

Cumulative Hydrologic Impact Assessment
Quality Assurance \ Quality Control Panel
“CHIA QA\QC”

FINAL REPORT

February 5, 2007

PURPOSE

In accordance with a settlement agreement between the plaintiffs and the state, defendant in Civil Action No. 3:00-0058; Ohio River Valley Environmental Coalition, Inc., et al. v. Stephanie R. Timmermeyer, Secretary for the West Virginia Department of Environmental Protection (DEP), et al. and Green Valley Coal Company et al., Intervenor – Defendants; a quality review panel (Appendix A) was created. This panel was created to review the cumulative hydrologic impact assessments (CHIAs) that the DEP performs and the hydrologic monitoring plans that the agency approves in 12 selected surface mine permits issued after May 5, 2004. This panel is referred to as the CHIA QA\QC Panel.

PANEL MEMBERS

The panel was made up of the following members:

- Chuck Norris, representing the plaintiff
- Jason Bostic, representing the WV Coal Association
- Jack Felbinger, representing the U.S. Office of Surface Mining (OSM)
- George Jenkins and Nick Schaer, representing DEP
- Yvonne Anderson and Mark Holstine, P.E., as panel coordinators

PROCEDURE

The procedures that the CHIA QA\QC Panel followed are summarized from the settlement agreement below:

- Review 12 permits serially, one per month.
- The panel must be comprised of four primary members representing DEP, plaintiff, WV Coal Association, and OSM.
- Formulate written opinions, including majority and dissenting opinions, regarding CHIA compliance.
- The Panel will take on an advisory role for the utilization of trend station data and Environmental Quality Information System data (EQUIS), as well as Watershed Characterization Modeling System (WCMS).
- Each panel member should make recommendations on how to improve the DEP's performance of CHIAs and its evaluation of hydrologic monitoring plans.
- The Panel will operate one year after the initial meeting.

PANEL TIMELINE

A preliminary phone meeting was conducted on November 9, 2004, to discuss panel procedure and protocol and establish the first formal meeting date. The first formal review meeting occurred on January 18, 2005, and these meetings continued once a month and ended with the last formal permit review meeting on December 19, 2005. One permit was reviewed per meeting. The permits reviewed were as follows:

1. Kepler Processing Company O-4006-03
2. Fola Coal Company - Peach Orchard Surface Mine No. 5 S-2013-98
3. Alex Energy - Right Fork Surface Mine, S-3007-02
4. Hampden Coal Company - Lower Cedar Grove Mine No. 2 U-5008-04
5. Hobet Mining, Inc. - Westridge South #1 S-5004-04
6. Delbarton Mining Company - Ruby Energy Deep Mine Complex U-5018-01
7. Oxford Mining Co. S-2003-04
8. Nesco, Inc. - Lane Ridge Run Surface Mine S-2006-04
9. Patriot Mining Inc. - New Hill East Surface Mine S-2010-04
10. Bryant Mining, Inc. - MT5 Surface Mine S-3010-03
11. Marfork Coal Company, Inc. - Horse Creek Eagle Deep Mine U-3001-04
12. Catenary Coal, Inc. - Stockton Deep Mine No. 1 U-3015-03

After compiling the information from each of the review meetings, the panel made a presentation to the Director of the Division of Mining and Reclamation on April 5, 2006 (Appendix B). Each panel member's individual comments were finalized and submitted for inclusion in the final document by mid-October 2006.

DEP'S CHIA GUIDANCE DOCUMENT

On May 5, 2004, DEP drafted a guidance document to provide the building blocks for enhancing the overall CHIA process. This document outlined 11 sections that a CHIA should contain. These sections are:

1. Location/Introduction
2. Geology
3. Hydrologic Concerns
4. Baseline Water Conditions
5. Material Damage Limits
6. Material Damage Potential of the Operation
7. Cumulative Impacts in the Cumulative Impact Area (CIA)
8. Evaluation of the Hydrologic Reclamation Plan
9. Material Damage Finding
10. Bibliography
11. CHIA Map

To simplify the review process, the CHIA QA\QC Panel agreed to base its reviews on this outline so that each individual's comments would be outlined in the same format. This outline was used for the basic format for all of the panel's discussions and findings at each meeting and subsequent report to the director.

PANEL'S GENERAL RECOMMENDATIONS FOR CHIAS

The panel made detailed recommendations regarding CHIA's it reviewed for each permit. These comments were compiled and tracked. The final list of all comments was analyzed to determine what areas were consistently deficient and needed attention. These comments were made based on the above listed sections, but also lead to general recommendations above and beyond the specific sections. The general recommendations are as follows:

- Update the DEP's CHIA Guidance Document
- CHIA writers should follow the guidance document (current version)
- DEP should implement detailed training sessions for CHIA writers and others
- DEP should implement industry training on Probable Hydrologic Consequence\Hydrologic Reclamation Plan (PHC\HRP)
- All data should be submitted to DEP electronically
- DEP should consider re-instituting a CHIA Panel to follow up on recommendations

PANEL RECOMMENDATIONS REGARDING TREND STATION DATA, EQUIS DATA, AND WCMS

The settlement agreement also required the panel to take on an advisory role regarding the utilization of trend station data, EQUIS data, and WCMS. The following are the panel's recommendation regarding these areas:

- DEP should have a working dataset that integrates all of this electronic data into one GIS interface
- DEP should train employees, industry, and the general public on use of this interface
- DEP should consider simplifying the electronic data submission form to encourage electronic data submission by operators
- OSM should consider incorporating WCMS into the TIPS program

PANEL RECOMMENDATIONS SPECIFIC TO THE CHIA GUIDELINE SECTIONS

The panel reviewed each permit and made comments based on the sections outlined in DEP's CHIA Guidance Document dated May 5, 2004. The following is the summary of these recommendations divided into the recommended guidance document sections.

Location\Introduction Recommendations

- A separate and well defined and justified surface water and ground water Cumulative Impact Area (CIA) should be included in each CHIA as defined by the CHIA Guideline
- The verbal definition of the CIA and the CIA boundary shown on the CHIA map or CIA map should agree

Geology Recommendations

- Address all site specific sections of geology and hydrology in the DMM-4 form within both the Probable Hydrologic Consequence (PHC) and CHIA
- Specific attention should be given to materials handling and hydrologic reclamation

Hydrologic Concerns Recommendations

- Ground water – properly identify all site specific groundwater aquifers and their uses
- Surface water – define site specific quantity and quality variations and uses
- Discuss inter-basin transfer of ground and surface waters and any interactions between surface and ground water systems
- Work toward determining methods of calibration for Surface Water Runoff Analysis (SWROA) field conditions

Baseline Water Conditions Recommendations

- Six months of data may not always be enough to determine seasonal variations in quality and quantity of surface and ground water
- Discuss site specific variations in all water quality and quantity data including benthics and heavy metals
- Data used needs to be specific to the CIA being reviewed

Material Damage Limits Recommendations

A consensus was not reached on material damage limits and recommendations to improve the CHIAs. Each panel member will submit their final recommendations on this issue in their individual written opinions.

