IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
HUNTINGTON DIVISION

OHIO VALLEY ENVIRONMENTAL COALITION, *et al.* Plaintiffs,	)	
v.	)	Civil Action No. 3:05-0784
	)	Civil Action No. 3:06-0438
UNITED STATES ARMY CORPS OF ENGINEERS, e*t al.*,	)	
Defendants.	)	

PLAINTIFFS' POST-TRIAL BRIEF

JOSEPH M. LOVETT
Appalachian Center for the
Economy and the Environment
P.O. Box 507
Lewisburg, WV 24901
(304) 645-9006
jlovett@appalachian-center.org

STEPHEN E. ROADY
JENNIFER C. CHAVEZ
Earthjustice
1625 Massachusetts Av. NW, Suite 702
Washington, DC 20036
Phone: (202) 667-4500
Fax: (202) 667-2356
sroady@earthjustice.org
jchavez@earthjustice.org

Counsel for the Plaintiffs

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TABLE OF CASES CITED

GLOSSARY

CDD	Combined Decision Document
Corps	Army Corps of Engineers
CWA	Clean Water Act
DEP	Department of Environmental Protection
Dkt.	Docket
Dr. Tr.	Draft Transcript
EPA	Environmental Protection Agency
FONSI	Finding of No Significant Impact
FWS	Fish and Wildlife Service
GIS	Geographic Information System
Guidelines	Section 404(b)(1) Guidelines
Mot.	Motion
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
Opp.	Opposition
OSM	Office of Surface Mining
P.I.	Preliminary Injunction
Pers. Comm.	Personal Communication
Reiss.	Reissued
SHU	Stream Habitat Unit
SWROA	Surface Water Run-Off Analysis

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INTRODUCTION AND SUMMARY OF THE ARGUMENT

The nearly two weeks of trial established that, in violation of the law, the defendant U.S. Army Corps of Engineers is permitting the destruction of headwater streams in West Virginia and the unique ecological functions they provide. The scope of the destruction caused by Defendants' Clean Water Act permits is enormous and ecologically significant. For the mines in this case, the Corps' permits allow coal companies at each site to bury several miles of headwater streams, and to clear and grub the surrounding riparian areas and forests. For these vital headwater streams, the destruction is permanent. The Corps concedes that dumping millions of tons of mine debris, rock and rubble into these streams and entombing them in valley fills eliminates them from the ecosystem forever. For the forests (the most ecologically diverse and productive temperate hardwood forests in the world), the destruction is profound and contributes to adverse effects on the aquatic environment. Although the Corps and the coal companies assert that the mined land will be reclaimed, the loss of the native forest topsoil that has been turned upside down and buried means that these areas will not recover for many decades, if ever. This destruction adds to the damage caused by filling streams.

On a regional scale, the federal government has acknowledged the enormous scope of the damage done by large-scale surface mining operations in Appalachia. A federal Programmatic Environmental Impact Statement issued in 2005 documented that mountaintop removal mining and valley fills had already destroyed 1,200 miles of headwater streams in the Appalachian region, and will totally eliminate nearly 1.5 million acres of hardwood forests within the next decade under current permitting practices.

By permitting the coal companies to proceed with mountaintop removal mining pursuant to permits issued under the authority of section 404 of the Clean Water Act ("CWA"), the Corps is engaging in action that significantly affects the quality of the environment. Accordingly, the

National Environmental Policy Act ("NEPA") prohibits the Corps from issuing each of the permits challenged in this case until it prepares an environmental impact statement that carefully evaluates the individual and cumulative impacts associated with each permit and closely considers alternatives. In violation of NEPA, however, the Corps has failed to prepare an EIS for any of these permits; instead it has prepared environmental assessments ("EAs") that do not adequately analyze the impacts of the permits or consider alternative approaches to filling vital headwater streams.

The Corps permits also allow the coal companies to adversely affect aquatic resources by filling headwater streams. Accordingly, the CWA prohibits the Corps from issuing each of these permits unless it can demonstrate that the permits will not degrade the aquatic environment or result in unacceptable adverse effects upon that environment. In violation of the CWA, the Corps has failed to make this demonstration.

Testimony presented by the Corps at trial was designed to show that the Corps followed the prescribed procedural steps for its CWA and NEPA regulatory process; those procedures have generated a great deal of paper for each of the permits in this case. At the end each application review process, the Corps asserted its conclusion: that permanently burying and destroying unique headwater streams and riparian habitat will not have a significant effect on the environment. However, a review of the administrative records, aided by expert scientific witnesses presented by Plaintiffs and Intervenors, and testimony of Corps regulatory officials, reveals that the Corps' conclusions are simply not supported by any available evidence. In fact, the Corps chose not to even gather the evidence necessary to make a determination.

The Corps claims that its permits comply with both NEPA and the CWA. Its argument is based on a central, unsupported assumption: that the proposed mitigation activities will "offset"

the impacts of this destruction by "restoring," "creating" or "enhancing" streams elsewhere. The evidence and testimony at trial demonstrated that this central mitigation assumption of the Corps and the coal companies is completely without support.

Most fundamentally, the trial showed that the Corps (i) utterly failed to measure and adequately analyze the nature of the resources destroyed as a result of its permits, (ii) failed to evaluate the key assumptions on which the mitigation plans are based, and (iii) failed to require the monitoring needed to ensure the mitigation will replace lost environmental resources.

The Plaintiffs seek declaratory and injunctive relief based on their consolidated complaints and the extensive briefs filed in this case, the evidence in the administrative record, and testimony and evidence presented at trial.[1]

STATEMENT OF FACTS

The testimony and evidence at trial painted a startling picture of arbitrary and unlawful action by the Corps in its review and approval of the applications for these four CWA permits. The Corps is allowing the coal companies to permanently destroy vital and significant swaths of the ecosystem of southern West Virginia with little oversight. The scale of this destruction is unprecedented in the United States. *See* Hook, *et al.*, Spatial Distribution of Human Geomorphic Activity in the U.S. (Pl. Trial Ex. 50). The Corps relies uncritically upon the data submissions from the coal companies, makes no effort to measure the functions (or even the structure) of the headwater streams that will be destroyed, enhanced, restored or created under authority of its permits. The Corps assumes, contrary to scientific evidence, that its mitigation plans offset the destruction of those streams by "creating" new ones while "enhancing" offsite

[1] The parties have also submitted briefs addressing separately the question whether the Corps exceeded its authority under the CWA in allowing non-fill pollutants to be discharged into the segment of stream between the valley fills and the outfalls of the sediment control ponds. *See* Pl. Mot. for Partial Summary Judgment (Dkt. # 118).

perennial streams, and relies upon an unscientific formula (the "Stream Habitat Unit" or "SHU" method) to help determine whether mitigation will replace lost aquatic resources.

The Corps does not provide a reasoned basis or substantial evidence supporting the decisions in this action. It offers only conclusory and unsubstantiated assertions. It makes generalized statements that some impacts may occur, but then fails to describe the effect or significance of those impacts on aquatic or terrestrial ecosystems. Instead, the Corps assumes in every case that its procedures will ensure that the impacts will be insignificant or will mitigate the impacts to insignificance. The Corps' feeble attempts to analyze the impacts of its permits are so general that they are meaningless.

I. The Nature of the Environment Destroyed by these Operations

As the coal companies have noted in this litigation, the mining operations – including valley fills and the terrestrial disturbances such as forest destruction associated with the mining process itself – simply cannot proceed without these CWA permits. *See* Memo in Opp. to Pl. Mot. for Prel. Inj., August 8, 2006, (Dkt. # 156) at 2 (stating that the Laxare East Mine "cannot construct valley fills needed to conduct surface mining operations" without the Corps' § 404 CWA permits). Thus, there is no dispute that the Corps' permits and the scope of the mining operations are interdependent; the permits allow the companies to conduct mining operations that destroy the mountains, wildlife and forests as they permanently bury miles of streams.

At trial, the Plaintiffs' experts described the vital and unique role of the hardwood forests and headwater streams that will be destroyed by the four mines whose permits are challenged here. In addition, Plaintiffs' expert pointed out that the surface mining is affecting significant percentages of several watersheds in southern West Virginia, and that the Corps has failed to consider the cumulative impacts associated with that mining.

A. Headwater streams destroyed by these permits are unique and significant

Dr. Palmer emphasized that headwater streams perform numerous functions that are essential to the proper operation of the ecosystem. These functions include water purification, nitrogen uptake, and decomposition. See Draft Transcript 2:133 -136 (Dr. Palmer discussing the functions listed on her Table of Functions, Int. Ex. 7).[2]

Both Dr. Wallace and Dr. Palmer stated that headwater streams perform unique and significant functions that are not duplicated further downstream. For example:

1. Dr. Palmer emphasized that the functions and the biota of headwater streams are unique; she also stated that headwater streams play a disproportionately important role in the ecosystem. Dr. Tr. 2:168-169 (headwater streams "we call it where rivers are born" are "the heart of the whole network" and those streams are disproportionately important for nutrient processing and biodiversity); *id*. at 212-213 (Palmer states that the functions in intermittent and ephemeral streams are "very, very different" from functions in intermittent streams and notes that certain species are unique to headwater streams and that nutrient processing is "much more efficient and faster in an ephemeral or intermittent stream") ; *id*. 6:97-99 (Palmer states that it is universally accepted that headwater streams play a disproportionately valuable role – they are at the top of the list as prime areas that need to be preserved).

2. Dr. Palmer explained that the rate and amount of groundwater exchange with headwater streams is key to water purification and that that process goes on at greater rate in headwater streams than in perennial streams. Dr. Tr. 6:104-105.

3. Dr. Palmer stated that you cannot replace unique headwater functions by enhancing perennial streams with boulders and wood. Dr. Tr. 2:148-149.

[2] The court reporter has delivered a Rough Draft Transcript of trial, separated into six parts - one for each day of trial. Accordingly, hereinafter the Plaintiffs will cite to the Draft Transcript as "Dr. Tr. [Day]:[page]-[page]."

Drs. Wallace and Palmer testified that the mining operations and the valley fills would permanently destroy the headwater streams and their ecological functions. For example, Dr. Palmer stated that valley fills "completely fill the streams and destroy all the living organisms in the streams as well as the functions that those streams would provide." Dr. Tr. 2:128.

The U.S. Fish and Wildlife Service (FWS) stated that it "believes that surface coal mines often adversely affect large areas of upland and wetland habitat, and in general, do not meet the standard of having 'no more than minimal' impacts on the environment." July 2, 2001 FWS Letter, at 1-2. (Ex. D to Pl. Comments on proposed Camp Branch Mine, Tab E3 in the Camp Branch Ad. Rec.) FWS described the environmental impact of coal mines in Appalachia on aquatic and terrestrial ecosystems as "unmitigatable" and "unprecedented." Sept. 20, 2001 FWS Letter, at 1. *Id*. Ex. E to Pl. Comments. FWS said it knew "of no other single type of activity, whether authorized by individual or general permit, with such significant individual and cumulative adverse environmental impacts as those currently authorized" by the Corps. *Id*. at 2. FWS described the consensus of scientists working in the field that "small first order streams form the heart and soul of the functional stream ecosystem in…. every watershed that has been carefully studied…. Clearly, any discussion of destroying even one first order stream is out of order…." *Id*. at 4. "These experts asserted that stream loss is unacceptable from a biological standpoint, and that there is no scientific basis on which to develop an acceptable loss threshold." *Id*. at 5.

In addition, forty-three "senior aquatic scientists," including "members of the National Academy of Sciences and its scientific Boards," "president[s] of national scientific organizations, and leading authors on the ecology, water quality, and biota of streams and rivers," stated in their comments on the proposed 2002 NWP 21 that:

> The available scientific evidence clearly demonstrates that the length of headwater streams in the landscape has been significantly reduced because of the mining and development activities that have been permitted under this program. . . . This loss of headwater streams has profoundly altered the structure and function of stream networks, just as eliminating fine roots from the root structure of a tree would reduce its chances of survival.

