

**REPORT OF THE
JOINT SUBCOMMITTEE
STUDYING**

The Effects of Longwall Mining

**TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA**



Senate Document No. 26

**COMMONWEALTH OF VIRGINIA
RICHMOND
1989**

Members of Subcommittee

John C. Buchanan, Chairman

Robert E. Russell

William F. Green

Jack Kennedy

Alson H. Smith, Jr.

Report of the
Joint Subcommittee Studying the Effects of
Longwall Mining
To
The Governor and the General Assembly of Virginia
Richmond, Virginia
January, 1989

TO: Honorable Gerald L. Baliles, Governor of Virginia,
and
The General Assembly of Virginia

I. INTRODUCTION

The 1988 General Assembly adopted SJR 59, which created a joint subcommittee to study the effects of longwall mining. Specifically, the subcommittee was charged with studying "the effects of longwall mining, its beneficial effects such as improved worker safety and increased productivity, its contributions to the Commonwealth's economy, potential adverse effects, and such related matters as the joint subcommittee may deem appropriate."

As part of its study, the joint subcommittee toured an active longwall mining operation in Buchanan County. In addition, the subcommittee received briefings from representatives of the Department of Mines, Minerals and Energy (DMME), reviewed numerous published articles and judicial decisions, conducted site visits in Buchanan and Dickenson Counties to observe the effects of longwall mining on land, surface structures and water resources and held public hearings in those jurisdictions.

The predominant method of underground mining in the Commonwealth has always been room and pillar mining, in which up to fifty percent of the coal in a particular seam may be left in blocks or pillars to support the roof. Sometimes a secondary extraction is practiced where these blocks or pillars are partially or completely removed.

Modern longwall mining methods were imported from England and were first used in the Commonwealth in the 1960's. In that method, through the use of sophisticated mechanical equipment, long, parallel "entries" are developed on the sides of a solid block or "panel" of coal, which may be 400 to 850 feet in width and approximately 5,000 feet in length. Temporary roof support provided by hydraulic jacks permits the total removal of coal from the panel. The jacks advance as a "plough" or cutting equipment slices the coal from the face of the seam. The roof falls into the space behind the jacks when they are moved.

II. THE LAW AND LONGWALL MINING

A. CONSTITUTIONAL, STATUTORY AND REGULATORY REQUIREMENTS

1. The Federal Surface Mining Control and Reclamation Act

In 1977, Congress passed the Surface Mining Control and Reclamation Act (SMACRA), which applies to the surface effects of surface and

underground mining. Virginia assumed primacy of this program in 1981 and is currently administering it under the oversight of the federal Office of Surface Reclamation and Enforcement (OSMRE).

2. Federal Regulations

As initially written and enforced, federal regulations promulgated under SMACRA required coal operators to "restore, repair or replace" land and structures materially damaged by subsidence. However, these regulations were revised due to a federal court decision. Currently, 30 CFR 817.121(c)(1) requires operators to correct "...to the extent technologically and economically feasible," all subsidence-caused material damage to surface lands without regard to state law. Meanwhile, CFR 817.121(c)(2) currently makes operators responsible for correcting material damage to structures or facilities resulting from subsidence only to the extent required by State law. The Federal Register has emphasized that the state law referred to in CFR 817.121(c)(2) is not limited to state surface mining laws, but includes all state laws, whether codified, uncodified, or case law.¹

3. The Constitution of Virginia

A number of sections of the Commonwealth's Constitution are germane to the topic of this study. Article I, Section 11 of the Constitution provides "[t]hat the General Assembly shall not pass any law impairing the obligation of contracts...." Article XI, Section 1 provides "[t]o the end that the people have clean air, pure water, and the use and enjoyment for recreation of adequate public lands, waters, and other natural resources, it shall be the policy of the Commonwealth to conserve, develop and utilize its natural resources, its public lands, and its historical sites and buildings. Further, it shall be the Commonwealth's policy to protect its atmosphere, lands and waters from pollution, impairment or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth."