Material Damage Potential Recommendations

- Discuss material damage potential with respect to ground water and surface water quality and quantity
- A synopsis of the Buffer Zone Analysis and reference to the SWROA calculations should be included with respect to material damage potential

Cumulative Impacts in the CIA Recommendations

- This section of the guidance document should be clarified so the CHIA writer knows what should be included in this section
- Define and justify a surface water and ground water CIA and show this area on a map

Evaluation of the Hydrologic Reclamation Plan (HRP) Recommendations

- This area should be discussed under the material damage potential section of the guidance document
- Revise the guidance document to encourage the CHIA writer to evaluate the HRP instead of simply summarizing it

Material Damage Finding Recommendations

- A material damage finding needs to be clearly stated
- A material damage finding needs to be defined and justified

CHIA Map Recommendations

- Show all adjacent permits within the CIA
- Follow the guidance document

Monitoring Recommendations

- Any referenced water data or sample sites should be located on a map and identified
- Rationale for monitoring plans needs to be included
- Monitoring plans need to include more detail defining the process

INDIVIDUAL COMMENTS

The settlement agreement required that each individual panel member write recommendations as to their interpretations on how to improve the CHIA process. These comments are included, unedited, in the following:

Appendix C: Plaintiff's representative

Appendix D: WV Coal Association's representative

Appendix E: U.S. Office of Surface Mining's representative

Appendix F: DEP's representative

Appendix A
Settlement Agreement

SETTLEMENT AGREEMENT

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USM - CHARLES

This agreement is made between Ohio River Valley Environmental Coalition, Inc. ("OVEC"), Hominy Creek Preservation Association, Inc. ("HCPA"), and Citizens Coal Council ("CCC") (collectively, "Plaintiffs") and Stephanie R. Timmermeyer in her official capacity as Secretary of the West Virginia Department of Environmental Protection ("Secretary Timmermeyer") for the purpose of compromising and settling all claims that remain pending against Secretary Timmermeyer in the action in the United States District Court for the Southern District of West Virginia, which is styled *Ohio River Valley Environmental Coalition, Inc., et al. v. Timmermeyer, et al.*, No. 3:00-00058, as well as Secretary Timmermeyer's liability with respect to any claims Plaintiffs have asserted or could assert against her in the United States District Court for the Southern District of West Virginia or in any other forum for their attorneys fees, costs and expenses in *Ohio River Valley Environmental Coalition, Inc., et al. v. Timmermeyer, et al.*, No. 3:00-00058 or either of the appeals therefrom.

The parties agree as follows:

I.

Establishment and Operation of a Quality Review Panel

1. Establishment of the Panel and Scope of Work

Secretary Timmermeyer agrees to establish a quality review panel to review the cumulative hydrologic impact assessments ("CHIAs") that the West Virginia Department of Environmental Protection performs and the hydrologic monitoring plans that the agency approves in twelve (12) selected surface mine permits that Secretary Timmermeyer issues after the date of this Settlement Agreement. The quality review panel shall review the twelve permits serially, completing work on each selected permit before selection or consideration of the next. Secretary Timmermeyer agrees

that the quality review panel shall also serve in an advisory role for utilization of the recently developed trend station data and EQUIS data and implementing the watershed characterization modeling system (WCMS). The quality review panel shall operate for a period of one year from the date of its initial meeting. Any member of the quality review panel may participate in any of the panel's meetings by telephone conference.

B. Preparation of Written Opinions

The quality review panel shall formulate written opinions (including majority and dissenting opinions where there exists a difference of opinion among panel members) regarding the compliance of each selected CHIA and monitoring plan with all applicable provisions of the approved state surface mining regulatory program for West Virginia. Secretary Timmermeyer agrees to authorize and encourage each member of the review panel to make recommendations on how to improve the agency's performance of CHIA's and evaluation of hydrologic monitoring plans. Written opinions regarding the CHIA and monitoring plans for each selected permit shall be submitted to Secretary Timmermeyer within thirty (30) days from the panel's receipt of the CHIA for review. The panel's written opinions shall be made available to the public immediately after being supplied to Secretary Timmermeyer in accordance with the West Virginia Freedom of Information Act, West Virginia Code §§ 29B-1-1 to -7, as amended.

C. Composition of the Panel

The review panel shall consist of three persons who hold at least a bachelor of science degree in geology, hydrogeology, or similar academic discipline. Plaintiffs shall nominate one member of the panel; the Secretary of the Interior shall nominate one member (who shall be an employee of the Office of Surface Mining Reclamation and Enforcement), Secretary Timmermeyer shall nominate

one member, and Secretary Timmermeyer shall invite the West Virginia Coal Association to nominate one member. In the event that the West Virginia Coal Association accepts this invitation, its nominee shall also be a person who holds at least a bachelor of science degree in geology, hydrogeology, or similar academic discipline for membership, and the panel shall consist of four members.

D. Selection of Permits for Review

Plaintiffs' nominee to the review panel shall have the right to select four (4) of the permits to be reviewed. The members of the quality review panel shall jointly select eight (8) permits for review. The permits Plaintiffs select for review shall be the third, sixth, ninth, and twelfth permits that the panel considers. Each permit selected for review shall have been approved after the date of this order but prior to its selection for review.

E. Compensation of Panel Members

Except for Plaintiffs' nominee, all members of the quality review panel shall be compensated by the party that nominates the member. Secretary Timmermeyer agrees to compensate the Plaintiffs' nominee at the rate of \$265.00 per permit reviewed. Plaintiffs or any entity other than Secretary Timmermeyer may supplement the compensation that Secretary Timmermeyer provides to Plaintiffs' nominee.

F. Administrative Staff

Secretary Timmermeyer shall provide a minimum of one employee to coordinate the administration of the panel. The panel coordinator may attend meetings of the panel to assist in the administration of the panel's activities but shall not participate as a panel member in the review of any CHIA or monitoring plan. At the request of Plaintiffs' nominee, the panel coordinator shall transmit

to Plaintiffs' nominee, without charge, a copy the CHIA, hydrologic monitoring plans, hydrologic baseline data, statement of probable hydrologic consequences, hydrologic reclamation plan, and related maps of any permit the panel may select for review.