Oct. 5, 2001 Univ. of Georgia Comments, p. 1, *Id.* Ex. F to Pl. Comments. These scientists supported their conclusion by citing and attaching thirty articles in scientific journals. *Id.* The Corps permits at issue here do not take these and similar comments into consideration. Indeed, the Corps has never responded to or refuted these comments.

The coal companies presented testimony from Ed Kirk, Dr. Donald Cherry, and Dr. Mindy Armstead on the effects of mining operations on headwater streams. Each of these witnesses agreed that mining operations and valley fills would destroy these streams and would change the ecology of the area. Each of them also agreed that the mining operations and the valley fills would reduce biodiversity. For example:

1. Mr. Kirk noted that mayfly populations are reduced below the valley fills – probably due to a reduction in the quality of the water. Dr. Tr. 5:84-85.

2. Mr. Kirk also noted the importance of water quality and stated that the Corps "is really wanting us to look more at trying to improve water quality. It doesn't do any good to improve the habitat of a stream if the water quality is really, really poor." Dr. Tr. 5:88.

3. Dr. Cherry stated that the community structure below the valley fills will shift to a "more tolerant type and probably – and definitely a decline in mayflies, but I believe that the community structure will still be there to function and carry on."[3] See Dr. Tr. 5:121.

[3] Dr. Cherry later testified that he "dropped out" of the study of functions in the late 1970's and that he has "not kept up with the literature" on that subject. Dr. Tr. 5:124-125; see also id. at 165 (he lost touch with the research on functional analysis in the 1970's).

4. Dr. Cherry agreed that the "ecological diversity in the stream segments below the ponds [sediment ponds downstream from the valley fills] is almost always lower than it is in the native headwater first and second order streams." Dr. Tr. 5:162.

5. Dr. Cherry agreed that salamanders are being buried by the valley fills and noted that he had not seen any salamanders in third and fourth order streams (of the type that exist below the fills). Dr. Tr. 5:162-163.

6. Dr. Armstead testified that below the sediment ponds downstream of the valley fills, there is sometimes "reduced taxa richness." Dr. Tr. 5:202.

7. Dr. Armstead testified that functional processes such as photosynthesis and respiration go on at different rates in intermittent and ephemeral streams as distinct from the streams located below the ponds at the base of the valley fills. Dr. Tr. 5:226-228 (similar kinds of functions are ongoing downstream, but "I'm using it broadly and coarsely, not that it is functionally – not that it is having identical functional processes. All those things are happening. There is still primary productivity and secondary productivity, etcetera, but they're at different rates than what was happening before the stream was filled").

8. Dr. Armstead agreed that "species that are sensitive to things like pollutants and contaminants are negatively affected by the valley fills" and noted that mayflies "do disappear from below the fills." Dr. Tr. 5:234.

B. The hardwood forests surrounding valley fills are vital to the health of the aquatic ecosystem, and will not recover promptly after the mining operations are completed

Dr. Wallace explained that forests provide a vital source of wood and woody debris to the headwater streams. Dr. Tr. 1:235-36. Dr. Wallace also explained how the forest canopy that overhangs headwater streams directly affects the way in which life develops in those streams. Dr. Tr. 1:242-243.

Plaintiffs' expert on hydrologic impacts and revegetation at surface mines, Dr. Keith Eshleman, explained how forests protect against excessive runoff. Dr. Tr. 1:97-98, 104-105 (forests enhance the infiltration rate and thereby control runoff). For example, he noted that runoff from mining sites that have destroyed forests has been shown to be three times higher than runoff from adjacent, forested, lands. Dr. Tr. 1:114-115.

Dr. Eshleman further explained that surface mining dramatically changes the forested nature of the affected land as well as the soil that supports the forest. Dr. Tr. 1:106. He testified that reclamation and revegetation of forested Appalachian lands that have been destroyed through clearing and grubbing (pulling the trees and other vegetation out by the roots) is challenging and that re-growing hardwood forests does not happen quickly. Dr. Tr. 1:156-158.

Finally, Dr. Palmer noted that the ability of streams to be restored depends in part on the existence of source populations of macroinvertebrates. Dr. Tr. 2:130-131. Accordingly, Dr. Palmer testified that restoring or recreating streams may not be possible where the forest has been fragmented and destroyed such that source populations are not readily available. Dr. Tr. 2:129-131; Dr. Tr. 2:113-14 (the problem of possible colonization at the created stream at Camp Branch). Dr. Palmer also commented that without a forest canopy, the ability to restore or create these streams would be compromised. *Id.*

Dr. Eshleman explained how the mining operations destroy the forests and turn the soil upside down, thus making revegetation and reclamation difficult. Dr. Tr. 1:106-07, 120.

C. The Corps permits affect significant areas of the surrounding watersheds

Significant stream degradation caused by valley fill and mining activities was illustrated by testimony of Douglas Pflugh, Plaintiffs' expert in geographic information systems ("GIS") and map-making. Mr. Pflugh presented GIS data that showed that present and pending surface

mining permit operations and valley fills conservatively cover the following percentages of streams in these watersheds:

Watershed	% of total streams covered by valley fill permits	% first order streams covered by valley fill permits
Upper Guyandotte	7.4	9.5
Dingess Run	19.9	19.5
Coal River	12.0	14.5
Laurel Creek	28.0	37.3
Upper Kanawha	7.9	10.2
Cabin Creek–Headwaters	22.9	32.1

Expert Report of Douglas P. Pflugh, May 16, 2006, Summary, p. 2. The Corps reviewed this data and found it to be "very reliable." Mullins, Dr. Tr. 3:198. Dr. Wallace testified at trial that impacts of this magnitude were "astounding," a "danger signal," and meant lost headwater stream functions in these areas. Dr. Tr. 2:29-30.

The Corps considered only the cumulative impacts in the watershed where the fills are located, but articulated no basis for its conclusions that stream losses of this magnitude are insignificant. Mr. Pflugh showed that the surface mining activities permitted by the Corps amount to significant percentages in several watersheds. For example, he testified that surface mine permits cover 29% of the Laurel Creek watershed (the location of the Black Castle and Laxare East Mines) and that 18% of the headwater streams in that watershed are covered by mining permits. Dr. Tr. 1:54-56. Dr. Palmer testified that destroying 29% of a watershed would be highly detrimental to the ability to restore streams in that watershed. Dr. Tr. 2:128 -131 (effect of destroying this amount of watershed on source populations and ability to restore is huge). Dr. Palmer similarly testified that a loss of 29% of the watershed and 18% of the first order streams in a watershed were "incredibly significant." Dr. Tr. 2:129. Dr. Palmer further

stated that there is evidence showing that, generally, impacts start showing up once you have cleared 10 to 12% of a given watershed. Dr. Tr. 2:208-209.

Dr. Palmer also testified that there is a direct relationship between the amount of land disturbed in a watershed and the amount of biodiversity in that watershed. Specifically, she testified that "biodiversity decreases linearly with the amount of land disturbance" and that "for every percent of land that's disturbed, you get… a fixed amount of loss of biodiversity." Dr. Tr. 6:94-95. In addition, she stated that it would be important to know what percentage of the watershed is disturbed in order to understand the percentage decrease in biodiversity. *Id*.

II. The Corps Permit Process

The Corps presented two fact witnesses, Dr. Mark Sudol and Ms. Ginger Mullins, who testified concerning the Corps' regulatory process under the Clean Water Act and also outlined the approach taken by the Corps in determining to issue the permits challenged here.

According to Ms. Mullins, applications for § 404 permits are filed by the coal companies usually following some period of negotiation with the Corps. Dr. Tr. 3:163-64. Dr. Sudol testified that the Corps generally relies upon the data and information provided by the coal companies, and does not conduct an independent analysis of that information. Dr. Tr. 3:55.

Dr. Sudol explained that the Corps endeavors to comply with section 404 and the section 404(b)(1) guidelines by a process that is governed by series of Corps guidance documents issued since 1990. Each of these guidance documents state that the Corps should use a functional assessment of the affected aquatic habitat, but the Corps does not do so and has not yet begun developing an functional assessment method for the region that is subject to the jurisdiction of the Huntington District. Dr. Tr. 1:47-53.

Dr. Sudol and Ms. Mullins testified that the Huntington District relies on a "one to one" replacement method when designing a mitigation plan to offset the destruction of streams that

result from the issuance of their section 404 permits. Sudol Testimony, Dr. Tr. 1:53-54; Mullins Testimony, Dr. Tr. 4:202.

Dr. Sudol and Ms. Mullins also testified that the Corps relies upon the "best professional judgment" of the Huntington District staff in order to decide whether a proposed mitigation plan will be successful in reducing impacts to insignificance and ensuring that there will be no unacceptable adverse effects upon the aquatic environment as a result of those permits. Sudol Testimony Dr. Tr. 3:55-57; Mullins Testimony, Dr. Tr. 4:239. According to Dr. Sudol:

> Best professional judgment of functional assessment is you go out there as a trained biologist, bachelors, masters, with on-the-job training, determine what you believe with your view, without measuring variables, without measuring attributes at all, measuring function, what you would perceive the value function of that wetland, that stream, is. Then you evaluate the mitigation proposal by the applicant using that best professional judgment to determine if you believe in your role as a regulator does it meet the requirements, in addition if you impact a thousand feet of stream, there's a requirement to either restore or create a thousand feet of stream in -- on a general basis. But in terms of each specific project, there's an ability to enhance or preserve or do other mitigation. And the program basis you restore one-to-one.
>
> Sudol Testimony, Dr. Tr. 3:56-57.

IV. The Corps' Mitigation Does Not Follow Scientific Principles of Stream Restoration

Plaintiffs' expert on stream restoration, Dr. Margaret Palmer, testified based on her extensive experience with numerous projects around the country, regarding the fundamental steps necessary to restore streams:

> You -- first you want to determine why it is you need to restore a system, which involves monitoring a site that is degraded and determining what its current conditions are with respect to structure and function. And then you want to identify what it is that is the problem with that stream so that the design you come up with to try and fix the stream addresses what the problems are. And then you implement the design, and then you follow it up with more monitoring of structure and function to make sure that you accomplished the goals that you set out to begin with.

Dr. Tr. 2:125, *see also id*. at 144-145, 148. Dr. Palmer noted that "it's been at least 15 years ago that we started seeing the advent of measuring functions. And now it's quite easy…. it's not a

difficult thing to do…. it's not expensive." Dr. Tr. 2:138 – 141; Dr. Tr. 6:84, 92-94. The testimony and evidence at trial showed that the Corps failed at each of these steps.

A. The Corps Failed to Measure Effects on Stream Ecosystem Function

To decide whether discharges will cause or contribute to significant degradation of the affected streams, the § 404(b)(1) Guidelines require the Corps to determine "the nature and degree of effect that the proposed discharge will have, both individually and cumulatively, on the **structure and function** of the aquatic ecosystem and organisms." 40 C.F.R. § 230.11(e) (emphasis added).

Dr. Palmer testified that the Corps failed at the first step of its proposed mitigation plan because it did not adequately measure stream structure, and completely failed to measure stream functions – both in headwater streams that will be destroyed and in streams that will be restored, created, or enhanced as part of the agency's proposed mitigation. For example, Dr. Palmer testified that:

1. The Corps did not measure structure adequately because it used a rapid bioassessment protocol that looks only at habitat. She testified that this protocol is only a rough indicator of structure, and is rather subjective. Dr. Tr. 6:75-79.

2. There is no indication in the Corps' Compensatory Mitigation Plans that "the most fundamental things that need to be determined to properly mitigate have been done" such as "measuring all of the structural and functional ecological aspects that will be destroyed by the fills"). Dr. Tr. 6:72-74.