4. Virginia's Statutory Law

The United States generally follows the English common law rule which, generally stated, provides that when a mineral estate has been severed from the surface estate, the owner of the surface estate has the right to subjacent support of the surface, and the owner of the mineral estate is entitled to remove only as much of the mineral as he can without injury to the surface, unless otherwise waived by deed or contract.² Va. Code § 1-10 states that "the common law of England, in so far as it is not repugnant to the principles of the Bill of Rights and Constitution of this Commonwealth, shall continue in full force within the same, and be the rule of decision, except as altered by the General Assembly."

As previously noted, the Commonwealth assumed primacy over the programs called for by SMACRA when Va. Code §§ 45.1-226 et seq. were enacted. However, the Virginia Code does not specifically refer to "longwall" mining or "subsidence."

5. Virginia Regulations

Regulations adopted by DMME pursuant to Va. Code §§ 45.1-226 et seq. do address the subjects of longwall mining and subsidence. They emphasize the prevention of damage for unplanned subsidence but do not attempt to prevent subsidence. Under Virginia regulations, case operators are required to do the following:

1. Conduct a pre-mining survey to determine the nature of structures and renewable resource lands (farm land or commercial forests) which could conceivably be affected by the proposed underground mining. The purpose of the survey is to determine whether subsidence, if it occurred, could cause material damage or diminished use of the structures or the renewable resource lands. No further action is required if the pre-mining survey does not indicate any surface features which could be damaged.

2. Submit a subsidence control plan. Requirements for this plan depend on the percentage of coal which is planned to be extracted.

- a. For operations where fifty percent or less of the coal will be removed, subsidence generally causes no significant problems. The operator is required to provide information on the mining methods and the plan for development of the underground workings.

- b. For operations with fifty to eighty percent extraction rates, subsidence can occur in various magnitudes and can be delayed for decades. Operators must demonstrate that they will take measures to prevent subsidence and its related damage or will plan subsidence to occur in a predictable and controlled manner. Subsidence can be minimized in these types of mines by leaving pillars of coal in strategic locations or by back stowing mined-out areas. Material damage can be controlled by reinforcing or relocating structures and by monitoring surface changes to determine if other measures need to be taken.

- c. For operations with extraction rates between eighty and one hundred percent, subsidence usually occurs immediately after mining and typically concludes within six months of extraction. The law allows for the occurrence of planned subsidence in a predictable and controlled manner.

3. Provide special protection for certain types of buildings and surface features, including public buildings, perennial streams, or impoundments with a storage volume of twenty acre-feet or more. Mining cannot take place underneath or adjacent to these features unless the Division of Mined Land Reclamation (DMLR), on the basis of detailed subsurface information, determines that subsidence will not cause material damage.

4. Notify residents prior to mining underneath their homes. According to DMME, DMLR also evaluates the likely effects of a mining operation on ground and surface waters during its review of every permit operation. If the evidence indicates that a particular mine would cause a negative and permanent effect on the "cumulative hydrologic balance," then DMLR could require that certain actions be taken by the operator. DMLR also has the authority to suspend mining activity in urbanized areas if continued mining presents an imminent danger.

Unlike surface mine operators who are required by federal and state law to replace water supplies damaged by their operation, underground mining operators face no similar replacement requirements. However, where a duty of subjacent support exists, underground coal operators may be held liable for the destruction of surface waters if such destruction results from a failure to support the surface properly. Where underground coal operators have maintained sufficient surface support and surface waters are damaged, there is no liability.

B. CASE LAW REGARDING SUBSIDENCE AND SUBJACENT SUPPORT

1. The United States Supreme Court

Under Pennsylvania's Subsidence Act of 1966, that state required that at least fifty percent of the coal be left beneath certain structures and cemeteries for support purposes. The Supreme Court, in Keystone Bituminous Coal Association v. DeBenedictus, et al. 107 S Ct 1232 (1987), affirmed the ruling that this Act did not effect a taking of private property without compensation and that the impairment of private contracts effectuated by the Act was justified under the state's police powers to protect the health, safety and general welfare of the public.

