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21 April 2005

Susan Wilson, Executive Director
Citizens Advisory Council
Pennsylvania Department of Environmental Protection
13th Floor, Rachel Carson State Office Building
P.O. Box 8459
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In re: Comments on the Second Act 54 Five-Year Report

Dear Ms. Wilson:

This letter is to provide comments on the report prepared by California University of Pennsylvania entitled "The Effects of Subsidence Resulting from Underground Bituminous Coal Mining on Surface Structures and Features and on Water Resources: Second Act 54 Five-Year Report" (4 February 2005). These comments are provided as a public service and not on behalf of any client. They are based on my professional experience during more than 25 years as a private-sector environmental consultant, during which time I have worked closely with Pennsylvania regulatory programs relating to wetlands, water quality, and mining.

In terms of the *quantity* of information provided, and its overall well-organized format, I believe that this second Act 54 Report represents a great improvement over the first report prepared in 1999, and supplemented during 2001. In terms of providing a lucid insight into the environmental effects of underground mining, and in particular the impacts on wetlands and streams, this second five-year Report, like the first, fails to accomplish the analyses envisioned by Act 54. This failure is not so much the fault of the authors of this Report as it is of the regulatory process as presently administered by the Bureau of Mining and Reclamation (BMR).

My three over-riding concerns are as follows:

- Applicants for longwall mining permits do not collect or provide to PADEP-BMR the baseline information on wetlands and other surface water features that is necessary to evaluate potential or actual impacts, as required by existing laws and regulations, and

- The PADEP-BMR does not insist on receiving the baseline information on wetlands and other surface water features that is necessary to properly evaluate potential or actual impacts, but issues longwall mining permits nevertheless, and

- This second five-year Report does not acknowledge the profound significance of the above shortcomings in the context of Act 54 and in the administration of the BMR's underground mining regulatory program, or give any indication that conditions will improve in the future.

When the amendment to the Bituminous Mine Subsidence and Land Conservation Act (commonly known as Act 54) was passed in 1994, several of the original "purposes" in Section 2 were left unchanged, including:

> "… protection of the health, safety, and general welfare of the people of the Commonwealth … providing for the conservation of surface land areas … aid in the preservation of surface water drainage … and generally to improve the use and enjoyment of such lands …"

The intent clearly was to prevent environmental damage when allowing the underground mining of coal.

A new provision added to the law by the Act 54 amendment was for the compilation and analysis of permit file data, and the reporting of any relevant findings at five-year intervals. The data reviews and analyses were intended to determine "… *the effects of deep mining on subsidence of surface structures and features, and on water resources*…". The implicit assumption is that the permit files would contain the information (including pre-mining baseline inventory and post-mining data and evaluations) that the laws and regulations specifically require. Each permit file <u>should</u> contain a complete inventory, description, and assessment of the surface features and environmental resources associated with that particular longwall mine operation, documenting their condition before mining began and assessing any changes as a result of mining activities. The Act 54 review should primarily compile this information and provide a cumulative assessment of the nature and extent of impacts over a five-year period.

The various sections of this second five-year Act 54 Report repeatedly cite a lack of pre-mining data as the reason for offering either cautiously qualified, or no, evaluation of the effects of longwall mining. Indeed, an entire section (Section III) is devoted to the numerous "limitations" of this study. Commonly, those limitations include a lack of data, or data that are incomplete, inconsistent, or of questionable accuracy. To their credit, the University researchers actually supply new data on streams, a task that they should not have felt compelled to undertake as part of their Act 54 assignment, had they been able to extract the "required" data from the permit files.

The lack and inadequacy of data in the PADEP permit files on pre-mining and post-mining environmental features and conditions makes a mockery of the Act 54 five-year review process. Without adequate baseline data, no credible assessment of impacts can be done. It is that simple. But this is not a

new revelation. I raised this as a concern five years ago (Schmid & Company, Inc. 2000); the problem was evident in the *first* Act 54 report, and was one reason that report was widely criticized; and now it is cited as a continuing problem throughout this second Act 54 Report. It is unconscionable that this continues to be the situation, inasmuch as the PADEP-BMR mining regulations have specifically "required" pre-mining environmental data and inventories for decades. The findings of this Report add further support to what I and others have said over and over for years now – that there has been, and there apparently continues to be, a major disconnect between what the laws and regulations *say* is to be done to protect streams, wetlands, and other aquatic resources, and what *actually is being done* by BMR and permittees in the context of longwall mining.

My specific comments follow. Because my personal expertise focuses on the identification and assessment of wetlands, and with wetland regulatory programs and policies at the Federal, State, and local levels, most of my substantive comments relate to the Report's Section VIII: "Effect of Mining on Wetlands". Following my comments on wetlands, I then address Section VII: "Streams". I conclude with some general comments on the Report overall.