3. Despite using the word "function" throughout the Corps' documents, "there are no measures of function anywhere. . . The goal [of the mitigation] was explicitly stated that [it was] to replace functions that are lost, and yet the functions are not measured." Dr. Tr. 6:82.

4. Dr. Palmer testified that the Corps failed to measure the important function of ground water exchange, which is essential to water purification. Dr. Tr. 6:106 – 107.

5. Dr. Palmer noted that the Corps had measured structure and treated it as a surrogate for functions, but testified that measuring structure does not tell you much about functions. Dr. Tr. 6:95-96. For example, she testified that you cannot ascertain functions simply by looking at habitat or species of bugs. *Id*. at 96.

6. Dr. Palmer also testified that some stream functions – such as water purification – depend on microbes, not bugs; so measuring bugs tells you nothing about those kinds of functions. Dr. Tr. 6:102-103.

7. Dr. Palmer testified that it is not possible to get an idea of function merely by measuring a structural component such as a type of macroinvertebrate known as a "shredder." Instead, it is necessary to measure the production of shredders in order to determine whether decomposition is going on. Dr. Tr. 2:190. Production and decomposition are functions. *Id*. 135

8. Dr. Palmer testified that nothing in the Corps reports measures or tests its approach to stream creation. Dr. Tr. 2:204-205

The Corps has no specific guidelines for stream assessment on a functional or structural basis. Sudol Testimony, Dr. Tr. 3:51-52. Both Dr. Sudol and Ms. Mullins testified that the Huntington District does not perform functional assessments. Sudol Testimony, Dr. Tr. 9; Mullins Testimony, Dr. Tr. 3:187, 4:191. Instead, "they fall back on the one-to-one replacement either for acres of wetlands or linear feet for streams." *Id*. Mr. Sudol said it would take one to three years before there is a functional assessment method for West Virginia. Dr. Tr. 3:48. Since 1990, the Corps has devoted "zero" funds to developing such a method. Dr. Tr. 3:61, despite wide recognition of mountaintop removal and valley fills' significance to the environment.

In the absence of a functional assessment, the Corps uses an assessment based on "best professional judgment." According to this methodology, the Corps assesses stream "function" from a regulatory, not a scientific or ecological, perspective. *Id*. 3:152-53.

The Corps has also allowed some permit applicants to use a SHU assessment methodology as a tool to determine how much mitigation is required to achieve at least a one-to-one stream loss/stream mitigation ratio. Sudol Testimony, Dr. Tr. 3:145; Mullins Testimony, Dr. Tr. 3:188; 4-191. The SHU method was developed by two coal industry consultants and a coal industry engineer. Kirk Testimony, Dr. Tr. 5:44-45. The SHU was not meant to be scientific, and only measures aquatic habitat, not benthic macroinvertebrates, water chemistry, or fish. *Id*. at 48, 63-64.

Dr. Wallace testified that the SHU system has no scientific basis, and if one of his graduate students had proposed such a concept, he would not have received an advanced college degree. Dr. Tr. 2:64. In his testimony, Dr. Sudol stated that the SHU method is not an approved functional assessment method. Dr. Tr. 3:13. The Corps has also rejected it as a functional assessment method or as the standard for mitigation in the Huntington District. Mullins Testimony, Dr. Tr. 4:198-202. The Corps' regulatory chief has admitted that the SHU method "is not scientifically defensible." Sudol Testimony, Tr. 3:74.

B. The Corps Failed to Require Mitigation That Replaces Lost Aquatic Resources

The evidence shows that the Corps also failed to ensure that the mitigation will be successful in offsetting losses caused by destruction of headwater streams. The Corps intends to mitigate for the destruction of headwater streams by "creating" or "enhancing" other streams. For example, Mr. Kirk stated that stream enhancements "are definitely providing habitat improvements downstream" and that "[i]n conjunction with those improvements, as well as, say,

the stream creation that is also being proposed on some of these projects, I think we're doing our best to offset losses caused by, you know, the valley fills." Dr. Tr. 5:82.

However, Dr. Sudol testified that he did know of a single instance of successful stream creation east of the Mississippi River. Dr. Tr. 3:41, 125. The Corps' regulatory chief in its Huntington District similarly did not know of a single successful stream creation project in Appalachia. Dr. Tr. 4:214.

Dr. Palmer further explained that the mitigation plans for the permits in this case will not achieve their stated goal of replacing lost aquatic resource, for numerous reasons, for example:

1. Merely restoring lower reach streams covered by the sediment ponds located at the base of the valley fills does not restore the functions of a headwater stream. Dr. Tr. 2:147-148.

2. It is not possible to replace unique functions of headwater streams by "enhancing" perennial streams with boulders and wood. Dr. Tr. 2:148-149.

3. One of the central assumptions by the Corps – that it is possible to restore stream functions by enhancing habitat – is not scientifically supported. Dr. Palmer's testimony included the following points:

(a) There is no scientific proof that function follows structure. Dr. Tr. 2:163-165.

(b) Habitat is necessary but not sufficient; it is possible for a stream to have habitat but not to have functions. Dr. Tr. 2:200-201, 214-216.

(c) The ecosystem must have species available to colonize a restored area; they need to be able to reproduce; and only after the first two requirements are established, should one look at habitat. Thus, she analogized creating good habitat to building a good house but ignoring possible radon problems. Dr. Tr. 6:139 – 141.

(d) Merely providing habitat does not ensure success – either at getting functions back or even getting biota back. Dr. Tr. 2:181-182.

(e) Nothing in the scientific literature supports the assumption that adding habitat leads to an increase in diversity or to a more healthy community. Dr. Tr. 6:109-110.

(f) The stream enhancements (such as J hooks) will last for less than 20 years, while the headwater streams will be destroyed permanently. Dr. Tr. 6:110-111.

4. The Corps has wrongly assumed its plan will work by relying on an unproven theory that there is species redundancy in streams. Dr. Tr. 6:99 – 102 (the rivet theory of species redundancy has never been proven in stream ecosystems); Dr. Tr. 6:163-164 (the "redundancy theory"- the notion that caddis flies can simply replace mayflies, *e.g.*, is disproved by current peer-reviewed science).

5. The Corps "didn't even do the most basic steps one would take to think about how you might go about creating a stream." Dr. Tr. 2:150-151. She found the drawing offered by Dr. Sudol of an (as yet unsuccessful) attempt to create a stream down the face of a valley fill to be "pretty scary." Dr. Tr. 6:167.

6. The stream creation plan at the Camp Branch mine will not be adequate for several reasons, including the failure of the Corps to measure groundwater and surface water interactions, Dr. Tr. 2:164-167; and the apparent intention to line one of the affected ditches with grout – thereby preventing such exchanges. Dr. Tr. 2:193.

C. The Corps Failed to Require Adequate Monitoring of the Mitigation Effort

Dr. Palmer testified that the Corps failed to provide for monitoring that assesses stream functions. Dr. Tr. 2:180-182. Moreover, Dr. Palmer pointed out that one of the key indicators of success of the mitigation plan – set out by the Corps as a "performance indicator" in its documents, is an arbitrary and scientifically unsound methodology known as the "Stream Habitat

Unit" methodology. Dr. Tr. 2:165 – 171 (the SHU concept is arbitrary and places the wrong weight on ephemeral and perennial streams). Therefore, the Corps flunked the third part of the requirement for establishing a successful mitigation plan.

STATUTES AND REGULATIONS

Following is an overview of the statutory and regulatory provisions that govern this case. Plaintiffs will cite additional specific provisions within their Argument, *infra*.

I. NEPA and the CEQ Guidelines

NEPA requires federal agencies to prepare a detailed environmental impact statement ("EIS") analyzing the environmental impacts of "every major Federal action significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). "Affecting means will or may have an effect on." 40 C.F.R. § 1508.3 The Council on Environmental Quality ("CEQ") has promulgated regulations implementing NEPA that are binding on all federal agencies, including the Corps. 40 C.F.R. § 1500.3; *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 354 (1989). To determine whether to prepare an EIS in connection with an individual permit under CWA section 404, the Corps prepares an Environmental Assessment ("EA"). 40 C.F.R. §§ 1501.3–1501.4; 33 C.F.R. § 230.7. The CEQ Guidelines require an EA to "[b]riefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact." 40 C.F.R. § 1508.9(a)(1). If an EIS is prepared, it must include an analysis of direct and indirect environmental "effects" of the proposed action, including "cumulative" impacts and "cumulative actions." *Id*. §§ 1502.16, 1508.8, 1508.25(a)(2). "Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment." *Id*. § 1508.27(b)(7). An EIS also must "study, develop, and describe appropriate alternatives" to the proposed action. 42 U.S.C. § 4332(2)(E). This requirement to analyze alternatives in detail is central to an EIS; the CEQ Guidelines describe

alternatives analysis as "the heart" of the EIS and emphasize that the agency must "rigorously explore and objectively evaluate all reasonable alternatives." 40 C.F.R. § 1502.14(a).

II. Clean Water Act § 404 and the § 404(b)(1) Guidelines

Section 404 of the Clean Water Act (CWA) authorizes the Corps to issue permits for the discharge of dredged or fill material into specified disposal sites only in compliance with regulations implementing § 404. 33 U.S.C. § 1344(a). These regulations (the "§ 404(b)(1) Guidelines," set forth at 40 C.F.R. § 230.1 *et seq.*), are binding on the Corps.[4] Under the Guidelines, the Corps must, *inter alia*, "**[d]etermine the nature and degree of effect** that the proposed discharge will have, both individually and cumulatively, **on the structure and function of the aquatic ecosystem and organisms**," 40 C.F.R. § 230.11(e) *et al*.[5] A memorandum of agreement between EPA and the Corps provides that "[i]n determining compensatory mitigation, the **functional values lost by the resource to be impacted must be considered."** Corps Trial Ex. 11, EPA/Corps Memorandum of Agrmt. (Feb. 6, 1990), Section II (emphasis added). On May 7, 2004, the Corps issued guidance on "Mitigation for Impacts to Aquatic Resources from Surface Coal Mining." Corps Ex. 16. That document states:

> The Clean Water Act, and the Corps implementing regulations and policies, requires that compensatory mitigation projects ***replace aquatic functions*** lost as a result of authorized activities. Ideally, stream functions lost as a result of permanent fills are replaced by compensatory mitigation projects that provide equivalent or similar stream functions within the same watershed.

Id. at 3 (emphasis added).

[4] CWA § 404(b) mandates that "each disposal site shall be specified . . . through the application of guidelines developed by [EPA], in conjunction with the [Corps]…." These Guidelines were adopted and made binding on the Corps more than twenty-five years ago. *See* 40 C.F.R. § 230.11 (citing 45 Fed. Reg. 85344 (Dec. 24, 1980)). Thus, the § 404(b)(1) Guidelines are binding upon the Corps.

[5] *See also* 40 C.F.R. § 230.11(g) (describing the Corps' duty to analyze cumulative impacts on the aquatic ecosystem) and § 230.44(h) (secondary impacts on the aquatic ecosystem).

The Section 404(b)(1) Guidelines set forth specific restrictions on the Corps' authority to permit discharges into U.S. waters. *See Utahns for Better Transp. v. U.S. Dep't of Transp.*, 305 F. 3d 1152, 1187 (10th Cir. 2002); *B&B Partnership v. U.S.*, 1997 WL 787145 at *6 (4th Cir. 1997) (approving Corps' denial of § 404 permit where "the Corps determined that elimination of the headwater stream would add to the cumulative negative impact on environmental resources caused by the loss of other headwaters in the area"). A "fundamental precept" of the Guidelines is that "fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern." 40 C.F.R. § 230.1(c).