II.

Payment of Plaintiffs' Litigation Costs and Expenses

Within seven (7) days after receiving an original of this agreement that has been fully executed by Plaintiffs, Secretary Timmermeyer promises to pay to Charles M. Kincaid, for deposit into his Trust Account and distribution therefrom in accordance with Plaintiffs' direction, the sum of \$42,291.37 which represents the full amount of Plaintiffs' claim for the costs and expenses they incurred in connection with the two interlocutory appeals that Secretary Timmermeyer or her predecessors in office took from orders of the district court in *Ohio River Valley Environmental Coalition, Inc. v. Timmermeyer*, No. 3:00-00058. No part of Secretary Timmermeyer's payment of costs and expenses under this Settlement Agreement is based upon, or meant to compensate Plaintiffs for, time that Plaintiffs' counsel expended or costs that Plaintiffs incurred in formulating or prosecuting their action in the district court. In releasing Secretary Timmermeyer from any liability she might have with respect to Plaintiffs' costs and expenses in connection with formulating or prosecuting their action in the district court and the two appeals, Plaintiffs rely upon their agreement with Secretary Timmermeyer and Secretary of the Interior Gale A. Norton that (a) Plaintiffs are entitled to and eligible for a separate award from Secretary Norton of the costs and expenses, including reasonable attorney and expert witness fees, that Plaintiffs have incurred in formulating and prosecuting their claims against the Secretary of the Interior in this action and (b) nothing in this Settlement Agreement

or Secretary Timmermeyer's payment of Plaintiffs' appellate costs shall impair Plaintiffs' claim for a separate award from Secretary Norton of costs and expenses, including reasonable attorney and expert witness fees, incurred formulating and prosecuting their claims against Secretary Norton in the district court. Notwithstanding Plaintiffs' reliance on the agreements of Secretaries Timmermeyer and Norton, as recited in the foregoing sentence, this Settlement Agreement is not in any way contingent on Plaintiffs' success in either pursuing or obtaining an award of costs and expenses, including reasonable attorneys and expert witnesses fees, from Secretary Norton. By executing this Settlement Agreement, Secretary Timmermeyer states her agreement to the foregoing.

III.

Dismissal of Plaintiffs' Remaining Claims Against Secretary Timmermeyer

Immediately upon payment of the litigation costs and expenses described in Paragraph D above, Plaintiffs and Secretary Timmermeyer shall jointly move the district court to dismiss with prejudice the claims that remain pending against Secretary Timmermeyer in *Ohio River Valley Environmental Coalition, Inc. v. Timmermeyer*, No. 3:00-00058. The joint motion to dismiss with prejudice shall be in the form of the attached Exhibit A. After filing the motion to dismiss with prejudice, the parties agree to expeditiously take any other or further action that is reasonable or necessary to secure the entry of a court order dismissing the claims that remain pending against Secretary Timmermeyer in *Ohio River Valley Environmental Coalition, Inc. v. Timmermeyer*, No. 3:00-00058, with prejudice.

IV.

Enforcement

Secretary Timmermeyer agrees that the non-monetary obligations she assumes by executing this agreement are unique and therefore enforceable by an action for specific performance in any court of competent jurisdiction. Plaintiffs agree that the obligations they assume in Section III of this agreement are unique and therefore enforceable by an action for specific performance in any court of competent jurisdiction. Secretary Timmermeyer's monetary obligations under this agreement shall be enforceable by an action for breach of contract. Nothing in this Settlement Agreement shall be construed as a waiver of the sovereign immunity of the State of West Virginia against the exercise of jurisdiction over it by the federal courts of the United States, as recognized and preserved by the Eleventh Amendment of the United States Constitution. Nothing in this Settlement Agreement shall be construed as a waiver of the limitations that *Ex Parte Young* and the cases following its doctrine impose on the exercise of jurisdiction by the federal courts of the United States over Secretary Timmermeyer and her successors and predecessors. Should Secretary Timmermeyer fail to pay litigation costs in accordance with the provisions of Section II of this agreement, Plaintiffs may, at their sole option, rescind this agreement.

V.

Effect of this Agreement

Nothing herein shall be construed as an admission of liability by Secretary Timmermeyer on any claims the Plaintiffs have made or could make. Neither shall anything herein be construed as an admission by the Plaintiffs that any claims they have made or could make lack merit. The parties have entered into this agreement as a compromise in full, complete and final

settlement of (a) all of the claims the Plaintiffs have made against Secretary Timmermeyer in *Ohio River Valley Environmental Coalition, Inc. v. Timmermeyer*, No. 3:00-00058, that remain pending before the Court and (b) any liability that Secretary Timmermeyer may have with respect to any claims the Plaintiffs have asserted or could assert against Secretary Timmermeyer in the United States District Court for the Southern District of West Virginia or in any other forum for their attorneys fees, costs and expenses in *Ohio River Valley Environmental Coalition, Inc., et al. v. Timmermeyer, et al.*, No. 3:00-00058 or either of the appeals therefrom. Plaintiffs' success, or lack thereof, in either pursuing or obtaining an award of costs and expenses, including reasonable attorneys and expert witnesses fees, from Secretary Norton shall have no effect on this agreement.

The parties agree that neither the dismissal of Plaintiffs' claims against Secretary Timmermeyer nor this Settlement Agreement shall affect in any manner (a) Plaintiffs' right or ability to challenge the lawfulness of acts or omissions by Secretary Timmermeyer or those acting under her authority which occur subsequent to the execution of this Settlement Agreement or (b) Plaintiffs' right or ability to challenge the December 1, 2003, action of the Secretary of the

Interior approving certain amendments to the West Virginia state regulatory program under SMCRA.

Executed this 1st day of March, 2004.

OHIO RIVER VALLEY ENVIRONMENTAL COALITION, INC.

By: *Janet Font*
Its *Co-Director*

HOMINY CREEK PRESERVATION ASSOCIATION, INC.