2. Virginia Case Law

The presiding case law regarding subsidence damage in Virginia is found in Stonegap Colliery Co. v. Hamilton, 119 Va. 271 (1916). In that case, the court stated that if the surface owner "desires to reserve rights inconsistent with the full enjoyment of the surface, it is his duty to reserve those rights by clear and unequivocal language." Without such a waiver, the law therefore requires that the person with rights to be undermining coal must leave enough support so as not to interfere with the landowner's enjoyment of the surface or be held liable for damages sustained. The court stated "[w]here one grants the minerals under the surface with the privilege of mining such materials, the support of the surface is a part of the estate reserved in the grantor; while on the other hand if one sells the surface reserving the minerals, the grantor in removing the minerals reserved, must leave or provide sufficient support for the surface to prevent its subsidence, unless, in either case, there is some additional statutory or unequivocal contract authority therefor." The court went on to state "it is well settled that the grant of the surface with a reservation of the minerals and the right to extract the same does not permit the destruction of the surface, unless the right to do so has been expressed in terms so plain as to admit of no doubt." Therefore, although no specific words are necessary to show a surrender of subjacent

support, the presumption is in favor of such support and should not be taken away by mere implication. The court also indicated that the word "surface" meant not merely the geometrical superficies without thickness, but included whatever earth, soil or land is above and superincumbent upon the mine.

In another case, the Virginia Supreme Court discussed the weight to be accorded by courts to the circumstances surrounding the execution of a deed. Phipps v. Leftwich, 216 Va. 706 (1976) dealt with the interpretation of a 1902 "broad form deed" which granted:

"...all the coal... in, on and under the hereinafter described tract of land" and the right "to enter upon the said tract of land and use and operate the same and the surface thereof free from further costs or damage in all or any manner that may be deemed necessary or convenient for mining, preparing for market and removing therefrom or otherwise utilizing all or any of the said coal or minerals... without liability for injury to the surface of said land or anything thereon or thereunder by reason of the mining, manufacture or removal of said coal... or by reason of diverting, confining or using the water or waterways on said property; for all which the party of the second part ... is hereby released from liability...."

The court stated that "the fundamental rule of construction in Virginia is that the purpose and intent of a written instrument is to be determined from the language used in the light of circumstances under which it is written..." and "[t]he intent of the parties to a deed is paramount and must be determined by construing the instrument as of the date and under the circumstances of its execution..." In enjoining the coal operator from mining coal on the tract in question through any form of surface mining, the Court stated "[t]here is uncontroverted evidence that strip mining was unknown in Dickenson County in 1902 and that the only method of mining then recognized was underground mining, such as shaft, deep or drift mining. Thus,... the broad language of the deed is applicable only to underground mining."

III. BENEFITS, COSTS AND COMPENSATION

A. ECONOMIC EFFECTS

The Virginia Division of Mines reported that of the 45,537,960 tons of coal mined during 1987 in the Commonwealth, 8,317,454 tons or approximately eighteen percent of the total production was mined through the use of the longwall method. This represents a large increase since 1982, when only 1.1 million tons were produced through the longwall method of mining. An additional five million tons of coal was mined by conventional methods in longwall mines in preparation for utilization of longwall machinery.

Testimony indicated that longwall mining is very important to southwest Virginia's economy.³ According to the Virginia Center for Coal and Energy Research's figures, 2,615 persons were employed in longwall mining activities in Virginia in 1987, accounting for a payroll of \$67 million, coal sales of \$324 million and in excess of \$15 million in state and local taxes.⁴ For example, Island Creek Coal Company's five longwall

mines in Buchanan County account for the largest payroll in that county: \$46 million. Consolidated Coal Company's longwall mine in Buchanan County constitutes a \$2.5 million tax base for that locality.

The Virginia Center for Coal and Energy Research indicates that coal in deep seams is difficult and costly to mine using conventional machinery.⁵ Longwall equipment makes it possible to safely and profitably mine such seams. The shields above miners working at the face with longwall equipment protect them from injuries caused by roof falls. As many of the shallower coal seams in the Commonwealth have already been mined, testimony indicated that coal operators in the future will be forced to rely on the longwall method of mining in order to remain competitive in the world market.