Section 230.10 of the Guidelines provides that:

> (c) **No discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States**. Findings of significant degradation related to the proposed discharge shall be based upon appropriate factual determinations, evaluations, and tests required by subparts B and G, after consideration of subparts C through F, with special emphasis on the persistence and permanence of the effects outlined in those subparts. Under these Guidelines, effects contributing to significant degradation considered individually or collectively, include:
>
> (1) Significantly adverse effects of the discharge of pollutants on human health or welfare, including but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites.
>
> (2) Significantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, and spread of pollutants or their byproducts outside of the disposal site through biological, physical, and chemical processes;
>
> (3) Significantly adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy; or
>
> (4) Significantly adverse effects of discharge of pollutants on recreational, aesthetic, and economic values.

> (d) Except as provided under section 404(b)(2), no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem. Subpart H identifies such possible steps.

ARGUMENT

I. STANDARD OF JUDICIAL REVIEW

A. Administrative Procedure Act

Under the Administrative Procedure Act ("APA"), courts set aside agency actions that are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(A)(2). Agency actions are arbitrary and capricious if the agency has not "examine[d] the relevant data and articulate[d] a satisfactory explanation for those actions, including a 'rational connection between the facts found and the choices made.'" *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto Ins. Co.*, 463 U.S. 29, 43 (1983) (*quoting Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962). Additionally, courts will set actions aside as arbitrary and capricious if the agency "relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Id.*

In determining whether agency actions violate the APA, the court engages in a "searching and careful" review of the facts and decides "whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment." *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 416 (1971). Courts grant a degree of deference to agency decisions that are based on technical or scientific considerations. *Baltimore Gas & Electric Co. v. NRDC*, 462 U.S. 87, 103 (1983). However, courts do not uniformly defer to agency scientific judgments: "we do not hear cases merely to rubber stamp agency [science-

based] actions. To play that role would be 'tantamount to abdicating the judiciary's responsibility under the Administrative Procedure Act.'" *NRDC. v. Daley*, 209 F. 3d 747, 755 (D.C. Cir. 2005) (*quoting A.L. Pharma, Inc. v. Shalala*, 62 F. 3d 1484, 1491 (D.C. Cir. 1995).

B. NEPA

An EIS must be prepared for any major federal action that "may" have a significant effect the environment. In reviewing the agency's decision to issue a FONSI rather than perform an EIS, the Court's inquiry is twofold:

First, the Court "must determine whether the agency took a 'hard look' at the project's effects." *Wilds v. South Carolina Dept. of Transp.*, 2001 WL 492299, 6 (4th Cir. 2001). "[A]n agency takes a sufficient 'hard look' when it obtains opinions from its own experts, obtains opinions from experts outside the agency, **gives careful scientific scrutiny** and responds to all legitimate concerns that are raised." *Id*. (emphasis added, internal quotes omitted). A "hard look" requires a "thorough investigation into the environmental impacts of an agency's action and a candid acknowledgment of the risks that those impacts entail." *Nat'l Audubon Soc'y v. Dept. of Navy*, 422 F.3d 174, 185 (4th Cir. 2005).

Second, the Court determines whether, in refusing to prepare an EIS, "the decision was arbitrary or capricious." *Wilds*, 2001 WL 492299 at 5. *See Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Auto Ins.*, 463 U.S. 29, 43 (1983) (discussed *supra*). "An agency's refusal to prepare an [EIS] is arbitrary and capricious if its action *might* have a significant environmental impact." *State of N. Carolina. v. FAA*, 957 F.2d 1125, 1131 (4th Cir. 1992) (emphasis added).

While a court in reviewing compliance with NEPA will not second-guess the agency's judgment, "the court must undertake a 'thorough, probing, in depth review' and a 'searching and careful' inquiry into the record." *See Dubois v. U.S. Dept. of Ag.*, 102 F.3d 1273, 1285 (1st Cir.

1996) (citing *Overton Park*, 401 U.S. at 415-16). As the Fourth Circuit has stated, "[i]n conducting our NEPA inquiry, we must 'make a searching and careful inquiry into the facts and review whether the decision ... was based on consideration of the relevant factors and whether there has been a clear error of judgment.' " *Audubon v. Navy*, 422 F.3d at 185, citing *Hodges v. Abraham*, 300 F.3d 432 at 445 (4th Cir. 2002); *City of Alexandria v. Fed. Hwy. Admin.*, 756 F.2d 1014, 1017 (4th Cir. 1985); and *Marsh v. Oregon Nat. Res. Council*, 490 U.S. at 378.

In determining whether the agency took a "hard look" at the effects of the proposed activity, the Court's review is both case-specific and contextual. *Audubon v. Navy*, at 422 F.3d at 186. The Court looks at the "totality of the circumstances" and conducts a "searching and careful inquiry into the facts and the agency's consideration of relevant factors." *Id*. at 186 (internal quotes omitted). While the court will not "flyspeck" trivial inadequacies, "a totality of the circumstances approach means that a court must view deficiencies in one portion of an EIS in light of how they affect the entire analysis." *Id*. Accordingly, "[a]n agency may not, for example, paper over one inadequate mode of analysis by referencing another with shortcomings of its own." *Id*.[6] "A reviewing court must therefore examine all of the various components of an agency's environmental analysis in order to determine, on the whole, whether the agency has conducted the required 'hard look'." *Id*. at 186. The U.S. Supreme Court stated in *Marsh v. Oregon Nat. Res. Council*, 490 U.S. 360, 378 (1989) that only by "carefully reviewing the record and satisfying [itself] that the agency has made a reasoned decision" can the court "ensure that agency decisions are founded on a reasoned evaluation of the relevant factors." *Id*. at 378. Thus,

[6] In *Nat'l Audubon*, the 4th Circuit invalidated an EIS where it found that deficiencies in the analysis of the direct effects "bleed into the arena of cumulative impacts as well." *Id*. at 198. Additionally, the court found that deficiencies in the analysis of impacts invalidated the agency's approval of the mitigation plan, stating: "The sufficiency of the mitigation measures proffered in the FEIS are necessarily dependent on an adequate assessment of environmental impact. For this reason, the FEIS also fails to sufficiently address mitigation." *Id*. at 200.

the Corps is required, not only to follow its prescribed procedure for analyzing § 404 individual permits, but must comply with the prescribed *substantive* requirements by conducting a "reasoned evaluation of relevant factors." *Id*. (emphasis added).

C. Clean Water Act

The Clean Water Act "provides a more intrusive power of review" of a § 404 permit than does NEPA. *Sierra Club v. U.S. Army Corps of Engineers*, 772 F.2d 1043, 1051 (2nd Cir. 1985). This more intrusive power of review derives from the "purpose of the CWA to prohibit agency action whenever certain environmental impact thresholds are met." *Id*. In particular, 40 C.F.R. § 230.10(c) states that the Corps cannot permit fills that will "cause or contribute to significant degradation of the waters of the United States." The Corps' regulations state that "a permit **will be denied** if the discharge that would be authorized by such a permit would not comply with the 404(b)(1) guidelines." 33 C.F.R. § 323.6 (emphasis added).[7] Consequently, in reviewing the agency's decision to grant a § 404 permit,

> Instead of simply insisting procedurally that the agency weigh environmental concerns, the Clean Water Act specifically prohibits an agency from sanctioning a project that it finds will have a significant adverse impact on the marine environment. **Therefore, when an agency approves a project that the record before a reviewing court reveals will have a significant adverse impact on marine wildlife, the agency determination must be reversed**.

Id. (emphasis added). Accordingly, in judicial review under the CWA, the Court will look beyond the agency's compliance with the procedural requirements of CWA, to determine whether the record reveals that the project will have a significant adverse impact. *See id.* If so, then the CWA requires that the decision be reversed. *Id.*

[7] *See also B & B Partnership v. United States*, 1997 WL 787145 at *5 (4th Cir. 1997) ("If the proposal does not satisfy the guidelines or if it is judged not to be in the public interest, the Corps must deny the permit"); *James City County, Virginia v. EPA*, 12 F. 3d 1330, 1333 (4th Cir. 1993) (noting that no permit shall issue if the discharge would result in significant degradation to waters of the U.S.).

II. THE CORPS VIOLATED NEPA AND THE CWA BY IGNORING EVIDENCE THAT THE PERMITS WILL CAUSE SIGNIFICANT ADVERSE EFFECTS

As discussed above, both NEPA and the CWA require the Corps to conduct a careful scientific study of the effects of its § 404 permits. Determining the environmental effects of the project is critical, not merely as a way of complying with procedural requirements under NEPA, but because only with a full understanding of the effects of the project can the agency know what mitigation, if any, is sufficient to eliminate such effects. *See* Palmer Testimony, Dr. Tr. 2:125.[8]

In this case, the Corps recognized that the projects would cause significant effects on the environment. *See, e.g.* Black Castle Reissued CDD at 3 (the valley fills will permanently bury and destroy 2.3 miles of intermittent and ephemeral streams); Republic No. 2 Reiss. CDD at 2 (1.87 miles of stream permanently buried); Camp Branch Reiss. CDD (2.85 miles of stream permanently buried); Republic No. 1 Reiss. CDD at 4 (1.98 miles permanently buried); Laxare East Reiss. CDD at 4 (4.71 miles permanently buried). However, the Corps in its EAs failed to adequately study and understand the ecological effects of its permits as required by NEPA. Likewise, the Corps failed to determine how and to what extent its permits will cause significant degradation of waters of the U.S., as required under the § 404(b)(1) Guidelines. Instead, the Corps assumed that mitigation would "offset" any impacts. *See* Dr. Tr. 4:239 (Mullins testimony, explaining that each of the permits "made a determination of the finding of no significant impact based on the consideration [of] the mitigation").[9] For the reasons discussed

[8] Explaining the key principles of stream restoration, Dr. Palmer stated: "You -- first you want to determine why it is you need to restore a system, which involves monitoring a site that is degraded and determining what its current conditions are with respect to structure and function. And then you want to identify what it is that is the problem with that stream so that the design you come up with to try and fix the stream addresses what the problems are."

[9] *See also* Reissued CDDs, *e.g*. Black Castle Mine Reiss. CDD at 21 (assuming that "impacts to normal water fluctuations would be offset by successful implementation of the applicant's CMP") and 30 (*verbatim*, regarding benthic organisms); *see also id*. at 42 (stating that "the aquatic ecosystem structure and function would change as the result of the proposed valley fills and associated sediment construction," but assuming that the "applicant's

below, the evidence does not support this assumption. Further, the failure to adequately study the effects of the permits doomed the Corps' assumptions that the mitigation plans would offset impacts.

A. The Corps' Failure to Evaluate Stream Functions Violates the CWA and NEPA.

The CWA § 404(b)(1) Guidelines require the Corps to study the effect of its permits "both individually and cumulatively, on the **structure and function** of the aquatic ecosystem and organisms." 40 C.F.R. § 230.11(e) (emphasis added). Nonetheless, the Corps failed to analyze the effects of its permits on functions in headwater streams that will be covered by the permits. This failure violated both the CWA and NEPA, and was arbitrary and capricious, for the reasons discussed below.

1. The Corps' approach does not satisfy its duty to assess stream functions as required under the § 404(b)(1) Guidelines

The Corps concedes that it failed to analyze how stream functions would be affected by the § 404 permits in this case. *See* Testimony of Dr. Mark Sudol, Chief, Corps Reg. Branch, Dr. Tr. 3:9. A series of Corps guidance documents issued since 1990 all state that the Corps should use functional assessment, but the Corps does not do so and has not even begun developing an functional assessment method for the region. Sudol Tr. 47-53. However, the Corps argues that this failure does not violate its legal requirements, claiming that "because they [the Huntington District] do not have a Corps approved functional assessment, they fall back on a minimum of one-to-one" replacement of linear feet of stream. *id*. at 13. *See also* Testimony of Ginger Mullins, Dr. Tr. 4:206 (stating that the determination whether aquatic resources are replaced is based on "one-to-one replacement" of linear feet).