Wayne Sears
By: *President*
Its

CITIZENS COAL COUNCIL

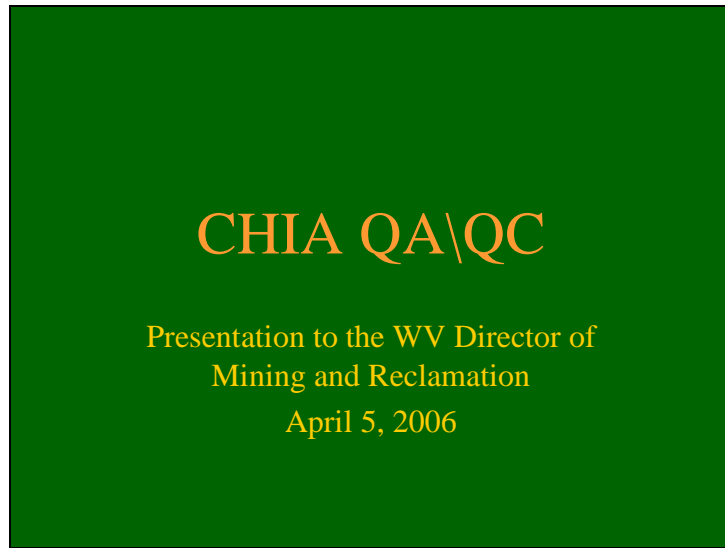
By: *Carolyn Johnson*
Its *Staff Director*

STEPHANIE R. TIMMERMEYER
Secretary, West Virginia Department of Environmental Protection

By: *F. Joseph Parker, Jr.*
F. Joseph Parker, Jr.
Acting Director, Division of Mining and Reclamation

APPENDIX B
Report to Director

Slide 1



CHIA QA\QC

Presentation to the WV Director of
Mining and Reclamation
April 5, 2006

Slide 2



Quality Review Panel

- Formed as a result of Federal Lawsuit, Ohio River Valley Environmental Coalition v. Stephanie R. Timmermeyer and Green Valley Coal.
- Settlement Agreement was reached March 1, 2004 in the Southern District of West Virginia.
- Panel shall include a representative of the Plaintiff, OSM, Coal Association, and WVDEP.

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Panel Members

- Mr. Chuck Norris, representing the Plaintiff.
- Mr. Jason Bostic, representing the WV Coal Association.
- Mr. Jack Felbinger, representing OSM.
- Mr. George Jenkins and Mr. Nick Schaer, representing WVDEP.
- Mrs. Yvonne Anderson and Mr. Mark Holstine as panel coordinators.

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Panel Procedures

- Review 12 permits, over a one year period
- Complete work on each permit before taking up another
- Formulate written opinions regarding compliance of the CHIAs
- Each panel member should make recommendations on how to improve the agency's performance of the CHIAs and evaluation of Hydrologic Reclamation Plans (HRPs)
- Plaintiff's permit selections shall be the third, sixth, ninth, and twelfth permit reviewed.
- All permits reviewed shall have been approved after May 5, 2004
- Advisory role for utilization of trend station data and EQUIS data and WCMS.

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The Year in Review

- Kickoff meeting was held on November 9, 2004 to establish protocol
- Panel met 12 consecutive months starting in January, 2005
- Minutes were prepared for each meeting, and two summary documents were prepared by WVDEP personnel
- Final meeting was held on April 4, 2006 to establish format for final report and presentation.

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CHIA History

- In May 2004, a policy guideline on how to write a CHIA was published as a guidance document
- This document was meant to insure consistency in the writing of all CHIAs statewide
- This policy outlined the major topics that should be covered by a CHIA in outline form
- The Panel used this outline in its review of the CHIAs selected

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CHIA Outline Topics

- Location\Introduction
- Geology
- Hydrologic Concerns
- Baseline Water Conditions
- Material Damage Limits
- Material Damage Potential
- Cumulative Impacts in the CIA\Defining the CIA
- Evaluation of the Hydrologic Reclamation Plan
- Material Damage Finding
- Bibliography
- CHIA Map
- Monitoring was added as a section for review. It is the applicants plan, not part of the CHIA

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Location\Introduction Summary

- CIA needs better definition
- Ground water CIA and surface water CIA should be different
- No description of ground water CIA
- CIA map should identify all permits in the area
- Not enough or improperly located monitoring points
- Two different CIAs were identified

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Location\Introduction Recommendations

- A separate and well defined and justified surface water and ground water CIA should be included in each CHIA as defined by the CHIA Guideline
- The verbal definition of the CIA and the CIA boundary shown on the CHIA map or CIA map should agree

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Geology Summary

- Ground water aquifers were not detailed
- Acid Base Accounting data was not discussed adequately
- Biological issues were not covered
- Topsoil or topsoil substitute information lacking
- Strike and dip not accurate or confusing
- AMD problems are not completely discussed or defined
- Material handling plan is not discussed to determine its effectiveness
- Did not identify users and locations of water wells

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Geology Recommendations

- Address all site specific sections of Geology and Hydrology in the DMM-4 form within both the PHC and CHIA
- Specific attention should be given to materials handling and hydrologic reclamation

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Hydrologic Concerns Summary

- Non-alluvial aquifers were not addressed
- Ground water concerns not listed
- Aquifers not identified
- Potential metals problem not discussed
- SWROA calculations are presently not calibrated
- Surface water flow data not present
- Trend station location not optimal
- Information on AMD prevention not given
- Effect on water quality and quantity not sufficient

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Hydrologic Concerns Recommendations

- Ground water – properly identify all site specific groundwater aquifers and there uses
- Surface water – define site specific quantity and quality variations and uses
- Discuss inter-basin transfer of ground and surface waters and any interactions between surface and ground water systems
- Work toward determining methods of calibration for SWROA field conditions

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Baseline Water Conditions Summary

- Graphs and charts should be included
- Errors in baseline data
- Benthics should be discussed
- No baseline ground water data provided
- No discussion
- No analyses for Ground water Table IV-C metals was included
- No information given on the SWROA
- Sampling sites were not in the same watershed as the proposed mining location

Plaintiff Opinion: Water quality baseline data is technically and scientifically inadequate to characterize seasonal variations in quality and quantity of the ground water and surface water components of the hydrologic balance

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Baseline Water Conditions Recommendations

- Six months of data may not always be enough to determine seasonal variations in quality and quantity of surface and ground water
- Discuss site specific variations in all water quality and quantity data including Benthic and heavy metals
- Data needs to be specific to the CIA being reviewed

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Material Damage Limits Summary

- No limit was given
- Threshold monitoring sites were not designated
- BWQ sites were not included
- There was a specific discussion on what constitutes material damage
- SMCRA and NPDES review often occurs separately, needs to be coordinated
- Title 47 limits should be used to define material damage
- Without a clearly defined CIA, there cannot be a threshold point defined

Dissenting Opinion: No specific discussion of the Rules, too much interpretation of the author

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Material Damage Limits Recommendations

- A consensus was not reached on material damage limits and recommendations to improve the CHIAs. Each panel member will submit their final recommendations on this area in their individual written opinions.