COMMENT 1. In the first several subsections of Section VIII (Wetlands), a brief rationale is attempted for why the NWI (National Wetlands Inventory) was selected as the basis of the Report's evaluation of wetland effects. In VIII.B, the limited time of the study period is noted, as is the fact that the NWI offers a system of mapped and classified wetlands. It then is acknowledged that "some wetlands might not be listed or categorized on the NWI". The average reader, however, will not recognize how great an understatement this last statement is and what its profound implications are for the Report's credibility.

The NWI mapping simply is not an appropriate basis for project-specific wetland inventory or impact assessment. It is most unfortunate that the University researchers apparently do not understand this. The NWI primarily is useful for generalized national or state-level planning, policy-making, and assessments. The NWI also is useful for the assessment and management of migratory waterfowl, which was its original purpose.

The NWI maps are not, and never were intended to be, accurate for regulatory purposes (a note to that effect is displayed on each and every NWI map). The NWI does <u>not</u> claim to identify all wetlands. The NWI mapping in this region was compiled from photo-interpretation of high-altitude color infrared (CIR) aerial photography taken during March 1985. In almost all instances the NWI mapping was not field-verified. Many wetlands were missed because they were obscured by tree canopy; many others were too small to identify from the aerial photographs.

Hydric soils, one of the three mandatory technical parameters that currently are recognized as essential to define regulated wetlands, cannot be determined from aerial photographs, especially in freshwater ecosystems dominated by facultative hydrophytes. Furthermore, wetlands are not relatively static like rock formations; they can and do change over time. Obvious areas such as open water ponds usually are depicted on NWI maps for this region; vegetated, seasonally saturated palustrine wetlands, particularly forested wetlands, often are not.

The Report notes that the NWI mapped 85 wetlands within specific areas proposed to be undermined during the assessment period (73 of which actually were undermined). Nearly 60% of those NWI-mapped wetlands (n=49) were classified as PUB (ponds); another 28% (n=24) were mapped as marshes (PEM); only 14% (n=12) were forested or scrub/shrub wetlands. These data demonstrate the systematic bias of the NWI in favor of the more obvious features that are discernable from high-altitude aerial photography.

During more than 25 years performing wetland delineations, I have found that the NWI maps consistently *under-represent* the actual number and extent of jurisdictional wetlands in a given area. This fact is clearly documented in the Report's discussion of Bailey Mine on page VIII-7, although the implications of the facts presented are not emphasized in the Report.

The Report notes that NWI maps had identified 5 wetlands within the section of the Bailey Mine actively undermined during the 5-year assessment period. Only *three* of those NWI wetlands were actually indicated on the mining maps, however, meaning that the mine operator underreported by 40% the number of NWI-mapped wetlands here from the outset (apparently, the BMR readily accepted the applicant's assertion of existing wetlands without even checking the mine application against the published NWI maps, much less actual field conditions).

Two of the five wetlands mapped by the NWI at the Bailey Mine were in areas above Longwall Panels 8C, 9C, and 10C. The Act 54 Report states that consultants for the mine operator performed a field delineation of wetlands in this same area during January 2000, and identified 24 "jurisdictional" wetlands there. (Presumably no field data were collected, and no regulatory agency confirmed the number or extent of the "delineated" wetlands, so there is no assurance that all wetlands were correctly identified even then.) The permittee's consultants then performed a second delineation in November 2000, and identified seven additional wetlands (total now = 31) and a net increase in wetland acreage of 0.944 acre. This increase in wetland acreage was attributed, not to mining activity, but to natural changes in stream flow/hydroperiod. Thus, to refer to the increase as a "net gain" in the context of mining, as the Report does, is both unsubstantiated and misleading.

The relevance for longwall mining regulation of the brief discussion provided in the Report on a section of the Bailey Mine is not explained, but here is what I conclude from it. The field delineations by the permittee's consultants identified at least 24 (and as many as 31) wetlands in the same area where the NWI had mapped only two wetlands (one of which was a pond). If the consultant's field delineations are correct, the NWI underreported the number of wetlands here by more than 91%. In my experience, this is not unexpected when comparing NWI mapping to actual conditions in forested sections of Pennsylvania. Researchers at Penn State and at Wilkes University likewise have documented that NWI mapping often understates the actual extent of forested wetlands in Pennsylvania (Wardrop 2005; Klemow *et al.* 1996, 1997, 1999). Consequently, use of the NWI mapping as the basis for wetland inventory or assessment for longwall mining regulatory purposes is entirely inappropriate, just as use of NWI maps is inappropriate for determining regulated wetland impacts from any other proposed construction activity throughout the Commonwealth.

It is noteworthy that the Act 54 Report fails to mention that the November 2000 delineation at the Bailey Mine and several follow-up reports (CEC 2000, CME 2001, Pike Environmental Consulting 2000) were undertaken on behalf of the Pennsylvania Coal Association explicitly as an attempt to rebut the conclusions of the report which I prepared for the Raymond Proffitt Foundation (Schmid & Company, Inc. 2000). Neither the coal industry reports nor my report is cited in the "Wetlands" section of the Act 54 Report, which notably has <u>no</u> bibliography at all (unlike the "Streams" section which has 10 listings in its bibliography). Further, the Act 54 Report specifically states that the November 2000 wetland delineation by CEC was performed under *post-mining* conditions for the three panels, and implies (by failing to state otherwise) that the January 2000 effort was a *pre-mining* delineation. In fact, panels 8C and 9C already had been undermined by the time of the January 2000 delineation by CEC, and stream restoration activity had been performed for the 9C and 10C panels by the time of the November 2000 delineation.