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mitigation plan would be expected to result in the replacement of the appropriate type and quantity of aquatic functions lost due to project impacts").

"One-to-one" means mitigation of "impacts to the aquatic resources are on a one-to-one basis" Sudol Testimony, Dr. Tr. 4:54. Thus, the Corps cannot obviate the requirement that it determine the loss of "aquatic resources" caused by fills and balancing those against the putative creation of aquatic resources by mitigation. In other words, the Corps must have a scientifically valid means of determining the value of aquatic resources even under its one-to-one policy.

To compound the Corps' problems, unlike the Guidelines which clearly require a functional analysis, the guidance documents that it relies on to justify its one to one approach, were not promulgated. The guidance documents, therefore, cannot exceed the scope of the promulgated Guidelines which they purport to interpret.

The Corps' approach, then, is insufficient because it ignores the *legal requirement* in § 404(b)(1) Guidelines that the Corps assess effects on stream functions. *See* 40 C.F.R. § 230.11(e) (the Corps must "[d]etermine the nature and degree of effect that the proposed discharge will have, both individually and cumulatively, on the structure and function of the aquatic ecosystem and organisms"). Indeed, a 1990 Memorandum of Understanding between EPA and the Corps states:

> **Functional values should be assessed** by applying aquatic site assessment techniques generally recognized by experts in the field and/or the best professional judgment of federal and state agency representatives, provided such assessments fully consider ecological functions included in the Guidelines.

(Corps Trial Ex. 11 at sec. III.A.).

Instead of assessing effects on stream functions, the Corps reportedly relies only on the "best professional judgment" of its program managers to determine effects upon stream ecosystem function. *See* Dr. Tr. 3:56 (Testimony of Dr. Sudol, stating that staff in the Huntington District use "best professional judgment" to determine "what is the value, the function of the habitat, and then [whether] the mitigation appears to replace it"). However, the

testimony revealed that there is no requirement for staff to "fully consider ecological functions" in their exercise of "best professional judgment." *Id*. at 56-57. According to Dr. Sudol:

> Best professional judgment of functional assessment is you go out there as a trained biologist, bachelors, masters, with on-the-job training, determine what you believe with your view, without measuring variables, without measuring attributes at all, measuring function, what you would perceive the value function of that wetland, that stream, is.

Simply "view[ing], without measuring variables, without measuring attributes at all," and relying on "what you would perceive the value" of functions to be does not comply with the Corps' legal duty to determine the effect of its permits upon the "function of the aquatic ecosystem." 40 C.F.R. § 230.11(e). The Corps' procedures are completely without standards or measures of success. Even under the 1990 memorandum of understanding cited by the agency at trial, functions should be assessed "by applying aquatic site assessment techniques generally recognized by experts in the field," and any exercise of "best professional judgment" would be required – at a minimum – to "fully consider ecological functions included in the Guidelines."

Further, this approach is illegal because "best professional judgment," as has been applied by the Corps, is subjective and – as this case has shown – leaves nothing in the administrative record that can be subject to judicial review.

Moreover, the Corps' approach is not only legally insufficient, but there is no indication that has any legitimate *scientific* basis. The Corps provides no evidence that its staff are capable of scientifically assessing stream functions by means of "view[ing], without measuring variables, without measuring attributes at all," based on "what you would perceive." Sudol testimony, Dr. Tr. 3:56. Further, the testimony confirmed that the "best professional judgment" applied to these permit decisions involved no consideration of stream functions, but instead relied on measures of *structure* such as "sampling of benthic macroinvertebrates," habitat assessments, and chemical

sampling. *See e.g.*, Reiss. Black Castle CDD at 100-102 (responding to plaintiffs' concern that no stream functions have been measured). *See also* Dr. Tr. 4:194 (Mullins testimony, conceding that coal company consultants performed only the habitat portion of EPA's rapid bioassessment protocol).

In short, neither "one-to-one replacement of linear feet" nor "best professional judgment" suffice in place of the assessment of stream functions the Corps failed to conduct.

2. The Corps ignored available measures of stream function

In comments to the Corps by two eminent stream biologists, Plaintiffs alerted the Corps that available measures of stream function should have been applied to the permits in this case. *See e.g.* Black Castle Mine CDD at 100 (acknowledging comment by Dr. Wallace that stream functions should be measured). The Corps implied that such measures would be too costly. *Id*. However, testimony by Plaintiffs' experts at trial reveal that the Corps ignored cost effective means of assessing function that are presently available and widely accepted in the scientific community. *See* Testimony of Dr. Margaret Palmer, Dr. Tr. 2:138-142. Moreover, the Corps could offer no rational explanation why the Huntington District failed to use functional assessments despite their use in Kentucky Corps offices. *See id*. Dr. Tr. 4:211.

Ignoring available, widely-accepted functional measures violated the Corps' requirement under the § 404(b)(1) Guidelines to determine the effect of its permits on stream function. It also contravenes the 1990 memorandum of agreement relied upon by the Corps, *supra*, which states that "[f]unctional values should be assessed by applying aquatic site assessment techniques generally recognized by experts in the field." Finally, because it ignored available means for assessing stream functions, thereby failing to assess an important aspect of the effects of the permits, the Corps' decision to issue each of the permits was arbitrary and capricious. *See Motor*

Vehicle Mfrs. Ass'n, 463 U.S. at 43 (agency action is arbitrary and capricious if the agency "entirely failed to consider an important aspect of the problem").

B. The Corps Failed to Evaluate the Effects of Its Permits on Aquatic Ecosystem Diversity, Productivity, and Stability.

The § 404(b)(1) Guidelines require the Corps to consider the effects of the projects on "aquatic ecosystem diversity, productivity, and stability." 40 C.F.R. § 230.10(c)(3). However, there is no evidence that the Corps actually considered these factors.

1. Degradation of ecosystem diversity is significant.

Headwater streams can be responsible for 90 percent of the biodiversity in an entire watershed. Palmer Testimony, Dr. Tr. 2:170-71. Valley fills reduce biodiversity by favoring pollutant-tolerant macroinvertebrate species over pollution-intolerant species. In fact, Intervenors' water quality expert admitted that valley fills cause a dramatic reduction in mayfly taxa in downstream waters, with a shift to more pollution-tolerant taxa. Kirk Testimony, Dr. Tr.. 5:84-85. Dr. Cherry, Intervenors' expert in aquatic ecotoxicology from Virginia Tech (Dr. Tr. 5:107), testified about his research involving water discharges from valley fills in southern West Virginia. (Dr. Tr. 5:111-14). His study found a shift in the benthic community to a more tolerant type. *Id*. at 116, 121, 162. Dr. Cherry agreed that the created streams would not be the functional equivalent of the streams buried by valley fills. *Id*. at 5:141-42. Indeed, he rated the streams below valley fills as "terrible" with scores well below the score for the reference stream. *Id*. at 5:148. Those streams showed "significant stress." *Id*. at 5:169. Dr. Wallace testified that there is a well-established correlation between conductivity levels and the loss of sensitive benthic organisms. Dr. Tr. 6:27-36. He stated that high conductivity is contributing to major problems with benthic invertebrates, *id*, and that some of the worst conditions are found below fill sites. *Id*.

The loss of biodiversity from this loss of benthic taxa is significant. Wallace Testimony, Dr. Tr. 6:64. Other organisms cannot make up for this loss of biodiversity because they serve different functions. Palmer Testimony, Dr. Tr. 6:99-102. Different species are not necessarily interchangeable. *Id*. The functions of filled first and second-order headwater streams cannot be replaced in the larger order streams downstream. Wallace Testimony, Dr. Tr. 6:38. Those functions include nutrient retention, water purification, and energy production functions. *Id*. at 40-47; Palmer Testimony, Dr. Tr. 6:97-99.

The only significant vertebrate animal in headwater streams is the salamander. Wallace Testimony, Dr. Tr. 2:248. The Central and Southern Appalachians contain the greatest abundance of species of salamanders in the world. Wallace Testimony, Dr. Tr. 6: 36. Salamanders are being buried by valley fills and not replaced downstream. *Id*. at 36-38; Cherry testimony, Dr. Tr. 5:162-63. Forest loss associated with mountaintop mining and valley fills has the potential to adversely impact over 1.2 billion salamanders, or 3.4% of the entire four-state population in Appalachia. Mountaintop Removal/Valley Fill Programmatic EIS, App. I, pp. 92-93. The Corps' enhancement mitigation in perennial streams has no effect on these losses because the salamanders are concentrated in smaller first and second order streams, Dr. Tr. 1:298; and because the mitigation does nothing to prevent or offset forest loss. Remarkably, the Corps utterly failed to consider this loss of diversity in its decisions in this action.

2. Impacts of the § 404 Permits on Water Chemistry is Significant

Conductivity is generally five to nine times greater below valley fills than below unmined sites. Wallace Testimony, Tr. 31. Sulfates were 41 times greater; calcium, magnesium and hardnesss were 21 times greater; total dissolved solids were 16 times greater, and selenium was 7.8 times greater. *Id*. at 32. These chemical changes have a significant effect on the aquatic ecosystem. *Id*. Dr. Wallace called them a "witches' brew." Dr. Tr. 2:33. There is no support for

the position that mitigation reduces conductivity to normal levels. On the contrary, EPA found that "[t]he highest values are consistently at the Sediment Control Structure (MT-24) which is on a reclaimed MTM/VF mine." *Id*. at 45. Dr Wallace agreed with Dr. Cherry that something correlated with conductivity is stressing benthic communities and reducing ecological diversity below valley fills. *Id*. At 37. The Corps' failure to meaningfully consider the negative impacts of the valley fills at issue here on stream chemistry is fatal to its permit decisions.

3. The Corps failed to assess impacts on biodiversity

There is no evidence that the Corps actually considered these factors. For example, the Laxare decision document, in response to comments from Plaintiffs, asserted without analysis or supporting evidence:

> These four factors have been considered by the Corps both individually and cumulatively as part of the 404(b)(1) Guidelines evaluation incorporated into this CDD…. The proposed project would not be expected to significant[ly] affect aquatic life and ecosystem diversity, productivity and stability and other water dependent wildlife [sic].

This bare assertion with no explanation or apparent basis falls far short of the Corps' duty to explain the effects of its permits under both NEPA and CWA. This failure to address relevant factors in assessing the permits, particularly factors specified in the § 404(b)(1) Guidelines as potential significant impacts, was arbitrary and capricious.

C. The Corps' Failure to Evaluate the Effects of its Permits on Runoff and Risk of Flooding Violated NEPA and the CWA.

The Corps conducted no analysis of the effect of its permits on storm runoff and flooding risks. Instead, the Corps accepted uncritically the conclusions of the State, based on the "Surface Water Runoff Analyses" ("SWROA") conducted from three to five years ago to satisfy requirements of surface mining laws. *See* Dr. Tr. 4:212 (Ginger Mullins, stating "[t]he Corps accepts the SWROA but on the state's approval"). The Corps did so without conducting an

independent analysis, review of the relevant literature, or verification of the conclusions. *Id*. at 213 (agreeing that the Corps "accept[s] the state at its word without any independent verification of that"). In failing to consider runoff and flooding, the Corps ignored highly relevant scientific evidence regarding the effects of surface mines and valley fills.

1. The Corps's uncritical acceptance of a State agency's analysis was arbitrary and capricious and violates NEPA and the CWA

The Corps' regulations state that the agency should look at the effects of its permits upon "normal water fluctuations," including "flood fluctuations" as "potential impacts on physical and chemical characteristics of the aquatic ecosystem," and that these "should be considered in making the factual determinations and the findings of compliance or noncompliance" with §404(b)(1) Guidelines. 40 C.F.R. §§ 230.20 and 24. The valley fills and related land surface changes in this case will increase the risk of flooding. *See* Eshleman Testimony, Dr. Tr. 1:165-66 (stating that "the effects of multiple mines within a basin will be additive," and explaining that the greater proportion of the watershed that is disturbed by land use changes, "the greater the effect will be on runoff and flooding within those watersheds"). Thus, the Corps was required to conduct its own analysis of runoff and flooding.