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Material Damage Potential Summary

- Buffer Zone Analysis was not provided or mentioned
- Use of SWROA calculations should be reviewed
- No discussion of surface or ground water quantity\quality
- This section was not included
- No discussion of material damage potential with respect to surface water

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Material Damage Potential Recommendations

- Discuss material damage potential with respect to ground water and surface water quality and quantity
- A synopsis of the Buffer Zone Analysis and reference to the SWROA calculations should be included with respect to Material Damage Potential

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Cumulative Impacts in the CIA\Defining the CIA Summary

- No cumulative impacts listed or defined
- Discussion should cover the abandonment plan of the underground mine
- No distinction in the areas covered for the surface and ground water CIAs
- Discussion of material handling details and results needs to be included
- Definition of the CIA was inadequate

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Cumulative Impacts in the CIA Recommendations

- This section of the guidance document should be clarified so the CHIA writer knows what should be included in this section
- Define and justify a surface water and ground water CIA and show this area on a map

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Evaluation of the Hydrologic Reclamation Plan Summary

- Evaluation not possible due to lack of material damage limits, material damage potential, and no cumulative impacts listed
- Discussion of materials handling plan is inadequate
- This section was not included
- CHIA writers simply re-stated rather than evaluated the HRP

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Evaluation of the Hydrologic Reclamation Plan Recommendations

- This area should be discussed under the Material Damage Potential section of the Guidance document
- Revise the Guidance document to encourage the CHIA writer to evaluate the HRP instead of simply summarizing it

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Material Damage Finding Summary

- This section was not included in the CHIA
- Material damage is not clearly defined in the CHIA

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Material Damage Finding Recommendations

- A material damage finding needs to be clearly stated
- A material damage finding needs to be defined and justified

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CHIA Map Summary

- CIA was outlined but not labeled as the groundwater and surface water CIA
- Trend station locations were not shown
- No CIA area shown
- No threshold or material damage points shown
- Adjacent permits not shown

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CHIA Map Recommendations

- Show all adjacent permits within CIA
- Follow the guidance document

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Monitoring Summary

- Threshold sites were not identified
- During mining monitoring was not discussed
- Ground water and surface water monitoring points should be better defined
- Monitoring plans need to include more detail defining the process

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Monitoring Recommendations

- Any referenced water data or sample sites should be located on a map and identified
- Rationale for monitoring plans needs to be included
- Monitoring plans need to include more detail defining the process

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CHIA Panel General Recommendations

- Update CHIA Guidance Document
- CHIA writers should follow the Guidance Document (current version)
- DEP should implement detailed training sessions for CHIA writers and others
- DEP should implement industry training on PHC\HRP
- All data should be submitted electronically to the DEP
- DEP should consider re-instituting a CHIA Panel to follow up on recommendations

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Comments Regarding Trend Station Data, EQUIS Data, and WCMS

- DEP should have a working data set that integrates all of this electronic data into one GIS interface
- DEP should train employees, industry, and public on use of this interface
- DEP should consider simplifying the electronic data submission form to encourage electronic data submission by operators
- OSM should consider incorporating WCMS into the TIPS program

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General Findings

- DEP is continuing its improvement in CHIA writing
- The State of West Virginia is taking a leadership role in CHIA development and writing
- Despite the number of recommendations contained in this report, it should not lead to an enlargement in the CHIA document but to a more clearly defined and consistently followed Guidance Document

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THANK YOU!

APPENDIX C
Plaintiff's Representative
Comments

Individual Comments and Recommendations

Quality Review Panel for
West Virginia Department of Environmental Protection's
Cumulative Hydrogeologic Impact Assessment and
Permit Section U (Monitoring Plan) for
12 Recently Issued Mining Permits

Submitted by

Panel Member for the Plaintiffs

Charles H. Norris,
Geo-Hydro, Inc.
1928 E. 14th Avenue
Denver CO 80206

Background

The Settlement Agreement among parties to Civil Action 3:00-0058 (OVEC, *et al.* v. Timmermeyer, et al.) in U.S. District Court for Southern West Virginia set up a quality review panel among the litigants. Under the Settlement Agreement, the quality review panel was charged with reviewing 12 recently-issued (issued subsequent to March 1, 2004) West Virginia surface mining permits over a one-year period. The panel was specifically charged in the Settlement Agreement with reviewing the cumulative hydrologic impact assessment (CHIA) produced by the West Virginia Department of Environmental Protection as part of permit approval and the hydrologic monitoring plan (Part U of the SMP application) for the 12 permits. The panel collectively was charged with formulating written opinions (including majority and dissenting opinions) regarding compliance of each CHIA and corresponding hydrologic monitoring plan with applicable provisions of the West Virginia surface mining regulatory program. Individual opinions of each member for each of the 12 permits were submitted monthly during the year-long project. Opinions that were held in common by all members of the panel have been summarized in outline form in a PowerPoint presentation given to West Virginia Department of Environmental Protection mining-program managers in Spring of 2006. This document summarizes conclusions and recommendations by the author that depart in detail, substance, or emphasis from what is shown in the Power Point summary document.

In the course of the 12-permit review program, the panel members evaluated from the reviewed permit applications all parts that provide input to the CHIA and hydrologic monitoring plan, rather than simply the twelve CHIAs and the corresponding hydrologic monitoring plan. The following comments may reflect some of that expanded scope adopted by the panel but not specifically enumerated in the Settlement Agreement.

General Observations

This author is a geologist who specializes in hydrogeology and geochemistry. The following comments address technical issues with the permit applications and not necessarily legal or compliance issues. It is believed, however, that the technical issues that are discussed have directly analogous legal implication to the extent that statutory and regulatory language parallel technical language or common usage.

Cumulative Hydrologic Impact Assessments

Material Damage Criteria

The CHIAs for 11 of the 12 permits that were reviewed failed to define conditions that would constitute material damage for the cumulative impact area for each permit. These CHIAs generally reproduced or paraphrased the regulatory definition for material damage that is found in Section 3.22.e. of the Regulations:

Material damage to the hydrologic balance outside the permit area means any long term or permanent change in the hydrologic balance caused by surface mining operations(s) which has a significant adverse impact on the capability of the affected water resource(s) to support existing conditions and uses.

However, the CHIA authors did not derive from this definition any criteria would constitute material damage for any of the basic resources; ground water quantity, ground water quality, surface water quantity and surface water quality. Similarly, most authors acknowledged the existence of state water quality standards for streams, and some cited those standards specifically. But, they did not confirm that exceedence of those standards would constitute one measure of material damage.