Rather than rebut my findings, the conclusions of the CEC and CME reports in fact clearly *validate* two of my basic contentions in the RPF report, which are that 1) mine applicants consistently fail to provide the "required" pre-mining information on wetlands and other surface water resources that would be necessary to make any evaluation of impacts, and 2) the BMR routinely issues permits nevertheless. It is remarkable that this discussion for Bailey Mine is the <u>only</u> mention in the Act 54 Report of any purported field delineation of wetlands performed by anyone during the 5-year assessment period for active longwall mines. Even in this case, no definitive conclusions regarding wetland impacts could be reached because of a lack of pre-mining data.

The main point to be made here is that reliance on NWI mapping as the basis for inventory or environmental assessment of the existing wetlands that inevitably

and unavoidably will be affected by longwall mining is wholly inadequate. This problem is further compounded when the mine operator, as in this instance, identifies only a fraction of the NWI-mapped wetlands on the mine maps, and the BMR consistently fails (or chooses not) to notice.

The fact that the same consultants found a modestly different pattern of wetlands in the same location over a longwall mine during two inventories 11 months apart also is not surprising. The consultants attributed the "increase" in wetland acreage from their first delineation to their second to natural seasonal variations in hydrology (and not to mining activity), which probably is correct; this interpretation strongly suggests that their second field delineation more adequately acknowledged certain areas that should have been classified as wetlands from the outset. Again, from my experience it is not unusual to interpret wetland indicators slightly differently when inspecting the same site under different seasonal conditions. Particularly in light of the fact that the consultant's initial delineation was done in mid-winter (January), which is outside the growing season and is during a time when evidence of many herbaceous plants may be missing, it is not surprising that their November delineation found additional wetlands. An April delineation might have disclosed even more wetlands. The Act 54 Report fails to assess, or even to discuss at all, any changes that may have occurred to the 31 wetlands delineated by CEC in 2000 as a result of subsequent undermining, presumably because there are no data even now on which to base any such discussion.

If a mine applicant is encouraged by BMR to rely on the NWI maps as the basis for "existing" wetlands, or is allowed to ignore even those few wetlands, he may conveniently expect to "find" more wetlands upon conducting an actual post-mining field inspection. Indeed, the Act 54 Report notes many instances where most or all of even the NWI-mapped wetlands are not acknowledged in the permit files (*e.g.,* Enlow Fork Mine: 21 NWI wetlands, none shown on mine maps, no wetland information in permit files; Dilworth Mine: 6 NWI wetlands, none shown on mine maps, no wetland information in permit files; 84 Mine: 15 NWI wetlands, only 6 shown on mine maps; Maple Creek Mine: 12 NWI wetlands, only 5 shown on mine maps; Blacksville No. 2 Mine: 10 NWI wetlands, only 7 shown on a mine map, no wetland information reported in the permit files). These data reinforce the Schmid & Company (2000) findings and confirm that the situation has not improved in five years. Without a formal pre-mining wetland field delineation that has been confirmed in the field by competently trained staff of the PADEP and/or the Corps, neither the Department nor the mine operator has any basis whatsoever for knowing where to look for potential changes due to mining. It should come as no surprise, then, when no impacts are acknowledged.

The lessons to be learned from this situation are: 1) **every wetland inventory must be based on actual field delineations** conducted for the entire permit

area proposed for high-extraction mining – delineations made in accordance with the latest delineation methods and criteria (currently the 1987 Corps of Engineers Manual and supplemental guidance), and 2) **every wetland delineation must be reviewed in the field and approved by the regulatory agency** (Corps and/ or PADEP) prior to its acceptance as part of any longwall mining permit application. This is standard practice elsewhere in the Commonwealth whenever land disturbance activities are proposed in or near wetlands. There is absolutely no reason that longwall mining activities should be treated differently or allowed to destroy wetlands willy-nilly.

COMMENT 2. "Field surveys" reportedly were performed by (unidentified) University researchers (of unknown qualifications) to determine whether mining had any effect on wetlands (Section VIII.D). The current condition of some wetlands reportedly was evaluated on the basis of "visual observations from public roads or utility rights-of-way" (page VIII-2). Wetlands were categorized in one of three ways: "unchanged" (no evident change due to mining, n=59), "altered" (apparently changed due to mining, n=1), and "unknown" (could not be observed without trespassing, n=25). There are several fundamental problems with this peculiar methodology, problems that strongly suggest that the anonymous investigators are unfamiliar with wetland delineation and assessment methodologies in Pennsylvania:

- Existing "wetlands" were defined as those identified by NWI maps (see Comment 1 above regarding why this is inappropriate). Even if the existence of an occasional wetland is correctly identified by the NWI, the scale of NWI mapping is such that its precise location on the ground may be several hundred feet from where it appears to be mapped. Unless precise wetland limits were flagged in the field and surveyed, and their functions and characteristics recorded prior to mining, there is virtually no chance of detecting mine-related alterations after the surface subsidence has occurred.