The Corps argues that it has no legal duty to consider the direct or cumulative effects of its permits upon runoff and flooding risks because it relied on the West Virginia DEP's SWROA analysis of runoff. *See* U.S. Opp. to Mot. for Prelim. Inj. on Laxare East at 25 (Dkt. # 158). However, the Fourth Circuit Court of Appeals has stated that an agency does not satisfy NEPA "by simply relying on another agency's conclusions about a federal action's impact on the environment." *State of N. Carolina v. FAA,* 957 F.2d 1125, 1129-31 (4th Cir.1992). Moreover, the Corps has failed to provide any evidence that the analysis required of SMCRA applicants suffices to satisfy the Corps' own requirements under NEPA and CWA § 404.

Further, under CEQ's NEPA regulations, even if an agency adopts the environmental analysis of another agency it may do so only after reviewing the analysis and accepting responsibility for its scope and content, and issuing its own FONSI based on the independent analysis. *See id*. at 1130 (noting that the agency satisfied NEPA only by conducting its own independent review of the previous analysis, citing Guidance Regarding NEPA Regulations, 48 Fed. Reg. 34263, 34265-66 (1983)); *Anacostia Watershed Soc'y v. Babbitt*, 871 F. Supp. 475, 485 (D.D.C. 1994) (noting that an agency may adopt the analysis of another agency only under certain circumstances set forth in the CEQ Guidelines, and in doing so "the agency must independently review the environmental impact statement to ascertain that it is current and that it satisfies the agency's own NEPA procedures"). Here, the Corps conducted no such review.

2. The Corps' conclusion that there would be no cumulative impact on flooding and runoff was arbitrary and capricious

The Corps' conclusions regarding cumulative impacts on runoff violate NEPA. For several of the permits, the Corps conducted no cumulative analysis whatsoever of runoff. *See* Republic No. 2 Reiss. CDD at 19; Camp Branch Reiss. CDD at 66; Republic No. 1 Reiss. CDD at 30. For others, the Corps relied upon the mere existence of regulations limiting runoff and discharge. *See, e.g.* Black Castle Reiss. CDD at 59 ("As for cumulative impacts, the surface mining operation in the watershed must meet the [SMCRA] and WV mining regulations requirements regarding run-off and discharge…. Due to the regulations in place that govern and/or would govern this proposed project, and the other active operation in the local watershed, as previously defined, no unacceptable impacts on flood hazards would be expected to occur as a result of the proposed project"); Laxare Reiss. CDD at 60 (*verbatim*).

The Corps' reliance on the mere existence of "requirements regarding run-off and discharge" under SMCRA and State regulations as the basis for cumulative impacts analysis of

runoff violated NEPA. In *State of Idaho v. I.C.C.*, 35 F.3d 585, 595 (D.D. Cir. 1994), the court rejected a similar argument where "[i]nstead of taking its own hard look, the Commission deferred to the scrutiny of others by authorizing salvage subject to conditions that require [the regulated entity] Union Pacific to consult with various federal and state agencies about the specific environmental impacts that fall within their jurisdictions." The court noted that this kind of "attempt to rely entirely on the environmental judgments of other agencies [is] in fundamental conflict with the basic purpose of NEPA." *Id*. Because its reliance on the judgment of other agencies was the sole basis for the Corps' conclusion that there would be no cumulative impacts on runoff and flooding, its conclusion was arbitrary and capricious.

3. The Corps' conclusions that there would be no impact on runoff is based on unsupported assumptions

The SWROA models for the permits in this case involved numerous assumptions that the Corps never disclosed or analyzed.[10] Without a rational basis for the Corps' reliance on the SWROAs, including an explanation of the basis for the assumptions in the SWROA models, the Corps' reliance on the SWROAs was arbitrary and capricious. *Columbia Falls Aluminum Co. v. EPA*, 139 F.3d 914, 923 (D.C. Cir. 1998) (the agency "retains a duty to examine key assumptions as part of its affirmative burden of promulgating and explaining a non-arbitrary, noncapricious rule."). *See also Appalachian Power Co. v. EPA*, 251 F.3d 1026, 1035 (D.C. Cir. 2001), where the court stated that, while the agency has "undoubted power to use predictive models," "it must 'explain the assumptions and methodology used in preparing the model' and 'provide a complete

[10] *See, e.g.* Dr. Tr. 1:145-148 (testimony of Plaintiffs' expert Dr. Keith Eshleman) (assumption that the "curve numbers" would decline over time); 155 ("assuming that the reclamation would occur instantaneously and that vegetation would be restored, infiltration processes would occur that would actually [be] more rapid than what they were in the original forested land"); 156 (stating that these assumptions were "wholly unreasonable and inconsistent with our experience regarding the type of soils and land cover that's likely to exist in these lands following the completion of reclamation"); and 158 (the Corps' conclusion in its decision documents resulted from "endorsing the assumption… that the post mining condition would be immediately returned to vegetation, the soil characteristics and properties that are associated with high rates of infiltration would sort of magically be restored").

analytic defense' should the model be challenged." *Id*. (citations omitted). Even applying deference, the court "cannot excuse the [agency's] reliance upon a methodology that generates apparently arbitrary results particularly where, as here, the agency has failed to justify its choice"). *Id*. Thus, the Corps' reliance on the SWROAs was arbitrary and capricious.

Finally, the Corps in its cumulative impacts sections considered only the "maximum disturbed area" – the maximum acreage for any given permit – as the total impacts for present and future mining activities. To the extent this approach affected the Corps' conclusions, it had the effect of "radically and drastically underestimat[ing] the potential increase in storm runoff during the during mining and post mining phases." Testimony of Dr. Eshleman, Dr. Tr. 1:167.

4. The Corps ignored relevant scientific evidence relating to storm runoff and flooding risks related to surface mines and valley fills

By failing to analyze the effects of its permits upon flooding, the Corps ignored relevant scientific information relating to runoff and flooding risks caused by surface mining and valley fills. Given that the SWROA models for the surface mine permit applications were conducted from three to five years ago, the Corps' failure to review them or conduct a review of the current literature was arbitrary and capricious. In particular, testimony at trial revealed several "highly relevant" scientific studies of effects on runoff and flooding risks of surface mines in the Appalachian Plateau Region, which the Corps failed entirely to consider. Dr. Tr. 1:110-12, 129-130, [11] 158-159. Plaintiffs' hydrology expert Dr. Keith Eshleman opined that, because these studies are "experimental data that describes how watersheds actually function once they're surface mined and reclaimed" these data are "highly relevant," and "it was irrational of the Corps not to give any consideration" to these data. *Id*. at 111. Further, these studies concluded that

[11] The paper cited by Dr. Eshleman at pgs. 129-130 of the transcript was not admitted as evidence at trial. Plaintiffs advert here to Dr. Eshleman's testimony that the paper was a relevant factor that the Corps failed to consider.

surface mines, including sites containing valley fills, had a significant effect upon runoff. *Id*., citing Messinger, *et al.* (Pl. Trial Group Ex. 27). The Corps' failure to conduct a review of this highly relevant information violated NEPA. *See Nat'l Audubon v. Navy*, 422 F.3d at 192-193 (concluding that the agency's failure to distinguish existing studies that contradicted the agency's conclusion "further illustrates its failure to take a hard look at the environmental impacts").

Testimony offered by Intervenor Permittees attempted to counter Plaintiffs' concerns about runoff by suggesting that the increases in runoff will be entirely counteracted by "storage on the watershed" – the sediment control ditches and storage pits located on the active mining site.[12] However, this testimony failed to distinguish relevant scientific studies which demonstrate that the changes in surface conditions associated with surface mines and valley fills lead to increased runoff during and after mining, and that such increases are not attenuated by valley fills but in fact are exacerbated by them. *See* Dr. Tr. 1:109 citing Messinger (2003) (Pl. Trial Group Ex. 27). This testimony also failed to distinguish a study introduced by Intervenor Permittees, which concluded, "on balance, **valley fills are more likely to increase rather than decrease flood potential**." *See* Interv. Trial Ex. 2, Phillips, Jonathan D. (2003) (emphasis added). The Phillips study further stated that "**[i]nfiltration-excess runoff generation is likely to increase post-fill**, due to the generally lower hydraulic conductivities in the fill materials." *Id*. There is no evidence in the records or in testimony to distinguish the permits in this case from the results predicted in the Phillips study. Moreover, there is no evidence in the records or at trial to distinguish testimony that the SWROAs' assumptions about attenuative capacity of

[12] *See, e.g.* Dr. Tr. 4:162 (explaining that the SWROA shows no significant difference in runoff for reasons that "relate[] to storage on the watershed…. During mining, there's a lot of storage on the watershed, and it relates to where that's stored"); 164 (discussing assumption in SWROA for Camp Branch that "there were areas where during the active mining, none of the flow ran off the watershed. It flowed into pits and to other areas").

onsite storage were unrealistic.[13] Finally, the testimony offered by Intervenor Permittees about *during mining* on-site storage does nothing to distinguish testimony and evidence in the record that the assumptions about *post-mining* conditions were unrealistic. The Corps' failure to distinguish these studies renders its conclusion arbitrary and capricious. *See Nat'l Audubon v. Navy*, 422 F.3d at 192-193 (failure to distinguish contrary studies indicates a failure to take a "hard look" at the problem).

D. The Corps Conducted a Wholly Invalid Analysis of the Effects on Riffle and Pool Complexes, "Special Aquatic Sites" Under CWA § 404(b)(1) Guidelines

The § 404(b)(1) Guidelines require the Corps to determine whether "riffle and pool complexes," which are designated as "special aquatic sites" under the Guidelines, will be degraded by the § 404 permits. *See* 40 C.F.R. § 230.45. That section provides a detailed definition of riffle and pool complexes.[14] The Corps' obligation to consider impacts to riffle and pool complexes – and the detailed regulatory definitions governing its determination – arise from this regulation, promulgated in 1980 (45 Fed. Reg. 85344, Dec. 24, 1980).

The stream habitat surveys for each of the permit applications indicates that riffle and pool complexes exist in the § 404 permit areas.[15] However, the Corps concluded that the Camp

[13] *See* Dr. Tr. 1:164 ("the experience we have with these sediment control structures, namely these ditches and sediment ponds located at the toe of the valley fill, suggest that for the types of storms we're talking about here, storms with recurrence intervals of 25 years or 100 years, those types of storms would totally overwhelm the storage release capacity of the sediment structures that are being used in these particular mine sites. So I don't think they offer anything but a minimum of attenuative capacity and thus we can't rely on them to do what is claimed in the SWROAs").

[14] "(a) Steep gradient sections of streams are sometimes characterized by riffle and pool complexes. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. Pools are characterized by a slower stream velocity, a streaming flow, a smooth surface, and a finer substrate. Riffle and pool complexes are particularly valuable habitat for fish and wildlife."

[15] *See, e.g.* CMP for Laxare East Mine, Ex. 2 to Pl. Mot. for Prelim. Inj. for Laxare (Dkt. # 155) at 165-174 (measurements of riffles and pools at every sampling site in proposed pond locations); and 137-150 (measurements showing "optimal" "frequency of riffles" at nearly at every sampling site in valley fill and sediment pond locations).