The almost universal failure to define criteria for material damage constitutes a fatal flaw in the CHIAs that the panel reviewed. Section 3.22.e establishes what has been called a use-based definition for material damage. However, a use-based approach for material damage does not eliminate the permit by permit need to determine specific criteria which will define material damage for each cumulative impact area. Regardless of the approach used to define material damage, the CHIA must enumerate specific material damage criteria, *i.e.*, values or ranges of the specific, critical use-based parameters beyond which unallowable impact is deemed to have occurred. Without the quantification of such material damage standards for the permit area, the CHIA writer has no basis with which to compare expected cumulative impacts and thereby competently make the material damage finding that is required of a CHIA.

Arguably, under a use-based approach, determining the material damage criteria for a permit area is even more difficult than an approach that relies strictly on numerical standards. Each permit area will have a unique combination of “existing conditions and uses” which the permit application must competently define. Each cumulative impact area may produce unique meanings to the subjective elements in the regulatory definition. “Long term” may mean different things in different permit areas or in different drainages within a permit area. “Significant,” “adverse impact,” and even “support” likely have different meanings with respect to a warm water fishery than they do where a trout stream is concerned. Without question, “existing conditions and uses” is permit-specific. The flexibility of the West Virginia regulatory definition not only makes the need for permit-specific, competently-determined material damage criteria fundamental, it also expands the breadth and complexity of ensuring that baseline and monitoring data are capable of defining “existing conditions and uses,” thereby enabling regulators to measure pertinent changes due to permit activities.

The author for the CHIA for permit S-2010-04 was the only CHIA author who chose to state conditions or changes in conditions that would constitute material damage. No panel member endorsed the specific criteria that were provided in that CHIA, but at least criteria were defined. (Curiously, the DEP panel member was highly critical of the author for even attempting to quantify material damage criteria.)

Cumulative Impact and Material Damage Finding

Without exception, none of the twelve made a finding of material damage. Most, although not all, had language suggesting a finding of no material damage. Often the “findings” were tentative or conditional in some way or another. In part the ambiguity relates back the failure to establish material damage criteria. If there are no criteria, one can’t definitively state that the criteria will not be exceeded. However, the problem also results from a general failure on the part of the authors to evaluate cumulative impacts. These 12 CHIA generally evaluated the permit applications with respect to their ability to comply with individual permit requirements. Based upon the writer’s acceptance of that likelihood, it was assumed cumulative impacts were acceptable. In no case did a CHIA writer quantify what the impact of the permit would be in cumulation with all other mining in the cumulative impact area. In this sense, the writers seemed to miss the entire purpose of the CHIA. While it may be very worthwhile to use the CHIA as a final check of permit materials, impacts, and discharges, the statutory purpose of the CHIA is to assess the cumulative impact of that permit and all other existing or reasonably anticipated mining operations on all water resources in the cumulative impact area. At the level of a CHIA, the critical task is integrating and quantifying the cumulative impact of the mine with other mining. The CHIA that the panel reviewed fail even to attempt this task.

The general failure to assess cumulative impacts became even more acute with respect to certain individual parameters that competent CHIA must address. One is the impact of a mine on surface water flows. Universally the CHIA writers accepted zero impact in the cumulative impact area from the proposed mine from surface water run-off based upon the SWROA calculations. This is inadequate from several perspectives. First, the SWROA is not evidence of zero impact, even with respect to analyzed rain events. In all cases, the SWROA is a calculation that is made with no calibration and no verification of the assumptions for any of the scenarios that are calculated. There are no data against which to compare the results of the calculation. However, the SWROA evaluates only one design rain event for the drainage system, and this single-magnitude computation does not portray the impacts of the mine under normal conditions. Many of the permits reviewed described spoil handling plans that were acknowledged to “smooth” run-off patterns and make stream flow less flashy and even more stable from season to season. These are not “zero” changes to the cumulative impact areas. They are, however, changes that can impact “existing conditions and uses.” Yet nothing is considered or discussed in the CHIA that the panel reviewed.

A second impact that was not competently addressed in the CHIA was the effect of permitting a new mine in a drainage system that is already affected to the point of impairment. In several cases, the existing impairment was neither noted nor addressed. In such cases, just supporting existing conditions and uses is not sufficient – the mine must result in non-degradation or improvement of the cumulative impact area. The appropriate assessments were simply not made.

Hydrologic Monitoring Plans

The hydrologic monitoring plan of each permit reviewed was incapable of providing any scientifically useful information. To perform any meaningful scientific function, a monitoring plan must establish a network of monitoring sites that are located in time and space in a manner capable of reporting the concentrations of all contaminants of concern at times when they may be present, for as long as they may be a problem. The monitoring plans for these 12 permits do not do that.

The parameters that are monitored should include all mining-related constituents for which there are water quality criteria, including metals. Discharge limits should be better defined. Because DEP has selected a use-based definition of material damage to the hydrologic balance, DEP must require competent and sufficient monitoring of the parameters that are indicative of change or impact the protected uses of each potentially affected water body. The monitoring should be capable of detecting trends toward material damage in the cumulative impact area before material damage occurs, independent of issues related to compliance of the permitted activity, since material damage may occur even if the mine complies with its individual discharge limits.

Methodologies and objectives for analyzing monitoring data were not included in the monitoring plans. These are required parts of the monitoring plans without which the permit applicant cannot demonstrate the plan's adequacy to meet regulatory goals and requirements.

Surface water must be monitored in a way that allows confirmation that the runoff characteristics of the site are consistent and remain consistent with the anticipated runoff, as projected by the SWROA modeling. None of the current monitoring plans does so. Each "surface water runoff monitoring plan" seems to imply occasions where flow monitoring will occur on a daily or more frequent basis, as does the data sheet for section U-3, based upon the parameters listed in U-3 B. However, the monitoring plan never states that such higher frequency monitoring will take place, when it will take place, or for how long it will take place. The only daily monitoring specified in U-3 is that for precipitation. Without the higher frequency data, the SWROA cannot be evaluated or validated.

Specific and enforceable responses must be defined for when limits are exceeded or trends indicative of immanent material damage are seen. These are not found in the monitoring plan. The limits that trigger specific and enforceable responses must be set at levels that allow the prevention of material damage, not that merely recognize it after it has occurred. There are no such triggers.

Baseline Data

Baseline data included with the permit applications were reviewed with other parts of the application that were reviewed by CHIA writers. With each written response and at each meeting, this author made two observations. The first was that the baseline data that were included with the permit application were accepted by DEP as adequate for purposes of issuing the permit. The second was that the baseline data that were included with the permit application are technically and scientifically inadequate to characterize seasonal variations in quality and quantity of the groundwater and surface water components of the hydrologic balance. At no point in any of the discussions did any other panel member express an opposing view to either of these observations, even when invited to do so.