- *Visual observations* from "nearby" can provide at best only limited information about a wetland's existence, size, or character, and that information most likely will be insufficient. One cannot, for example, determine whether an area has hydric soils without digging a hole at least 12 inches deep with a shovel or soil auger. Likewise, one cannot determine the extent of soil saturation within 12 inches of the surface simply by "visual observation" from afar. Many plant species cannot be identified to species (as is necessary for assigning the appropriate wetland indicator status) without a close examination of their leaves, branches, fruits, and flowers. Depending on the size of a wetland, many of its smaller and more remote plants may not be visible at all from roadways. Actual field investigations of the soils, plants, and hydrology of wetland areas, and not casual visual observations, should have been conducted by researchers qualified to delineate wetlands, and the results should have been recorded on standard data forms, if anyone hoped to be able to analyze wetland changes for this Report or future ones.

- There were no pre-mining data or observations available to use as a basis for evaluation or comparison of putative mining impacts. The sole criterion was whether an area had been identified as a wetland on the NWI maps, and as noted above, that clearly is not determinative. No attempt was made to evaluate any wetland not mapped by NWI.

- The University researchers made their observations during a 5-month study period in 2004, yet the 5-year assessment period was August 1998 through August 2003. Any "effects" observed during 2004 were not contemporaneous with the mining being evaluated. Furthermore, the study period reportedly took place "during a season with higher than normal precipitation" (page VIII-14), and no explanation is provided as to whether or how the field observations were "normalized" to take that into account. High rainfall may obscure the dewatering of a wetland by subsidence.

- No explanation is provided of what constituted "changed" or "apparently altered" conditions. Was it necessary to have observed a gaping crack in the ground to consider an area "altered"? Or to have found all wetland plants dead? Wetland soils and wetland vegetation generally do not change quickly in response to even sudden changes in hydrology. It is common to find that many jurisdictional wetlands are not ponded and do not have saturated soils all (or even most of the) year. Depending on the time of year, it is not uncommon for many regulated wetlands to appear to be "dry" or seasonally lacking in conspicuous hydrophytic herbs, yet many soil characteristics do not change seasonally. Lacking any precise pre-mining data, how did the University researchers determine by casual observation whether an area had altered hydrology?

COMMENT 3. Twenty-one of the 73 wetlands mapped by the NWI (29% of the total) were not evaluated by University researchers because they could not be observed without "trespassing" on posted, private property (page VIII-2). This sensitivity to the rights of the surface owners is admirable, and should be emulated by mine operators. No mention is made, however, as to whether the surface landowners were contacted to *request* permission for access. As a result, nearly one-third of the NWI-mapped wetlands were <u>not</u> evaluated. Given the significant under-representation of actual wetlands by the NWI mapping, only a very small percentage of jurisdictional wetlands, therefore, actually could potentially be evaluated by the researchers. In light of this, and the other shortcomings associated with the methodology employed (as discussed above in Comment 2), there is absolutely no basis for the conclusion of the Report that "wetlands are largely unaffected by longwall mining" (page XIV-2). A more honest conclusion would have been qualified to note that it is based specifically on some of the small subset of wetlands *shown on NWI maps*, in which case it is essentially meaningless and could be omitted altogether. Indeed, the real conclusion is the same as that of my 2000 report, namely that <u>BMR mine permit</u>

files continue to provide no information whatsoever that would allow a credible assessment of the impacts of longwall mining on wetlands.

COMMENT 4. The "Findings" listed in Section VIII.G of the Report are not adequately qualified in terms of the limitations of the study. To say that only "one freshwater pond was lost over the course of the (5-year) assessment period" clearly is overstating the facts. To be more precise: during the brief study period conducted a year after the assessment period ended, one freshwater pond mapped by the NWI was determined to have been drained due to undermining, but it is unknown how many others may have been similarly impacted given the complete absence of baseline data necessary to allow any further conclusion.

Likewise, to state that "one freshwater pond was *gained* over the course of the assessment period" is misleading and goes beyond the Report authors' knowledge. This pond may have existed prior to mining, even though it was not identified on the NWI maps. Even assuming that this pond developed as a result of mining, however, there can be no assurance that it represents a "gain" in wetland resources unless the surface landowner has formally agreed to leave it alone. (Some surface landowners understandably may not appreciate having their backyard, or farmfield, or pasture turned into wetland, especially without their consent and/or some sort of monetary compensation.) The landowner most likely would be inclined to fill it in or drain it, or insist that the mine operator do so, and no State or Federal permit would be required.

The third Report "finding", that neither a large gain nor loss of NWI wetlands occurred, should be qualified by noting that nearly one-third of the NWI-mapped wetlands were not evaluated at all, and that the "evaluation" of the others was minimal at best. It is appropriate that this finding at least does acknowledge that the focus was on *NWI-mapped wetlands* rather than on "all" wetlands.

