



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 17 2011

THE ADMINISTRATOR

Duncan T. Patten, Ph.D.
Chairman
Science Advisory Board Mountaintop Mining Panel
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Dear Dr. Patten:

Thank you for your comprehensive review of the U.S. Environmental Protection Agency's draft report "The Effects of Mountaintop Mines and Valley Fills on Aquatic Ecosystems of the Central Appalachian Coalfields." We appreciate your support for our conclusions that there is strong evidence for a causal relationship between mountaintop mines and valley fills, downstream water quality and impaired aquatic communities.

Your guidance enables the EPA to improve the clarity and quality of our draft report and helps us ensure that we are using the best available science in our work to protect the nation's water resources. Following are excerpts of suggestions in your review letter and a summary of our responses.

- The panel suggested some modifications of the conceptual model, placement of the model early in the draft EPA report to serve as an organizing tool for the remainder of the document and use of submodels to highlight different sections.

We added overall conceptual diagrams to serve as a summary of our main conclusions and as an organizing tool for the report. We added specific subdiagrams for each section of the report and incorporated many of the specific edits and revisions recommended by the panel.

- The panel suggested additional literature to improve future drafts of the EPA report.

We bolstered our conclusions by incorporating evidence from the additional references you suggested, especially from the peer-reviewed proceedings of the American Society of Mining and Reclamation.

- The panel believes the draft EPA report's assessment of the impacts regarding the loss of headwater streams should be strengthened by recognizing the importance of the ecosystem services provided by headwater streams and improving the report's discussion of the following issues associated with loss of headwater and forest resources: lack of an estimate of the ultimate area to be affected by mountaintop mines and valley fills over different time frames, lack of an explicit inventory of the diversity of freshwater habitats affected, lack of detail about the loss of biodiversity and the need for improved precision and accuracy in assessing the effects of mountaintop mines and valley fills on ecosystem function.

We expanded our discussion of the biodiversity of the Central Appalachian region and of the ecosystem functions that are expected to be lost with the burial of headwater streams. We made our description of the freshwater habitats more specific, for example, by distinguishing the impacts to ephemeral, intermittent and perennial streams when possible. We noted the need for additional work on estimating the ultimate area to be affected by mountaintop mines and valley fills and on ecological functions of headwater streams.

- The draft EPA report should clarify that total dissolved solids and conductivity are relatively coarse indicators of water quality and that the EPA consider developing a more robust characterization of mountaintop-mining and valley-fills effluents and receiving waters with respect to ionic composition. The panel also cautions the EPA regarding the reliance on acute toxicity tests with non-native surrogate species for inferring consequences of changes in water quality associated with mountaintop-mining and valley-fills activities. In preparation of the draft report, the EPA should conduct a formal threshold response analysis for macroinvertebrates and provide further emphasis on effects of selenium on aquatic organisms, due to the preliminary indications of a risk of effects at higher trophic levels in the aquatic community analysis. The draft EPA report should also further assess the potential effects of mountaintop-mining and valley-fills releases on freshwater mussels, salamanders, crayfish and other aquatic life.

We expanded our discussion of how specific conductivity relates to the concentrations of individual ions. We added caveats to our description of laboratory toxicity tests and emphasized the results of the field observational studies. We also added a section on the transfer and transformation of selenium in food webs and information on mussels, salamanders and other aquatic life. We did not conduct a threshold analysis but included this need in the report's research- and assessment-needs section.

- The panel recommended that the EPA evaluate cumulative impacts for aquatic ecosystems from at least five perspectives: spatial, temporal, river continuum, food web and synergistic. The panel provided details on each of these perspectives and recommended that the EPA use both direct and indirect studies related to mountaintop-mining and valley-fills activities, studies associated with perturbations, which differ from mountaintop mining and valley fills but have similar characteristics, and similar studies that address other issues – selenium and ionic strength, for example.

From a spatial perspective, the EPA added a discussion on conductivity levels downstream from a valley fill and the importance of dilution from tributaries that are not impacted by mountaintop mining and valley fills. We included your descriptions of the different perspectives for cumulative impact assessment in the research- and assessment-needs section and provided your comments to our Office of Federal Activities, which is developing guidance for assessing cumulative impacts. We did not estimate cumulative impacts by analogy to other activities, such as acid mine discharge or urbanization, because of the substantial differences in the proximate stressors – low pH and flow regime changes, for example – generated by these different activities.

- The panel provided suggestions for improving the draft EPA report's characterization of the effectiveness of currently employed restoration methods, including the need to relate current limitations to historic progress, the need to define restoration in the context of improving impacted locations and the need to relate restoration to both on-site reclamation and off-site mitigation.

The EPA clarified the scope of its review to be limited to practices implemented after enactment of the Surface Mining Control and Reclamation Act. We did not offer an opinion on appropriate goals for restoration. We also clarified the scope of restoration goals and activities considered in this report: on-site activities designed to prevent degradation of and/or improve streamflow, water quality and aquatic communities. We agree that the issue of off-site mitigation is one that should be addressed, but, given the breadth of the topic, we highlighted the need for further work in the research- and assessment-needs section.

We at the EPA are committed to using the best available science in fulfilling our mission to protect public health and to safeguard the environment. Please know that we are truly grateful for your independent, critical review and for the expertise and energy you devote to your work.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Lisa P. Jackson', with a large, sweeping flourish at the end.

Lisa P. Jackson



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 17 2011

THE ADMINISTRATOR

Deborah L. Swackhamer, Ph.D.
Chairwoman
Science Advisory Board, 1400F
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Dear Dr. Swackhamer:

Thank you for your comprehensive review of the U.S. Environmental Protection Agency's draft report "The Effects of Mountaintop Mines and Valley Fills on Aquatic Ecosystems of the Central Appalachian Coalfields." We appreciate your support for our conclusions that there is strong evidence for a causal relationship between mountaintop mines and valley fills, downstream water quality and impaired aquatic communities.

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Lisa P. Jackson