APPENDIX D
WV Coal Association's
Representative Comments

**West Virginia Coal Association
CHIA QA/QC Panel**

Material Damage Limits Recommendations

The West Virginia Coal Association (WVCA) offers the following for consideration by the West Virginia Department of Environmental Protection (WV DEP) regarding material damage limits in the cumulative hydrologic impact assessment of proposed mining operations.

In 2001, WV DEP revised its approved mining and reclamation program, adding a definition of “material damage to the hydrologic balance outside the permit areas”: to mean:

Any long term or permanent change in the hydrologic balance caused by surface mining operation(s) which has a significant adverse impact on the capability of the water resources to support existing conditions and uses (38 CSR 2.3.22.e).

The federal Office of Surface Mining (OSM) subsequently approved this change as being consistent with and more stringent than the corresponding federal surface mining regulations:

There is no federal counterpart to the proposed State definition of “material damage to the hydrologic balance outside of the permit areas.” Nor is there a federal requirement that States develop a definition of material damage. In addition, SMCRA at section 505(b) provides that any State statutory or regulatory provision which is in effect or may become effective after the enactment of SMCRA and that provides for the control and regulation of surface mining operations for which no provision is contained in SMCRA shall not be construed to be inconsistent with SMCRA (68 FR 67035).

In the same federal register notice cited OSM referenced the regulatory history of the cumulative hydrologic impact assessment (CHIA) portions of the federal mining regulatory program that acknowledged the deference granted to individual states:

In a Federal Register notice dated September 26, 1983, OSM addressed comments on the Federal CHIA regulations... OSM concluded that, because gauges for measuring material damage may vary from area to area, and even from operation to operation, the criteria for determining material damage should be left to the States.

Based on existing OSM regulatory structure, WV DEP was fully empowered to enact the definition of material damage as quoted above:

While West Virginia has submitted its definition of material damage for [OSM] approval, that action does not alter the fact that it, like any other State, has the discretion to develop and implement material damage criteria without seeking or awaiting OSM approval of that criteria(68 FR 67035).

Despite OSM's lengthy and referenced review of West Virginia's definition of "material damage", an environmental activist group challenged OSM's approval of West Virginia's definition. A federal district court sided with the plaintiffs and overturned OSM's approval of the "material damage" definition.

OSM has appealed this ruling to U.S. District Court of Appeals for the Fourth Circuit and oral arguments are expected in the case soon.

Based the above cited regulatory history, WVCA would suggest to WV DEP, that notwithstanding the current appeal of the District Court's decision, that it has the full authority to implement the definition of "material damage to the hydrologic balance outside the permit areas" as originally proposed in 2001. WVCA believes the definition as proposed in 2001 provides the best regulatory guidance on this issue for industry, regulators and citizens and that it should be implemented immediately.

APPENDIX E
US Office of Surface
Mining's Representative
Comments

Summary and Recommendations of the CHIA Reviews

**By Jack Felbinger, Hydrologist
Office of Surface Mining
Pittsburgh, PA**

The WVDEP CHIA process has undergone changes in the past 5-6 years to improve permits and CHIA reports. Changes in policy, technical training of employees, establishing an internal CHIA quality review team, technical handbooks, guidelines for writing CHIA reports and litigation have all played a role in this effort. Hopefully, the recommendations made by this CHIA review team will be implemented to help the provide better permits and CHIA reports in the future.

General Recommendations

CHIA Policy Document (Draft 9/11/03)

The CHIA policy document should be updated, clarified and finalized. As part of the update the policy document should include changes resulting from the 'Material Damage/Cumulative Impact' litigation. Many of the CHIA writers did not follow the format of the CHIA policy document. There was also a lack of consistency in the CHIA documents among the CHIA writers and regional offices. Updating, rewriting and clarifying the document would make the document more 'user friendly' than the current document version. The document should be made final rather than in draft form and should be update periodically.

DEP should implement detailed training session for the CHIA writers and the reviewing managers so that a better understanding of what information is required in the CHIA document. The training session should also focus on why the CHIA document is being prepared.

DEP should implement workshops for industry and consultants on the information needs and requirements and the preparation of PHC/HRP sections of permits. The PHC/HRP sections of the permit should have accurate and detailed information and provide the necessary data to properly address the requirements of these sections. The workshops would provide the industry and consultants a better understanding of what is required and the format that DEP wants the information presented. The information disseminated at the workshops would help reduce the number of permit corrections submitted by the company, thus reduce the time needed for permit issuance. The workshops would promote communication and foster the exchange of ideas with industry to improve the DEP permitting process. Hopefully, a trained industry/consultant would provide better quality and more complete data and analyses for the permit.

All data should be submitted electronically to the DEP. The Virginia Department of Mines, Minerals and Energy have successfully implemented electronic submission of permit data. DEP has started a program of electronic submission

of permit data. DEP should encourage industry to always use electronic submission of permit data. The data should be subjected to quality control and then put into the EQUIS database system.

DEP should consider re-instituting a CHIA panel to follow up on the recommendations of this panel. The CHIA panel with a similar composition and format as this panel should be established in about two years. The new panel would review permits and CHIA's to see how the implementations from this panel's recommendations are improving PHC's, HRP's and CHIA's. The review comments from the new panel would be a good check on the consistency, content and the writing of the CHIA's. This would help DEP continue to refine and improve the CHIA process. The panel should consider field reviews and validation of permit impacts as part of the next review.

OSM should volunteer to help train the DEP permit reviewers and managers, industry and consultants. OSM has the National Technical Training Program (NTTP) Permitting Hydrology class and other classes that could be customized for use in training personnel.

Comments Regarding Trend Station Data, EQUIS Data, and WCMS

Some of the reviewers apparently used the available Trend Station Data in the CHIA reports. Funding for the Trend Station Data by OSM was justified with the intent that all permit reviewers would use the data in CHIA reports. From the reviews, it was difficult to tell if anyone used WCMS in the formulating the CHIA reports. The EQUIS Database had very limited data set (the data could be generated by the electronic permitting process) for reviewers use at the time of the reviews. OSM should consider incorporating WCMS into the TIPS program as part of technology transfer to the states and other OSM offices.

Selected Comments and Recommendations

Location/Introduction— The surface water and groundwater CIA's should be written separately (even if they coincide), the CIA's should be well defined and a justification should be provided as to how each CIA was determined. The written description of the CIA and the physical boundary of the CIA shown on the CHIA map should agree.

Geology-- Many of the geology items outlined in the CHIA guidelines were not included in most of the CHIA reports. Acid-Base-Accounting (ABA) data was not discussed adequately in the CHIA reports. The ABA data is a key component used in formulating the material handling plans so the operator will prevent the formation of acid mine drainage (AMD). The material handling plans were not discussed as to why they were effective in preventing AMD. Additional training in acid forming materials and interpreting ABA data is recommended.