The Report's final "finding" concerning wetlands is the most significant of all: ***"No regional base-level studies of wetlands served as a benchmark for evaluating wetlands that were undermined during the assessment period."*** In fact, some information about wetlands in southwestern Pennsylvania does exist (a few examples are provided in the "References" at the end of these comments), but for the most part that information is generalized and not mine site-specific. The distressing fact, which this Act 54 Report acknowledges, is that pre-mining delineations of wetlands above longwall panels proposed for mining are not being performed, despite the "requirements" set forth in PADEP regulations.

This "finding" of the Report reiterates one of the main contentions of my 2000 report prepared for the Raymond Proffitt Foundation. Similarly, a memo prepared by the Pennsylvania Game Commission during March 2000, which I had obtained during my review of the Bailey Mine permit files, describes this

situation succinctly: "*DEP concurs with Consol's previous comment that wildlife habitat and wetland documentation, delineation, protection, and/or mitigation has never been made a permit requirement during DEP's review of subsidence control acreage, despite the existence of these items in Module 6.7, 8.6, 18.2, 19.2, and their regulatory requirement under Chapters 89 and 105*" (PGC 2000).

COMMENT 5. Despite the lack of substantive information on wetlands in the main text of the Report, the "Recommendations" listed in Section VIII.H generally are quite good. Several are worth repeating here:

- *Properties to be undermined should be surveyed to identify all NWI wetlands plus wetlands not listed in the NWI* [emphasis added]. This supports the comments that I made above, but its critical significance is almost completely obscured by the focus of this section of the Report on NWI wetlands.

- *All six-month mining maps should show the locations and dimensions of wetlands*. Presumably this means "all" wetlands as identified by pre-mining delineation and field survey. Thorough documentation of the vegetation, soil, and hydrology of each wetland also must be compiled and appended to the mining maps if any impacts on wetlands (or absence of impacts) are to be discernable in the future. Clearly, the mining maps currently lack credible information, as detailed in the Report. As I and others have been pointing out for many years, without detailed and accurate baseline information, no proper evaluation of wetland impacts can ever be done.

- *All information on wetlands should be electronically stored and mapped through GIS software*. This certainly is appropriate, and could allow the development of a database of information, something that is sorely lacking at present (as noted in the last "finding" noted above under Comment 4). If over the years each mine application had contained the pre-mining and post-mining information on wetlands and other surface water resources that the regulations and the mining modules *require*, and if the BMR simply refused to review, much less issue, permits until such information was compiled, there currently would be a significant database upon which the review of new applications could be based to assess likely impacts. It also would enable a more meaningful five-year Act 54 review. Instead, the BMR continues to maintain blissful ignorance of wetlands in the coalfields. Any GIS database, of course, will only be as useful as the detail and accuracy of the data entered into it (*i.e.,* entry of NWI wetland mapping data into a GIS is of little consequence and is inappropriate for wetland inventory).

- *Wetlands should receive more attention than they have been previously given, because they provide habitats for a number of organisms, including migratory birds*. Providing habitat for migratory birds is but one of many important benefits of wetlands to people. The main point here is the most important one: that wetlands should receive the attention and protection that they consistently have

been denied to date in the review of longwall mining permit applications. The reason for this is not a *lack* of laws and regulations, it is a continuing *failure by BMR to implement* those laws and regulations fully and uniformly.

I am pleased to note that many of these recommendations regarding wetlands *appear to* have been incorporated into the latest draft of Technical Guidance Document 563-2000-655 (Surface Water Protection – Underground Bituminous Coal Mining). If that technical guidance is adopted with a little fine-tuning (I have provided detailed comments under separate cover), and if its provisions are applied diligently and consistently, future impacts to wetlands from longwall mining could be identified and minimized. The steadfast refusal to date by BMR to protect wetlands from destruction by longwall mining, however, does not give much reason for optimism.

COMMENTS ON SECTION VII: STREAMS:

1. Dr. Daniel Keogh is the only researcher associated with this entire Report who was identified by name. He is referred to as "the University's representative" and the "University's stream specialist", but no qualifications for Dr. Keogh are provided. He apparently has no direct affiliation with CUP; in a news release issued by CUP on 2 March 2005, and made available on the PADEP website (see Attachment A), Dr. Keogh is mentioned as one of two outside "consultants" used on this project. (The other consultant, Bruce Leavitt, worked for Consolidation Coal Company; his contribution to the Report is nowhere described.) Dr. Keogh apparently did considerable sampling and assessment to ascertain current post-mining conditions in numerous streams in the study area. Unfortunately, as is the case with wetlands, quantitative and qualitative data on the *pre-mining* conditions of many of those streams are incomplete or nonexistent, rendering meaningful conclusions virtually impossible to draw.

