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January 21, 2004

Via Email (forren.john@epa.gov)

Mr. John Forren
U.S. Environmental Protection Agency
Region III (3EA30)
1650 Arch Street
Philadelphia, PA 19103

Re: Supplemental Comments on Draft Programmatic Environmental Impact Statement (DEIS) on Mountaintop Removal Mining/Valley Fill Activities in Appalachia, announced at 68 Fed. Reg. 32487 (May 30, 2003).

Dear Mr. Forren:

The West Virginia Highlands Conservancy and the Ohio Valley Environmental Coalition submit the following supplemental comments on the Draft Environmental Impact Statement (DEIS) for mountaintop removal mining and valley fills in Appalachia. These comments supplement prior comments submitted on January 5, 2004.

We demonstrated in our initial comments that mountaintop removal mining and valley fills (MTM/VF) are associated with violations of the stream water quality criteria for total selenium in West Virginia. We criticized the DEIS for falsely claiming that "the EIS studies did not conclude that impacts documented below MTM/VF operations cause or contribute to significant degradation of waters of the U.S." DEIS, p. II.D-9. We also criticized the DEIS for failing to propose any remedies for those selenium violations.

A new study released by the U.S. Fish and Wildlife Service (FWS) confirms the seriousness of the selenium problem. During the spring and summer of 2003, FWS conducted a survey of selenium in fish, water, and sediments in streams in southern West Virginia. In a January 16, 2004 letter to the West Virginia Department of Environmental Protection (attached), the Supervisor of FWS' Pennsylvania Field Office, David Densmore, concludes that:

- Selenium was present in all fish samples.
- Selenium concentrations in fish in three watersheds exceeded the toxic effect threshold level for whole fish.
- Selenium is bioavailable in West Virginia streams, and violations of the EPA selenium water quality criterion may result in selenium concentrations in fish that could adversely affect fish reproduction.

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- In some cases, fish tissue concentrations were near levels believed to pose a risk to fish-eating birds.

In light of this study, the DEIS has no scientific basis for claiming that MTM/VF operations do not cause or contribute to significant degradation of waters of the U.S. The FWS study demonstrates that significant degradation is already occurring. EPA's 404(b)(1) Guidelines prohibit activities that cause significant degradation of aquatic ecosystems. 40 C.F.R. § 230.10(c). Therefore, the DEIS must address this issue and propose remedies to eliminate all existing and potential stream degradation due to selenium contamination from MTM/VF activities.

Sincerely,

James M. Hecker

James M. Hecker

Counsel for the West Virginia Highlands Conservancy and the Ohio Valley Environmental Coalition

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pennsylvania Field Office
Suite 322
315 South Allen Street
State College, Pennsylvania 16801

January 16, 2004

Allyn Turner
Director, Division of Water and Waste Management
West Virginia Department of Environmental Protection
414 Summers Street
Charleston, WV 25301

Dear Ms. Turner:

During the spring and summer of 2003, we conducted a survey of selenium in fish, water, and sediments in various waterbodies in southern West Virginia. Because U.S. Environmental Protection Agency studies for the draft Environmental Impact Statement on Mountaintop Mining/Valley Fills found high selenium concentrations in waters downstream of valley fills, and selenium is highly bioaccumulative and toxic to fish and wildlife, we were interested in determining whether the waterborne selenium downstream of valley fills is accumulating in fish tissues to ecologically relevant levels. In addition, because mercury is associated with coal and also bioaccumulates, we initially included mercury in our chemical analysis.

We conducted our sampling May 28-30, and August 19-21, 2003. Most of the streams we sampled were previously sampled for selenium in water by EPA or WVDEP. As a cost-saving measure, we did not collect water samples in those locations; however, we did collect a sediment sample at each location. When sampling stream fish, we targeted primarily creek chubs and blacknose dace. These species are efficient bioaccumulators of selenium (bioaccumulation factors of 4,545 and 4,590, respectively; Mason *et al.* 2000), and would be expected to serve as a food source for birds such as the belted kingfisher and great blue heron. Selenium in fish consumed by these birds could be transferred to offspring in bird eggs, resulting in embryo mortality or deformity (Lemly 2002).