Some of the other items omitted from this section included: mining method used and the annual/total tonnage output of the mine; detailed description, location and nature of the groundwater aquifers; distance to public water intake was not provided; no discussion of biological issues were provided and the lack of identifying users and location of groundwater wells. Reviewers need to address these items in the CHIA reports.

Hydrologic Concerns—The Hydrologic Concerns are divided into groundwater and surface water concerns. The inter-basin transfer of groundwater and surface water is a hydrologic concern that needs addressed. One reviewer did address this hydrologic concern. The inter-basin transfer of water may occur in above and below drainage underground mines and in some surface mines using auger and highwall mining methods. Provide reviewers, industry and consultants training/workshops on hydrologic concerns.

Groundwater—Reviewers need to address and properly identify all site specific groundwater aquifers and aquifer uses. The potential metals problems should be discussed. The groundwater concerns should be listed and details provided for each concern or explain in detail why there are no concerns.

Surface Water—A field verification method should be developed by DEP and industry for surface water runoff analysis (SWROA) calculations for flooding to determine the validity of the methods used. A SWROA post-mortem study should be done to accomplish this task.

Baseline Water Conditions—Discussions of seasonal variation of water quantity and water quality for both groundwater and surface water were not provided in the CHIA reports as required.

Groundwater—Little if any groundwater baseline data was provided in the CHIA reports. No water level information was provided. Generally no discussion or analysis of groundwater was presented in the reports.

Surface Water—No analyses or discussion of benthic data was provided in the CHIA reports. Generally there was no discussion of the heavy metals (Table IV-C metals) data.

Material Damage Limits—The material damage limits for most of the CHIA reports refer to Title 46 of the Legislative Rule of the Environmental Quality Board, Series 1, Appendix E lists state in-stream water quality standards. Appendix E of these legislative rules lists state water quality limits for several pollutants or parameters based upon the stream's designated uses. The actual limits were usually not stated in the report.

The CHIA is to include the following material damage statement: “Material damage to the groundwater and surface water users will occur when the quality or quantity of the groundwater and/or surface water becomes significantly altered from the baseline and the intended use for the water is significantly impacted.” This statement does not provide a definition for ‘significantly’. The statement does not explain or define exactly when material damage will or has occurred to the stream or groundwater aquifer. Defined limits or thresholds for parameters would clarify as to when material damage would actually occur.

The Material Damage definition has undergone litigation. Currently the state is required to use the previous definition for ‘cumulative impact’. This definition requires using numerical limits rather than stream use classification limits.

Material Damage Potential— This section was often missing from the CHIA report. A discussion of material damage potential with respect to ground water and surface water quantity and quality should be included in the report. The CHIA writers should include a synopsis of the Buffer Zone Analysis and reference the SWROA calculations.

Cumulative Impacts in the CIA— This section of the guidance document should be clarified as to what is specifically needed for this section. The discussion should also cover the abandonment plans. Usually there were no cumulative impacts listed or defined in the CHIA reports.

Evaluation of the Hydrologic Reclamation Plan (HRP)— The CHIA writer should make an evaluation of the HRP provided by the company and not just restating the HRP in this section. A revision of the guidance document would help clarify this section. This section was not included by the some of the CHIA writers.

Material Damage Finding—The material damage finding needs to be clearly stated, defined and justified. This section was not included by the some of the CHIA writers.

CHIA Map— Based on the guidance document, there were many items that were required but not included on the CHIA maps. The items missing from the map includes all adjacent permits within the CIA (both active and inactive), trend station locations, threshold and material damage points, outline of the CIA’s, and information labels.

Monitoring— A rationale for the monitoring plans should be included. It was observed that some of monitoring points should have been located at a different site location better suited for the intended purpose of monitoring. Threshold sites were not always identified in the monitoring plan. Any referenced water data or sample sites in the CHIA report should be located on a map and identified.

APPENDIX F
WVDEP's Representative
Comments

MEMORANDUM

TO: Whom it may concern

FROM: George Jenkins and Nick Schaer, WVDEP

DATE: 21 August 2006

SUBJECT: 2005 CHIA QA/QC Panel Review

Representatives from the WVDEP, OSM, WV Coal Association and the environmental community reviewed 12 recently approved coal-mining permits in 2005. In particular, the Cumulative Hydrologic Impact Assessment (CHIA) reports were reviewed from each permit application. At the end of this one-year study, the CHIA panel agreed to a set of general findings.

We agree with all the panel's general recommendations, with minor reservations. However, we have several other findings, as follows:

- The CHIA panel's findings will be used to help update the WVDEP/DMR CHIA Guidance Document. Once these updates are approved, the Director of DMR should sign this policy.
- All geologists in DMR need to consistently follow the WVDEP/DMR CHIA Guidance Document.
- The geologists need to insist on accurate, site specific and realistic PHCs and HRPs in the permit applications they review.
- Statewide training for all DMR CHIA writers should be held soon after the approval of the new CHIA policy. This training will emphasize consistent use of the CHIA policy, fully addressing all pertinent rules, regulations and questions on the DMM-4 form. During this training the findings of the CHIA panel will be discussed and emphasized to reviewers.
- Training for mining companies and their consultants on what to put in PHCs, HRPS and how to present data in the permit application is imperative to assure a good permitting product and to decrease the amount of redundant corrections written on a permit application.
- Training/Seminars with certified laboratories needs to be done immediately. Incorrect MDLs, improper handling of cores for overburden testing, etc. is becoming a serious problem, and a source of many detailed corrections on an application.
- Material Damage
 - As required in the law and regulations, material damage should not be allowed at any point downstream of the permit area.
 - Also material damage should be analyzed and prevented on a cumulative level as defined by the CIA.

- EQUIS/WCMS
 - DMR should insist that all water data be submitted to it electronically in a format that is compatible with WCMS. We need to make WCMS an operating tool for the geologists to use in their evaluations.
 - As of Spring 2006 a working prototype GIS interface of all EQUIS data was being tested on the WVDEP test server. We hope have a fully functioning ArcGIS WCMS toolbar to access this data by early 2007.
 - At this time all Trend Station data, all WVDEP Water Resources WAP data and all baseline and during mining water quality data from permits after 1996 are housed in the EQUIS database.

In summary, we generally endorse the comments summary with a few dissents, and feel that the CHIA QA/QC review was productive in identifying areas where DMR's CHIAs can be improved. Although there are still some areas of disagreement among the panel members, a surprising consensus was reached in several areas.