2. The bibliography in this section of the Report is notable in that it *exists* at all (no other section has one), but it is rather weak in substance. A handful of stream studies conducted by consultants for Consol, and several USEPA and Ohio EPA reports on stream sampling protocols and criteria, are among the 10 listings in the bibliography. Granted, the failure of applicants to provide, and of the BMR to insist on receiving, pre-mining information on the condition of streams within approved permit areas throughout the coalfields has resulted in a paucity of data for evaluating the impacts of specific mine operations.

A considerable body of literature, however, has been developed in recent years by scientists focused on the effects of underground mining on streams throughout the region. Studies conducted by the US Fish & Wildlife Service, by researchers and students at statewide and local universities (including CUP), and

by other State and Federal resource agencies are not cited in the Report, and likely were not considered in its preparation. A short (and by no means complete) listing of such studies is provided in the "References" at the end of these comments.

3. The "finding" (page VII-56) that flow in many undermined streams eventually recovered without intervention, and that "these streams often had healthier riparian zones", is not at all clear. "Healthier" than what? Than streams that did not recover? Than those same streams had been before being undermined? This should have been explained more thoroughly.

4. Several of the "findings" and the single "recommendation" in the stream section (page VII-57) note that the lack of data on pre-mining conditions makes evaluation of impacts difficult at best. These are the same findings and recommendations that the Report associates with wetlands.

This conclusion should come as no surprise to anyone. I pointed it out five years ago (Schmid & Company, Inc. 2000) following my review of thousands of pages of mine permit files; it was evident in the first Act 54 Report; and it is repeatedly cited as a problem throughout this second Act 54 Report. It is unconscionable that the BMR continues to ignore its legislative mandates.

GENERAL COMMENTS ON THE REPORT

1) One mechanical complaint I have is with the *format* in which this Report was made available. The Report is available online and on CD-ROM, but no paper copies were produced. It is much easier to read a lengthy report like this on paper, so that one can flip back and forth between sections. Also, it is cumbersome to have to view or print out each of the very many separate sections and graphics (and the graphics too often are not readable unless one zooms far in). I suspect that the readership of this report was lower than it would have been, had paper copies been made available. I recommend that the next 5-year Report be made available in paper as well as electronic versions.

2) The Report was prepared for the PADEP by the California University of Pennsylvania Department of Earth Sciences, but no information is provided about the contributing authors/researchers or their qualifications. Page I-3 notes that "specialists" in stream ecology and in wetlands assessed those resources first-hand between 22 March and 28 August 2004. As pointed out above, Dr. Daniel Keogh is cited in Section VII for his involvement in stream sampling and assessment, but no information about his qualifications or his affiliation with the University is provided in the Report. No information at all about any wetland "specialist" is provided, and no other individuals are mentioned by name in connection with other sections of the Report. This is an unnecessary oversight

for a study that claims to be "scientific", "independent", and "objective", and it detracts from the credibility of the Report.

The press release issued by California University of Pennsylvania on 2 March 2005 (see Attachment A), announcing the issuance of the Report, provides some details regarding the CUP students and others involved in the preparation of this Report. That press release was not included with the Report, however, so most readers of the Report would never know who actually prepared it.

3) The Report fails to cite or review relevant literature regarding streams and wetlands, which further detracts from its credibility as a scientific research study. As noted above, a considerable body of literature has been developed during the past ten years or so by scientists and researchers in the public and private sectors whose efforts have focused on the surface water features of southwestern Pennsylvania.

4) I concur with the Report's recommendation (page XIII-1) that the study period for the next Act 54 review commence during the five-year assessment period. Thus, I recommend that work on the third 5-year Act 54 review be initiated immediately. The third assessment period extends from August 2003 to August 2008, so we currently are one-third of the way into it. As the Report authors astutely point out "*The contemporaneous writing of the report would, at the very least, aid in the accurate mapping of features*". **It should not be the responsibility of the Act 54 reviewers, however, to produce the information upon which their evaluation is to be made.** Rather, the Act 54 reviewers should simply be compiling the data that has been made a part of the permit files for each mine, and upon which the BMR relied to make its decision that a permit could be issued because it determined that there would be no significant adverse environmental impacts.

5) One of the general recommendations of the Report (page XIII-1) is for "*… the ongoing acquisition of certain data that were … found to be incomplete, conflicting, confusing, or missing in the electronic file systems or in paper files*." This really is the crux of the problem, particularly with respect to wetlands, streams, and springs. Recommending the "ongoing acquisition of data" means merely that the pre-mining and post-mining inventories and assessments that are supposed to be "required" as part of every permit application should actually be performed. **This lack of comprehensive and accurate baseline information illustrates that the permitting process for longwall mines is a sham: the BMR has consistently issued permits without any technical basis for assessing the likelihood or extent of impacts, in contravention of clear provisions in the laws and in its own regulations.**

6) The upbeat comments of PADEP Secretary McGinty quoted in the CUP press release (Attachment A) suggest that she may not have read the entire

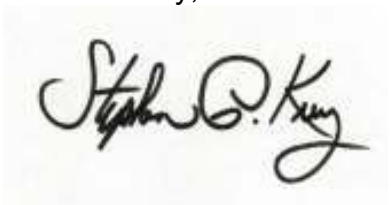
Report, or if she did, that she failed to recognize the systemic problems with the BMR permitting process that this Report exposes. It is most unfortunate that for the second time now, the Act 54 review process has been allowed to perpetrate the myth that the BMR is protecting the environment from the insidious damages being inflicted by longwall mining.