We also sampled East Lynn and Beech Fork Lakes in Wayne County, and one stream in each of their watersheds (Trough Fork and Miller's Fork, respectively). The East Lynn watershed is heavily mined, while the Beech Fork watershed is relatively undisturbed by mining. For the lakes, we targeted bluegill, largemouth bass, gizzard shad, and white crappie. Samples included whole fish, fillet (left side, skin on, scaled), and eggs.

Table 1 provides results for streams in the Little Coal/Coal River, Big Coal River, and Mud River watersheds, and one sedimentation pond downstream of a valley fill at the head of Trace

Branch. Table 2 provides results for East Lynn and Beech Fork Lakes, and Trough and Miller's Forks.

Mercury analysis was conducted only on samples collected in May. Mercury was found in only one stream fish sample (creek chubs from Stanley Fork), but was present in many of the lake fish samples. Mercury was not found in any of our sediment samples, or in any of four water samples. Because of the low incidence of detections in the stream samples, we did not submit the August stream samples for mercury analysis.

Selenium was present in all fish samples. As a guideline for evaluating the ecological significance of the selenium concentrations, we used Lemly (2002). Based on a synthesis and interpretation of scientific literature, Lemly has established "toxic effect thresholds for selenium in aquatic ecosystems," which he describes as "levels at which toxic effects begin to occur in sensitive species of fish and aquatic birds. They are not levels that signify the point at which all species die from selenium poisoning" (p. 31). Lemly's values and associated biological effects in fish are 8 ppm (dw) for fillets[1] (reproductive failure); 10 ppm for eggs (reproductive failure); and 4 ppm for whole fish (mortality of juveniles and reproductive failure). For reproductive failure in birds, Lemly cites 7 ppm in food chain organisms.

Creek chubs and blacknose dace collected from Trace Branch, Sugartree Branch, and Stanley Fork (where EPA or WVDEP had previously identified selenium water concentrations above the EPA chronic water quality criterion of 5 µg/l) contained selenium at concentrations above Lemly's 4 ppm toxic effect threshold level for whole fish. Our water sample from a valley fill sedimentation pond at the head of Trace Branch hollow contained 6.44 µg/l selenium, and bluegill captured in the pond contained 6.89 ppm selenium. Selenium levels in fish samples from the Trace Branch pond and Sugartree Branch were just below the 7 ppm threshold value for reproductive failure in birds.

Fish from several streams where other agencies had documented stream selenium concentrations greater than the EPA criterion did not exceed the Lemly threshold values. Among many possible explanations for this is evidence that other water quality parameters, especially sulfates, can interfere with selenium uptake (Great Lakes Environmental Center 2002). In studies related to the EIS for mountaintop mining, EPA identified high sulfate concentrations at many sampling locations.

No fish or fish eggs collected from Beech Fork Lake or East Lynn Lake contained selenium at concentrations above Lemly's thresholds. However, tissue selenium concentrations were generally higher in the East Lynn samples, and long-term monitoring of this situation is advisable. Selenium concentrations in creek chub samples from both Trough Fork and Miller's Fork were low relative to other streams in our survey.

Our results show that selenium present in surface waters in southern West Virginia is bioavailable, and that violations of the EPA selenium water quality criterion may result in

[1]Note that Lemly's fillet values are for skinless fillets, and our samples were skin-on.

selenium concentrations in fish that could adversely affect fish reproduction. In some cases, fish tissue concentrations were near levels believed to pose a risk to fish-eating birds. It is likely that benthic invertebrates in some of these streams would be similarly contaminated, thereby posing a risk to birds that depend upon aquatic insects as a food supply (e.g., Louisiana waterthrush). Accordingly, we believe that the potential for release of selenium during and after mining should be assessed to ensure that future permits are not issued where there is a likelihood that selenium water quality standards will be violated. We are aware that the West Virginia Geological Survey has analyzed the selenium content of coal in various locations (www.wvgs.wvnet.edu/www/datastat/te/Maps/Semapmax.gif). If those results can be correlated to the selenium water and fish data, it may be possible to develop coal and/or overburden analysis requirements for permit applicants that would characterize the degree of selenium risk associated with a given application.

