in the communities where gas drilling occurs as well as to the environment and water resources.

The current focus for unconventional gas drilling is the Marcellus Shale, which extends from West Virginia to New York. A comparison of the locations of Pennsylvania's HQ and EV watersheds (See *Streams with Antidegradation Special Protection*) shows considerable overlap with the extent of Pennsylvania underlain by the Marcellus Shale (See *Marcellus Shale Formation*). The pressure to tap the Marcellus Shale represents a threat to Pennsylvania's cleanest streams.



Shaw, Tony. 24-25 July, 2007. Pennsylvania's Department of Environmental Protection and Water Quality Monitoring Program. Presented at National Water Quality Monitoring Council Meeting, PA. Retrieved from acwi.gov/monitoring/ppt/philadelphia_0707/padep_shaw_0707.ppt

demonstrating how quickly natural gas drilling could proceed in the Delaware River watershed if the regulatory doors are opened (the current moratorium on gas drilling in the watershed will be discussed below). Of Wayne County's 43 named stream reaches listed in Chapter 93, only seven lack protection as HQ or EV streams. In other words, 82% of Wayne County's named stream segments are considered among Pennsylvania's cleanest streams and are supposed to be protected from degradation.

Current natural gas permitting practices do not provide confidence that Pennsylvania's cleanest streams will be protected from harm. Real protection would be the banning of Marcellus Shale development within HQ and EV watersheds. When it comes to the significant earth disturbances associated with road and pad construction, BMPs for sediment and erosion control have been shown to fail to provide the antidegradation standard of protection required under the Clean Streams Law. A study by the Academy of Sciences of Philadelphia found that in watersheds with high density drilling, water conductivity was almost twice as high.¹ High conductivity can be an indicator of contamination by salts that are a component of drilling wastewater. Furthermore, Academy researchers found that populations of those aquatic organisms that are sensitive to pollution were diminished by 25% in streams with the most drilling activity.

As of this publication, DEP does not require individual permits for oil and gas drilling associated earth disturbances of less than five acres. For facilities with less than five acres of disturbance, a streamlined general permit is used and an Erosion and Sediment Control Plan is required but need not be submitted to the agency for review. Moreover, DEP has created a fast track process that allows NOIs to be submitted as late as 14 days before the proposed earth disturbance. Legal challenges by environmental organizations have resulted in reports that DEP may drop its expedited permitting process and require individual permits in HQ or EV watersheds,² however questions remain as to how the agency will bring about this change (the proposed process will be put out for public comment) and the potential exists for counter challenges from gas drillers mean that for now HQ and EV streams are still at risk from impacts from gas drilling.

The current administration in Harrisburg seems willing to let the energy industry run roughshod over the environment as evidenced by a short-lived effort by the DEP secretary to limit the ability of field inspectors to cite drillers for violations. One of Governor Corbett's first acts was to repeal policies put in place by his predecessor to minimize environmental impacts from shale gas drilling on lands. Even as he proposed reducing aid to colleges and universities by 50%, Governor Corbett urged colleges located atop the Marcellus Shale to make up any budget shortfalls by allowing drilling.

DRN research and supplemental analyses prepared by experts retained by DRN have identified a number of broad categories of impacts from shale gas drilling that threaten the health of Pennsylvania's cleanest streams:

- Depletion of available freshwater and disruption of the hydrologic cycle and natural stream flows,
- Inadequate treatment of wastewater that can contain toxic chemicals and radioactivity,
- Contamination of both surface water and groundwater,
- Air pollution from vehicles, equipment, and dust and hazardous air emissions from chemicals associated with shale gas drilling as well as subsequent atmospheric deposition,
- Stormwater runoff from the construction of well pads, roads, pipelines, and other infrastructure,
- Erosion and sedimentation issues from infrastructure development,

- Environmental impacts associated with related gas production facilities, such as compressor stations, pipelines and from liquefied natural gas (LNG) plants which can emit nitrogen oxide and particulates known to aggravate asthma and respiratory diseases. In addition, extraction, processing, transportation and conversion of LNG can be a major source of greenhouse gasses.

Fifteen million people rely on the Delaware River for their drinking water, including New York City, Philadelphia, and one third of the population of New Jersey. The role of the Delaware River Basin Commission (DRBC) is to protect this water supply as well as the River's exceptional water quality and natural assets through regional watershed planning. The agency has classified the entire non-tidal River under their Special Protection Waters Program—an outcome directly resulting from DRN petitioning, advocacy and action over a 20-year period. Because DRBC determined that shale gas development has the potential to substantially impact the water resources of the basin, the agency used its regulatory power to institute a moratorium on shale gas production wells until natural gas-specific regulations can be put in place.

The Delaware River watershed is one of the few areas in this country where gas drilling has been delayed while stronger regulations are being considered. The protective, science-based regulations DRN is seeking from the DRBC can be a model for shale gas drilling best practices across the country and potentially around the world. A report commissioned by the U.S. Energy Information Administration identified shale gas reserves in 32 countries around the world. Production is expected first in countries, such as France, Poland, and Turkey, which already have elements of the necessary infrastructure in place. Some of the world's largest known shale reserves are in China, Argentina, and Mexico where the necessary infrastructure for extraction is not yet in place.

In December 2010, the DRBC, under extreme political pressure to lift the moratorium, released draft natural gas drilling regulations for the Delaware River basin instead of waiting for the completion of scientific studies, including a cumulative impact analysis, that could have informed the regulations. DRBC is now reviewing comments submitted on the draft regulations. When DRBC will put forward its final regulations is unknown, but it could be as soon as Fall 2011. Drilling in the Delaware River watershed would likely begin very soon if regulations are put in place.

1. Bauers, Sandy. 12 October 2010. Philly academy study finds gas drilling threatens streams. Philadelphia Inquirer. Retrieved from http://articles.philly.com/2010-10-12/news/24981559_1_drilling-researchers-study.
2. Gilliland, Donald. 7 July 2011. DEP to make gas wells near high quality streams go through full permitting process. Patriot News. Retrieved from http://www.pennlive.com/midstate/index.ssf/2011/07/dep_to_make_gas_wells_near_hig.html.



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