The Pennsylvania Constitution guarantees our citizens the right to clean air, pure water, and the preservation of the natural, scenic, historic, and aesthetic values of the environment. Act 54 was not intended to provide an exemption to longwall mining from this Environmental Rights provision of the Constitution, but to date that is precisely how it has been applied by PADEP-BMR. The lack and inadequacy of data in the BMR permit files regarding pre-mining and post-mining environmental features and conditions undermines the Act 54 five-year review process, and makes a mockery of the regulatory process for longwall mining.

I truly hope that the recommendations of this Report will be taken seriously and incorporated into the permitting process. Unless significant improvements are made in the regulation of longwall mines, there is little chance that the next Act 54 Report will be able to provide any meaningful assessment regarding the level of protection afforded to wetlands and other surface water features in southwestern Pennsylvania.

Thank you for your consideration of these comments.

Yours truly,



Stephen P. Kunz
Senior Ecologist (ESA)

Attachment A: 2 March 2005 CUP press release

cc: Kathleen A. McGinty, PADEP Secretary
PA Joint Conservation Committee
PA Environmental Resources & Energy Committees
PA Coal Caucus
Mike Cummings, Pittsburgh District Corps of Engineers
Donald S. Welsh, USEPA Regional Administrator
George J. Rieger, Division Chief, OSM Harrisburg
Dr. Lawrence L. Moses, California University of Pennsylvania

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ATTACHMENT A: California University of Pennsylvania Press Release, 2 March 2005, as provided on PADEP website "Daily Update"

Cal U Conducts Research and Produces Document on the Effects Underground Bituminous Coal Mining for the DEP

CALIFORNIA, Pa. (March 2) -- An extracurricular activity lasting almost 11 months has proven to be an invaluable learning experience for seven California University of Pennsylvania students. The project also helped the Pennsylvania Department of Environmental Protection (PA DEP) produce a report mandated by law.

Under Act 54, the PA DEP must issue a report every five years on the complex effects of underground mining. This assessment period was August 21, 1998, through August 20, 2003. Various members of the Cal U community and two outside consultants produced this year's report, "The Effects of Subsidence Resulting From Underground Bituminous Coal Mining on Surface Structures and Features and On Water Resources: Second Act 54 Five-Year Report."

Although the PA DEP is responsible for data collection and analysis, it may use the services of professionals or institutions recognized in the field to determine the effects of deep mining on subsidence of surface structures, features and on water resources. In March 2004, the PA DEP and Cal U agreed that the university would fulfill the requirements of Act 54 under Section 18.1 by addressing to the extent possible 43 issues related to mine subsidence for the most recent Act 54 five-year assessment period.

"The report was an objective, scientific study and we were independent in our research, though we turned the report over the DEP and it is their document" explained Dr. Lawrence Moses, chairperson of the department of earth sciences. "It is important to know that mining is going on right now and there are current issues. Our study was an historical one that does not include anything beyond August 20 of 2003. Any recent developments, such as the problems occurring in Fallowfield Township, will appear in the next five-year report."

Environmental Protection Secretary Kathleen A. McGinty lauded Cal U for its research.

"California University has done a commendable job of analyzing a vast amount of information in DEP files and databases and gathering supplemental information needed to assess the effects of underground mining," Secretary McGinty said. "This report offers an independent assessment to DEP and the legislature of how underground bituminous mining affects surface features such as water supplies, streams, wetlands, public infrastructure, homes and other structures."

Earth sciences faculty members involved in the project were Drs. Moses, Donald Conte and Chad Kauffman. Provost Donald Thompson, a former member of the earth sciences department, also contributed, as did former biology faculty member Thad Yorks. Two consultants whose efforts were also instrumental in this project included Bruce Leavitt and Dan Keogh.

Five of the seven student researchers were earth science majors. They included graduate students Michael Ford (Uniontown, Pa.), Robert Ulevich (Washington, DC), Ben Franek (Ginter, Pa.), and undergraduate students David McDermott (Connellsville, Pa.), and Nelson Gunby (Johnstown, Pa.). The two graduate students majoring in biology were Kinley Jesiolowski (Canonsburg, Pa.), and Sabrina Steel (South Park, Pa.).

The report, which was more than 400 pages long, was received by the Legislature, Governor, and Citizens Advisory Council. The complete report is available online at DEP's Web site at www.dep.state.pa.us, Keyword: "Act 54."

"Literally thousands of bits of data had to be considered, and we really accomplished a great deal in a relatively short time," Conte said. "In addition to a paper chase of data, we conducted field observations and studies of wetlands and streams."