If you have any questions regarding this information, please contact Cindy Tibbott of my staff at 814-234-4090, ext. 226.

Sincerely,

David Densmore
Supervisor

Literature Cited

Great Lakes Environmental Center. 2002. Draft aquatic life water quality criteria for selenium. Traverse City, MI.

Lemly, A.D. 2002. Selenium assessment in aquatic ecosystems: Aguide for hazard evaluation and water quality criteria. New York: Springer-Verlag New York, Inc. 162 pp.

Mason, R. P., J-M. Laporte, and S. Andres. 2000. Factors controlling the bioaccumulation of mercury, arsenic, selenium, and cadmium by freshwater invertebrates and fish. Arch. Environ. Contam. Toxicol. 38:283-297 (as cited in Great Lakes Environmental Center 2002).

Location, collection date, lat/long	Sediment [1] Se (ppm dw)	Water Se and Hg (µg/l)	Fish species & tissue	Mean fish size (mm)	Tissue Se (ppm, dw)	Tissue Hg[2] (ppm, dw)
Beech Fork Lake June 3, 2003 38.3133, -82.36219	ND (<0.238)	ND (Hg <0.100 Se <2.50)	Bluegill - 5 whole fish	100	0.600	ND
			Bluegill - 3 gravid females	149	0.635	ND
			Largemouth bass - 3 whole fish	328	0.871	0.613
			White crappie - 5 fish	125	0.600	0.360
			Largemouth bass - fillets from 1 gravid female	455	1.76 dw, 0.422 ww	2.16 dw, 0.517 ww
			Largemouth bass - fillets from 1 gravid female and 1 male	400 (f) 370 (m)	1.26 dw, 0.490 ww	0.368 dw, 0.143 ww
			Bluegill - eggs from 3 fish	153	1.08	ND
			Largemouth bass - eggs from 1 fish (same fish used for fillet, above)	455	2.06	ND
			Largemouth bass - eggs from 1 fish	400	2.48	ND
Trough Fork June 4, 2003 38.04561, -82.25049	ND (<0.248)		Creek chub	7.5-10 (5 fish)	0.564	ND
Miller's Fork June 4, 2003 38.04561, -82.25049	ND (<0.243)		Creek chub	7.5-8.5 (5 fish)	0.713	ND

[1] Mercury was not detected in sediments. The detection limits ranged from 0.917 to 0.0990 ppm.

[2] Mercury detection limits for tissue samples ranged from 0.145 to 0.200 ppm.

Table 1. Results of sediment, water, and fish tissue analyses for selenium and mercury in samples collected from various waterbodies in southern West Virginia.