Branch, Black Castle, Laxare East, and Republic No. 1 mines will not affect riffle and pool complexes.[16] Its basis for this conclusion was a stream classification system devised in 1997, nearly twenty years after EPA and the Corps adopted a detailed definition of riffle and pool complexes in the Guidelines. *See* Dr. Tr. 4:9-10 (Testimony of Ms. Mullins stating that for determinations regarding riffle and pool complexes the Corps relies on the " Montgomery-Buffington Stream Classification"). Because the Corps relied on this non-regulatory classification system, its analysis ignored evidence that riffle and pool complexes as defined by the regulation do exist in the § 404 permit areas.

The Corps improperly relied on the Montgomery *et al.* stream classification system – one of many non-regulatory fluvial classification systems devised since the advent of the study of streams. That system does not even purport to implement the provisions of the § 404(b)(1) Guidelines relating to riffle and pool complexes. *See* Montgomery, *et al*., Channel-Reach Morphology in Mountain Drainage Basins (1997) (attached as Exhibit B to the reissued CDDs). Moreover, evidence at trial and in the records reveal that this classification system is inconsistent with the regulatory definition of riffle and pool complexes in the Guidelines. *See* Testimony of Mr. Edward Kirk, Dr. Tr. 5:36-44.

Mr. Kirk, a consultant who performed stream evaluations for several of the permit applications, testified that he relied upon the Montgomery *et al.* system in evaluating the sites, Dr. Tr. 5:38, and concluded that "the pool areas as described here [in the regulation] are more representative of a step-pool system [under the Montgomery *et al.* system] and they're not so much associated with the riffles," *id.* at 40. Mr. Kirk further testified that he "disagrees" with the

[16] For the Republic No. 2 Mine the Corps concluded, without further explanation, that the valley fills would cause a loss of riffle and pool complexes. Republic No. 2 Reiss. CDD at 12. The Corps has provided no explanation for this different conclusion at the Republic No. 2 Mine.

regulatory definition, *id*. at 37, and prefers to apply his own reading under the Montgomery *et al.* system in assessing the streams in this case. *Id*. at 42. In particular, he expressed the opinion that riffles, as defined by Montgomery *et al*., do not exist at the fill sites because the areas are "too steep," *id*. at 41. However, the opening sentence in the regulatory definition *specifies* that riffle and pool complexes exist in high gradient streams. *See* 40 C.F.R. § 230.45 ("Steep gradient sections of streams are sometimes characterized by riffle and pool complexes"). Indeed, Mr. Kirk testified that the pool areas described in the regulatory definition at 40 C.F.R. § 230.45 "are more representative of a step-pool system" under the Montgomery *et al.* system – precisely the type of habitat the Corps determined exists in the valley fill areas in its CDDs. Dr. Tr. 5:40.

Regardless of the differences in nomenclature between the regulation and the Montgomery *et al.* classification system, the controlling definition is the definition adopted by the EPA and the Corps in the § 404(b)(1) Guidelines. The Corps cannot escape this long-standing regulatory definition simply by relying on a new definition that it prefers. The Corps' reliance on a stream classification system that does not purport to implement the regulatory definition, and is plainly inconsistent with the regulation, was absurd. Its conclusion that riffle and pool complexes do not exist based on this system was thus arbitrary and capricious.

E. The Corps Ignored Relevant Evidence Regarding the Cumulative Effects of the Permits on the Ecosystem in the Region

The Corps failed to explain how the facts set forth in its decision documents support the agency's conclusion that the permits would not cause cumulative impacts. This failure violated NEPA and the CWA, and was arbitrary and capricious.

1. The Corps failed to demonstrate how the facts support its conclusion that the permits will not cause or contribute to significant cumulative effects

For each permit, the Corps prepared an "identification of relevant past and present activities" and an "identification of future activities and their potential impacts" upon the small

creek watersheds where the permits are located.[17] However, without further analysis or explanation, the Corps simply recited the conclusion that the permits would cause no cumulative impacts. *See*, Laxare East Reiss. CDD at 55 ("Based on the expectation of continued sustainability of all resources, it has been determined cumulative effects on the aquatic environment would not be considered significant").[18] The Corps has provided no analysis or scientific evidence to support its conclusion that, for example, the Laxare East Mine permit will not cause or contribute to significant cumulative impacts in the Laurel Creek watershed where approximately 18% of the first-order headwater streams in the watershed are covered by valley fill permits. *See* Dr. Tr. 1:56 (Testimony of Douglas Pflugh).

An agency action is invalid if the agency has failed to "examine the relevant data and articulate a satisfactory explanation for those actions including a 'rational connection between the facts found and the choices made.'" *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto Ins. Co.*, 463 U.S. 29, 43 (1983). Here, the Corps' approach of merely reciting statistics about the cumulative impacts of its permits, then tacking on a disembodied conclusion without further analysis or scientific support falls far short of this requirement. The Corps' cumulative impacts analyses were therefore arbitrary and capricious.

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[17] For instance, among the numerous and significant cumulative impacts the Corps identified but did not analyze were: *E.g.* Laxare East Reiss. CDD at 51-55 (*inter alia*, "[w]ithin the Laurel Creek watershed, the site of the proposed surface mine facility, approximately 9,559 acres or 30.2%... of the 31,519-acre watershed are currently permitted for surface and underground mining. *Id*. at 52); Camp Branch Reiss. CDD at 27-30 (*inter alia*, "total past, present and reasonably foreseeable future impacts in the Dingess Rum watershed cover 45.4% of the area. *Id*. at 29); Republic No. 2 Reiss. CDD at 14-17 (*inter alia*, 63.6% of the Fifteenmile Fork and Cabin Creek watersheds have been affected by past present and anticipated future mining activities. *Id*. at 15); Black Castle Reiss. CDD at 49-52 (*inter alia*, 11.2% of the stream channels in the Laurel Creek watershed are covered by valley fill permits. *Id*. at 51).

[18] *See also Black Castle* Reiss. CDD at 52 (*verbatim*); Camp Branch Reiss. CDD at 30 (*verbatim*); Republic No. 2 Reiss. CDD at 17 ("The implementation of various programs aimed at restoring habitats and ecosystems should result in improved fish and wildlife values…. All of these factors should result in continued sustainability …."); Republic No. 1 Reiss. CDD (citing applicant's conclusion that there would be no cumulative impacts based on measures to address sediment and reclamation, and noting that "the permit would be conditioned to include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem").

2. The Corps arbitrarily limited the scope of analysis to the stream watersheds

The Corps provided no explanation or evidence to support its decision to limit the analysis of cumulative impacts to the streams in the small watersheds where the mines are located. This approach violated NEPA because the stream effects are interdependent with the terrestrial effects of the valley fill and mining activities. Further, the mining activities are entirely conditional on the Corps' § 404 permits. Finally, there is no scientific basis for arbitrarily limiting the Corps' analysis to the small creek watersheds and ignoring actual impacts to larger areas.

The mining companies in this case concede that the permits cannot proceed without the Corps' CWA permit that authorizes the valley fills. *See* Opp. to Mot. for P.I. for Laxare (Dkt. # 156) at 2. (stating that the Laxare East Mine "cannot construct valley fills needed to conduct surface mining operations" without the Corps' § 404 CWA permits). Therefore, the Corps must consider the impacts of the related mining activities in its NEPA analysis. Under the Corps' own regulations, where a permit applicant proposes to conduct "a specific activity . . . which is merely one component of a larger project," the Corps must consider the entire project in its NEPA review. *See* 33 C.F.R. § 325, App. B §§ 7(b)(1), (2). Specifically, the regulations emphasize that the Corps must consider and analyze the environmental consequences of a larger project that are "essentially the products of the Corps permit action." 33 C.F.R. § 325, Appx B § 7(b).

The Corps acknowledged the interdependency of its CWA permits and State surface mine permits in a February 14, 2005 Memorandum of Understanding with OSM, FWS and EPA concerning "Concurrent and Coordinated Review and Processing of Surface Coal Mining Applications Proposing Placement of Dredged and/or Fill Material in Waters of the United States." According to this MOU,

> [T]he Corps District or Division Engineer would collaborate with the SMCRA regulatory authority, combining respective mining/civil engineering, geological, biological, hydrologic, water quality and other expertise of each agency to collaborate in considering all practicable alternative to the proposed placement of dredged and/or fill material in waters of the U.S. This joint review would examine alternatives to avoid and minimize impacts, and whether appropriate alternatives analyses have been performed. In addition, the joint review could help to determine if the proposed fill sites located in waters of the U.S. have been adequately minimized and characterized and whether practical upland alternatives or less environmentally damaging alternatives to the project proposal exist.

MOU, pp. 7-8. The Corps therefore acknowledges that its control and responsibility overlaps with the mining permit and includes impacts on upland areas.

Second, it is a violation of NEPA for the Corps to limit its review to navigable waters and ignore the entire affected area. *See Save Our Sonoran, Inc. v. Flowers*, 408 F.3d 1113, 1122 (9th Cir. 2005); s*ee also Friends of the Earth v. U.S. Army Corps of Eng'rs*, 109 F. Supp. 2d 30 (D.D.C. 2000) (Corps required to consider development resulting from and conditional on the permitted activity); *See also Arkansas Nature Alliance v. Army Corps of Eng'rs*, 266 F. Supp.2d 876, 891-92 (E.D. Ark. 2003) (same); *Sierra Club v. Marsh*, 769 F.2d 868, 881 (1st Cir. 1985) (Breyer, J.) (quoting 40 C.F.R. § 1508.8, and stating that relevant effects for NEPA "indirect effects" analysis may include "growth inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems").

As in *Sonoran*, here the "jurisdictional waters run throughout the property like capillaries through tissue, [thus] any development the Corps permits would have an effect on the whole property." 408 F.3d at 1122. The interrelationships in the watershed ecosystems affected by the mines here are such that effects on navigable waters cannot be considered without considering how the mining activities also contribute to those impacts, and vice versa. For example, removing surrounding forest cover in order to mine and fill the streams directly contributes to

stream degradation. *See* Testimony of Dr. Palmer, stating that adverse impacts on water quality generally appear once you have cleared 10 to 12% of a given watershed. Dr. Tr. 2:208-209; Eshleman Testimony, Dr. Tr. 1:165-66 (stating that the greater proportion of the watershed that is disturbed by land use changes, "the greater the effect will be on runoff and flooding within those watersheds") An environmental analysis that ignores environmental effects that are the direct result of the Corps' permit, are ecologically interrelated with the permits, and that act on the ecosystem cumulatively with the impacts caused by the Corps' permits, violates NEPA.

3. The Corps rendered its analysis for two mines meaningless by adopting uncritically information provided by the applicants that misused GIS data

Trial testimony from Plaintiffs' expert in GIS analysis, Douglas Pflugh, established that for two of the mines (Laxare East and Black Castle) the Corps adopted information provided by the permit applicants that purported to contain a GIS analysis of the past and present impacts of various land use activities in the watersheds. Dr. Tr. 1:62 There is no evidence that the Corps made an effort to review or verify this information. Mr. Pflugh's testimony demonstrated that the Corps' cumulative impacts analysis for these mines was invalid because it relied on a misused and misinterpreted GIS data. The GIS analysis was defective for several reasons.

First, the analysis purported to assess past and present impacts in the watersheds where the mines are located. However, "to say they represent two different time periods was incorrect," thus the data was "misused." Dr. Tr. 1:62.[19] Second, the data used in the analysis was "not developed nor intended for the relatively small area analysis that was performed" for the Corps' cumulative impacts analysis. *Id.* 1:64. Indeed, the developers of the GIS database expressly warned against using the data for the type of small-scale application that the Corps

[19] Explaining the overlap in the two datasets, Mr. Pflugh stated in his testimony, "I believe it's four cases they actually use the same images in both datasets." He has since informed counsel for Plaintiffs that this statement was in error, and three images, rather than four, are duplicated in the datasets. Pers. commun. Oct. 4, 2006.

used it for in the cumulative impacts analysis for these two mines. Dr. Tr. 1:65. Yet, contrary to express warnings against using the data to present acreage figures of less than a thousand hectares, the Corps used it to present figures "down to decimal places." Dr. Tr. 1:66. The Corps also inappropriately used the data to express results with certainty, contrary to specific warnings against such use. Dr. Tr. 1:64-67 (explaining that "[it] was inappropriate to use these data both from a scale concern and from a certainty [concern]"). In particular, the Corps used the data to determine a regulatory outcome, without using other means such as field surveys to verify the data, contrary to a specific warning contained in the GIS database against such use. Dr. Tr. 1:68. In short, the Corps relied on misinterpreted and misused GIS data, and this rendered the conclusions the Corps reached based on these data "meaningless." Dr. Tr. 1:68-69.