According to the executive summary, the report relates types of underground mining methods to surface effects. It categorized effects by longwall mining, which removes large portions of coal seam in panels hundreds of feet wide by thousands of feet long; room-and-pillar-mining, which removes coal but leaves behind pillars or columns of the coal seam for support of the overburden; and full-retreat room-and-pillar mining, which removes the pillars.

During the assessment period, coal operators undermined a total of 37, 458.6 acres in 10 counties. More than 27,000 acres was attributable to longwall mines in Washington and Greene counties. Active mines during the period included nine longwall mines, and 72 combined room-and-pillar mines and full retreat mines. The 10 counties included Armstrong, Beaver, Cambria, Clearfield, Elk, Greene, Indiana, Jefferson, Somerset, and Washington. During the assessment period, underground coal mines operated beneath more than 3,000 properties containing more than 3,600 structures (barn, house). Longwall mines undermined almost 100 miles of stream and almost 80 acres of wetlands in Washington and Greene Counties.

"If there is underground mining, there will be some changes to the surface. If those surface changes impact either water sources or some artificial feature such as a road or house, the law requires that the mine either makes restitution, replaces or restores the water supply, or repairs the impact of the damage," Conte explained.

The watchdog agency that oversees the mines or makes sure that restitution is made is The California District Mining Office (CDMO). The CDMO is both a permitting and regulatory agency that operates under the Bituminous Mine Subsidence and Land Conservation Act and its Act 54 amendments that address active underground coal mining in Pennsylvania's bituminous coal fields and all effects of subsidence.

Conte explained the CDMO's task by using as an example a regional study done by the Cal U group of the near surface groundwater in Washington and Greene counties.

"By agreement with the PA DEP, the California team of researchers examined to the extent possible a wide variety of mining's effects, including the effect of subsidence on near-surface groundwater," Conte said. "Claims had been made that mines were de-watering these two counties but the reality is that about half (340) of those who suffered from the loss of their water supply had that supply replaced by new wells. Now, there is no denying that even the temporary loss of water supply is a very trying hardship. However, that the water was replaced by another well suggests groundwater might have moved, but still lies within the near surface rocks. Also, the precipitation amounts for the period far exceed that amount pumped from mines in the two counties for the period. In some instances the water supply could not be replaced by a new well, so the only alternative for replacement was municipal water, which can both boon and bane. City water can increase rural farm property values, but for those with livestock, reliance on such a water supply might be a hardship. In all cases, the mining company not only has to give a new water supply when it is responsible for the failure of the previous water supply, but it also has to pay operating or maintenance costs."

Conte and Moses concur that while any damage is costly in human emotion and inconvenience, by and large the damage was less than either suspected at the outset of the study.

"We both recognize that for an individual, a loss of water or damage to a house is a personal tragedy," Conte said. "But on the whole if you look at the number of structures that were undermined, proportionately, a relatively small number were actually damaged to a great extent. And proportionately a relatively small number were damaged at all."

"We see a need for studies of natural phenomena before the mining takes place," Moses said. "That allows you to track what changes have actually occurred. It also gives you a trend and analysis of baselines for future studies. You can see the trends over a much greater period of time. So it is not just the information in this report that is important, but what the report represents. It is comprehensive."

Cal U's research for the PA DEP is one of many projects that university professors and students have done with government agencies.

Conte conducted three studies for the Pennsylvania Department of Energy and the United States Environmental Protection agency (US EPA) with Moses assisting on one those studies, including a Greenhouse Gas Inventory for the state of Pennsylvania. The late Dr. Robert Vargo conducted several watershed analyses. Recently the earth sciences department completed a project with Towson University (Maryland) to create a Watershed Mapper for Western Pennsylvania and the department also recently completed an atmospheric analysis for the Department of Energy. In addition to their government research, Conte, Thompson, and Moses are authors of internationally published textbooks on the earth sciences.

Both Conte and Moses lauded Cal U's Peter Daley Geo-Technology Center for providing them with the technological versatility to produce the many graphs, tables, and maps needed in the report.

"We have been involved with work for government agencies many times before and an integral part of this study was having the ability to do a great deal of geographic spatial analysis and GIS research through the Daley Center," Moses said. "I believe two reasons why the PA DEP turned to us to do this study was the fact that California is located in the heart of the mining region and that we have a good reputation among the earth science departments, especially in hydrology."

Conte believes that the report Cal U submitted will have several, long-term positive ramifications. "This is a much more comprehensive study with much more analysis than the first Act 54 Report (1993-1998) produced internally by the PA DEP," said Conte. "This report may act as a template for future reports or it might eliminate the need for certain studies and refine the need for others."

From a Cal U perspective, this yearlong endeavor greatly enhances the participating students' marketability, and supports the university's mission of service to the surrounding communities.

"This was an incredible experience for our students," Moses said. "There is no better learning experience than hands-on work. One student has already gained employment on the strength of his experience, and another has just been awarded a teaching assistantship at the University of Connecticut."

For more information, contact Conte at 724-938-4463, conte@cup.edu, or Moses at 724-938-4180, moses@cup.edu.