Location, collection date, lat/long	Other agency station code	Other agency Se water (mean, ug/l)	Sediment Se (ppm)	Water Se and Hg (ug/l)	Fish species (whole fish)	Mean fish size (mm)	Fish Se (ppm, dw)	Fish Hg^2 (ppm,dw)
Little Coal/Coal River Watersheds								
Spruce/White Oak Branch 28-May-03 37.86289, -81.803831	EPA MT 39	ND (<2.99)	ND (<0.229)		Creek chub	101	1.86	ND
					Creek chub	146	1.43	ND
					Creek chub	72	3.19	ND
Coal/Trace Branch Pond 29-May-03 37.87704, -81.84137			0.525	Hg-ND (<0.100) Se- 6.44	Bluegill	152	6.89	ND
Coal/Left Fork Beech 28-May-03 37.905423, -81.846021	EPA MT 34B	22.7	0.486		Creek chub	142	3.05	ND
Coal/Trace Branch 29-May-03 37.87655, -81.83786	WVDEP WVKC-10-T-19	6.4	ND (<0.240)		Creek chub	159	5.5	ND
					Creek chub	100	6.04	ND
Big Coal River Watershed								
Ewing Fork 20-Aug-03 37.91087, -81.32799	EPA MT 69	ND (<2.99)	0.221	Hg 1.5 Se ND (<2.5)	Blacknose dace	77	2.9	
Clear Fork/Sycamore Creek 20-Aug-03 37.93762, -81.42299	EPA MT 81	ND (<2.99)	0.113	Hg 1.01 Se ND (<2.5)	Blacknose dace	71	2.45	
					Creek chub	109	0.845	
Clear Fork/Rockhouse Creek 19-Aug-03 37° 57.852, -81° 30.096	WVDEP WVKC-47A	<5	0.455		Blacknose dace	77	1.86	
					Creek chub	92	1.33	
White Oak/ Left Fork 19-Aug-03 38 03 0.7, 81 31 41	WVDEP WVKC-35E	7	1.49		Creek chub	98	1.73	
Seng Creek 20-Aug-03 37° 59.951, 81° 29.274	WVDEP WVKC-42	16	0.479		Blacknose dace	84	2.75	
					Creek chub	135	2.08	
Buffalo Fork 20-Aug-03 37.899, -81.331	EPA MT 64	13	0.387		Blacknose dace	72	0.91	

Table 2. Results of sediment, water, and fish tissue analyses for selenium and mercury in samples collected from East Lynn and Beech Fork Lakes, and Trough and Miller's Forks, Wayne County.

Location, collection date, lat/long	Sediment [1] Se (ppm dw)	Water Se and Hg (µg/l)	Fish species & tissue	Mean fish size (mm)	Tissue Se (ppm, dw)	Tissue Hg [2] (ppm, dw)
East Lynn Lake June 2, 2003 38.04561, -82.25049	ND <0.238	ND <.0999 Hg <2.5 Se	Bluegill - 5 whole fish	89 - 113	1.60	ND
			Gizzard shad - 5 whole fish	89 - 100	3.29	ND
			Largemouth bass - 1 whole fish (female, eggs removed)	260	1.72	0.340
			Largemouth bass - 2 whole fish	272	3.84	0.370
			White crappie - 2 whole fish	201	0.863	0.175
			Largemouth bass - fillets from 5 fish	337	3.26 dw, 0.772 ww	1.00 dw, 0.238 ww
			Gizzard shad - eggs from 1 fish	285	3.54	ND
			Largemouth bass - eggs from 1 fish (remainder analyzed whole – see above)	260	3.17	ND
			Largemouth bass - eggs from 3 fish	343	4.73	ND

Table 1 (continued).

Location, collection date, lat/long	Other agency station code	Other agency Se water (mean, ug/l)	Sediment Se (ppm)	Water Se and Hg (ug/l)	Fish species (whole fish)	Mean fish size (mm)	Fish Se (ppm, dw)	Fish Hg[1] (ppm,dw)
Mud River Watershed								
Mud/Rushpatch Branch	EPA MT 02	ND (<2.99)	ND (<0.0679)	Hg 0.952 Se ND (<2.5)	Blacknose dace	59	0.907	
21-Aug-03					Creek chub	109	<0.481	
38.04966, -81.93302								
Mud/Stanley Fork	EPA MT 15	12.1	ND (<0.245)		Creek chub	185	4.13	0.28
30-May-03					Creek chub	84	5.11	ND
38.08506, -81.95601								
Mud River	EPA MT 23	12.9	0.134		Creek chub	108	1.4	
21-Aug-03								
38.09191, -81.97446								
Mud/Sugartree Branch	EPA MT 16	36.8	0.192		Blacknose Dace	75	6.52	ND
30-May-03					Creek chub	104	6.85	ND
38.09084, -81.95262								

[1] Mercury detection limits for fish tissue samples ranged from 0.145 to 0.200 ppm. August 2003 fish samples were not submitted for mercury analysis.