Mr. Pflugh also testified that these defects cannot be corrected simply by adding more acreage figures into the assessment, or ignoring numbers generated by the inappropriate use of GIS data. According to Mr. Pflugh, under that approach, "although they'd come up with a number, that number wouldn't have any meaning." Dr. Tr. at 80-81. Thus, the Corps cannot avoid the problem by arguing that its analysis increased the amount of area deemed by the Corps to be impacted. *Id*. Rather, "[w]hat would've more appropriately been done would be to do a correct appropriate land cover analysis, add that number that has meaning to the total so that we have a meaning[ful] cumulative impacts analysis rather than just a number." The Corps' failure to address these defects in its analysis was arbitrary and capricious.

III. THE CORPS VIOLATED NEPA BY IGNORING EVIDENCE THAT THE MITIGATION PLANS WILL NOT REPLACE LOST ECOSYSTEM FUNCTIONS

The Corps suggests that it can rely upon mitigation to justify its failure to prepare an EIS for each of the permits in this case. *See* Dr. Tr. 4:239 (stating that each of the permits in this case were issued based on a "mitigated FONSI," a "determination of the finding of no significant

impact based on the consideration to the mitigation"). However, the evidence reveals that the mitigation for the permits in this case is speculative and has no sound scientific basis. *See* Stmt. of Facts, *supra* section IV. Thus, the Corps' reliance on "mitigated FONSIs" was unlawful.

The Fourth Circuit allows agencies to avoid preparing an EIS only if the mitigation "eliminates all significant environmental effects." *See Roanoke R.. Basin Ass'n v. Hudson*, 940 F. 2d 58, 62 (4th Cir. 1991). The Corps does not even claim that the mitigation for the permits in this case will eliminate all significant environmental effects. Further, there is no scientific basis for the Corps' assertion that compensatory mitigation will reduce impacts to insignificance. It is simply a conclusory assertion without any supporting analysis or evidence. The Corps has not cited a single study or other evidence to support its conclusion that mitigation will achieve the required statutory standard of minimal effects. When the Corps' finding of insignificance relies on mitigation measures, it must provide "substantial evidence to support the efficacy" of the proposed mitigation. *See Nat'l Audubon Soc'y v. Hoffman*, 132 F.3d 7, 17 (2d Cir. 1997). The Corps cannot "merely recite[] the offsetting mitigation measures without analyzing how those mitigation measures will actually reduce or offset the significant impacts to acceptable levels." *O'Reilly v. U.S. Army Corps of Eng'rs*, 2004 WL 1794531 (E.D. La. Aug. 10, 2004).

There is also no scientific basis for the notion that permanent destruction of a stream can be mitigated or offset by "enhancing" another stream elsewhere. The enhanced stream may be downstream of the buried headwater stream, or in a different watershed. In particular, Ms. Mullins affirmed in testimony at trial that the streams that are "enhanced" for mitigation are perennial, and that what is lost in the destruction of ephemeral and intermittent streams is not the same as what might be gained at the mitigation sites. *See* Dr. Tr. 4:237. The Corps offers no evidence that that this type of mitigation will replace lost resources. Instead, the only basis for

the Corps' determination is the "best professional judgment" of Corps staff that the mitigation replaces, roughly, what is lost. *Id.* As discussed above, this approach is not a valid assessment.

Second, the courts have rejected mitigated FONSIs that were based – as is the case here – on mitigation measures that are speculative or experimental. The Second Circuit, for example, requires that mitigation measures be supported by "substantial evidence." *Nat'l Audubon Soc'y v. Hoffman*, 132 F.3d 7, 17 (2d Cir. 1997). There the court rejected a proposed mitigation measure as the basis for a FONSI, stating "we have no assurance of [the mitigation measure's] efficacy . . . [and the agency] did not consider alternatives in the event [that measure] fails." *Id.*

Similarly, in *Nat'l Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722 (9th Cir. 2001), the Court found a FONSI for a proposed increase in cruise ships to be inadequate because "the Parks Service did not conduct a study of the anticipated effects of the mitigation measures nor did it provide criteria for an ongoing examination of them or for taking any needed corrective action (except for the plan to conduct 'studies'). As with the rest of its proposal, it planned to act first and study later." *Id.* at 734. There the 9th Circuit took the agency to task for statements that "mitigation measures '*could* mitigate some potential effects to humpbacks in concentrated whale-use areas'; '*could* reduce whale/vessel collisions and reduce the noise emanating from the ships'; '[s]pecial-use-area closures and restrictions implemented under … alternative [five] *may* offset some of the expected disturbance.' Air pollution measures '*would be expected to* contribute to a reduction in cruise ship stack emissions over time.'" *Id.* at 735 (emphasis in original). These speculative statements, with "no indication . . . as to how long any such [air pollution] reduction might take or how great a reduction might ultimately be accomplished" were insufficient to support the FONSI. The Court concluded:

> The EA's speculative and conclusory statements are insufficient to demonstrate that the mitigation measures would render the environmental impact so minor as

> to not warrant an EIS. . . The fact that the agency plans to test the effect of its mitigation measures does not relieve it of the obligation to prepare an EIS prior to the time of the threatened environmental damage… We simply hold that, under these circumstances, where significant environmental damage may occur to a treasured natural resource, the studies must be conducted first, not afterwards.

Id. See also O'Reilly v. US Army Corps of Eng'rs, 2004 WL 1794531, at *5 (E.D.La. 2004) (finding mitigated FONSI arbitrary and capricious because "[w]ithout the collection or analysis of relevant data, the Court is left to assume that the Corps based its decision on speculation that the impacts would be successfully mitigated."); *Am. Canoe Ass'n v. White*, 277 F. Supp. 2d 1244, 1262-63 (N.D. Ala. 2003) ("the COE worked with the permit-holder to establish a watershed management plan that it *hopes* will reduce nonpoint source pollution…. Because the record does not support the COE's assumption that nutrients will be reduced by 60%, the court finds that a remand is necessary") (emphasis in original).

In sum, the Corps cannot overcome fundamental problems with its mitigation plans. These plans claim that the adverse effects of valley fills can be mitigated by (1) creating new streams (2) restoring damaged streams, and/or (3) enhancing off-site perennial streams. However, Dr. Palmer noted that she is not aware of a single study in the peer reviewed scientific literature that has evaluated the feasibility of building streams *de novo*. Dr. Tr. 2:202. Thus, the stream "creation" components of the mitigation plans are wildly speculative. Further, because the Corps entirely failed to address the loss of stream ecosystem function in its mitigation plans, there is no evidence that the loss of the unique functions provided by headwater streams can be replaced by "enhancing" offsite perennial streams.

IV. CONCLUSION

The evidence demonstrates that the Corps' analyses of the individual and cumulative effects of its permits and of the mitigation plans were riddled with omissions and defects. These

defects rendered the Corps' "Findings of No Significant Impact" and its decisions to issue each permit completely invalid. *See Nat'l Audubon Soc'y v. Dept. of Navy*, 422 F.3d 174 at 200.

V. RELIEF

(1) **Clean Water Act.** Plaintiffs request the Court to declare that the permits in this case violate Clean Water Act § 404, and to reverse and vacate the permit decisions pursuant to § 404 of the CWA; 33 U.S.C. § 1344, the § 404(b)(1) Guidelines, in particular 40 C.F.R. § 230.10(c); the Corps' Regulations for implementing CWA § 404 and NEPA, 33 C.F.R. § 323.6; and the APA, 5 U.S.C. § 706(A)(2).

(2) **NEPA.** Plaintiffs request the Court to declare that the permits in this case violate NEPA, to reverse and remand each of the permit decisions in this case, and to order the Corps to prepare an analysis of environmental impacts that complies with NEPA prior to issuing a permit for these mines pursuant to NEPA, 42 U.S.C. § 4332(2)(C), and the APA, 5 U.S.C. § 706(A)(2).

/s/ Joseph M. Lovett
JOSEPH M. LOVETT
Appalachian Center for the
Economy and the Environment
P.O. Box 507
Lewisburg, WV 24901
(304) 645-9006
jlovett@appalachian-center.org

/s/ *Jennifer C. Chavez*
STEPHEN E. ROADY
JENNIFER C. CHAVEZ
Earthjustice
1625 Massachusetts Av. NW, Suite 70
Washington, DC 20036
Phone: (202) 667-4500
Fax: (202) 667-2356
sroady@earthjustice.org
jchavez@earthjustice.org

Counsel for the Plaintiffs

Dated: November 3, 2006

CERTIFICATE OF SERVICE

I, Jennifer C. Chavez, hereby certify that on November 3, 2006, I electronically filed the foregoing Plaintiffs' **Post-Trial Brief** with the Clerk of the Court using the CM/ECF system, which will send notification of such filing to the following CM/ECF participants:

James S. Crockett, Jr.
Kelly B. Griffith
Spilman Thomas & Battle, PLLC
Spilman Center
300 Kanawha Boulevard East
P.O. Box 273
Charleston, West Virginia 25321-0273
jcrockett@spilmanlaw.com
kgriffith@spilmanlaw.com

Ruth Ann Storey
U.S. Department of Justice
Environment & Natural Resources Division
General Litigation Section
P.O. Box 663
Washington, DC 20044-0663
ruth.ann.storey@usdoj.gov

Cynthia J. Morris
U.S. Department of Justice
Environment & Natural Resources Division
Environmental Defense Section
P.O. Box 23986
Washington, DC 20026-3986
c.j.morris@usdoj.gov

Stephen M. Horn
U.S. Attorney's Office
P.O. Box 1713
Charleston, WV 25326-1713
Steve.Horn@usdoj.gov
usawvs.ecfcivil@usdoj.gov

Robert G. McLusky
Blair M. Gardner
Jeffrey R. Vining
Jackson Kelly, PLLC
1600 Laidley Tower
Post Office Box 553
Charleston, West Virginia 25322
rmclusky@jacksonkelly.com
bgardner@jacksonkelly.com
jrvining@jacksonkelly.com
aroehl@jacksonkelly.com
rjeffries@jacksonkelly.com
sbo@jacksonkelly.com

I hereby certify that I have mailed the document by United States Postal Service to the following non-CM/ECF participants:

Allyn G. Turner
Spilman Thomas & Battle
P. O. Box 273
Charleston, WV 25321-0273

Ann D. Navaro
U. S. Army Corps Of Engineers
Great Lakes and Ohio River Division
P. O. Box 1159
Cincinnati, OH 45201

Steven E. Rusak
U.S. Department Of Justice
Environment & Natural Resources Division
Environmental Defense Section
Byron Rogers Federal Building
1961 Stout Street - 8th Floor
Denver, CO 80294

I hereby certify that, pursuant to US District for the Southern District of West Virginia, Administrative Procedures for Electronic Case Filing, Rule 13.9, I have mailed a courtesy copy by United States Postal Service to:

Honorable Robert C. Chambers
United States District Judge
Post Office Box 1570
Huntington, WV 25716

/s/ Jennifer C. Chavez

JENNIFER C. CHAVEZ
Earthjustice
1625 Massachusetts Av. NW, Suite 702
Washington, DC 20036
Phone: (202) 667-4500
Fax: (202) 667-2356
jchavez@earthjustice.org