Coal miners were especially cognizant of the economic importance of longwall mining. Many testified that the longwall method of mining had saved jobs, rather than caused unemployment. Testimony indicated that numerous employees were required in order to develop longwall panels and to support the longwall operation with transportation, supplies, ventilation, maintenance and other activities. Even persons most disturbed by the adverse effects of longwall mining were generally of the opinion that some solution to the problems should be found short of abolishing the longwall industry, especially if a method could be found to ensure protection of surface property owner's rights.

B. ADVERSE EFFECTS

When coal is removed from an underground seam, tension and compression stresses acting on overlying strata result in horizontal and vertical movements of rock and soil, extending beyond the material immediately above the excavation to a surface point that defines "the angle of draw." The angle of draw in Appalachian coalfields is estimated to vary between twenty to thirty-five degrees.⁶ Mining-induced surface displacements are said to be predictable with considerable accuracy, although prediction of damages to structures caused by such displacements is much more complicated.⁷ Fractures and deformities of strata and the surface depend on many factors, including the depth and thickness of the coal seam mined, the geologic characteristics of the overburden, and the dimensions of the area mined. Up to a certain "critical point," subsidence increases as the width of the panel increases. In general, the deeper the seam that is mined, the less subsidence is experienced, but the wider the affected surface area.

In room and pillar mining where relatively large pillars are left and coal extraction ratios are low, surface subsidence may be negligible. When a very high percentage of coal is extracted, such as when coal pillars are removed, final surface movements may approach those associated with longwall mining.⁸ Several experts testified that subsidence related to longwall mining is generally complete within a few months following cessation of active mining.⁹ Other individuals testified that subsidence may go on for years, especially when longwall panels are sequentially mined side by side.¹⁰

In order to minimize subsidence damages, Dr. Michael Karmis, head of the Department of Mining, Minerals and Engineering of Virginia Polytechnic Institute and State University and a recognized expert on subsidence,

suggested the following, while cautioning that excessive use of such measures might render longwall mining uneconomical:

1. The prediction of surface subsidence;
2. Not mining the resources in certain areas;
3. Using special mine designs; and
4. Applying precautionary and preventive measures to surface features.¹¹

For purposes of this report, the injurious effects of longwall mining which result from the previously described horizontal and vertical movements of rock and soil will be discussed under the following five separate but often overlapping headings.

1. Land Surface Alterations

During its site visits in Buchanan and Dickenson Counties, the subcommittee observed a number of damages to the surface of the land which were allegedly caused by mining. These damages included irregular depressions or troughs in a lawn, thin surface breaks extending across a cemetery, a thin break in a paved secondary road, bubbles of gas issuing from the surface of a stream and said to be due to fractures or increased permeability of underlying strata, disrupted water lines and septic tanks, and swimming pools and ponds with cracks which prevented them from being able to hold water. A major concern of those who testified in regards to these effects was the possibility of groundwater contamination, whether by methane gas or other pollutants.¹²

2. Damage to Buildings

Many of the homes visited by the subcommittee in Dickenson and Buchanan Counties presented conspicuous masonry cracks in their foundations, walls, fireplaces and garages. Windows and doors in many of these homes were out of alignment and would not open or close. Some of the homes visited had floors which bulged or sagged, roofs or basements which leaked and wall/ceiling junctions which were disrupted. One home's basement was encumbered with eighteen jacks in an effort to stabilize the structure. Cracks in the floors and walls of a church were observed as well. Testimony alleged that two schools in the communities visited by the subcommittee had suffered structural damage but had been rehabilitated. Other testimony alleged that two homes had been destroyed by explosives and fires due to methane gas which was believed to have been released from the earth through fractured strata.

Several geologists explained that the "booms" or shock waves experienced by residents occurred due to slippage of strata at fractures as the earth adjusted above the mine roof.¹³ Testimony alleged that seismographs placed in the area recorded over 2500 "events" in two years, some reaching a magnitude of 3.9 on the Richter scale. One geologist reported that he had been able to correlate seismographic waves with "booms" or vibrations felt by residents near longwall mines.¹⁴ Testimony alleged that some of the vibrations felt in Buchanan County were strong enough to be recorded ninety miles away. Similar phenomena occurring in Germany have been described as "miniature earthquakes" caused by coal mining.¹⁵

Testimony indicated that there was support for the idea of creating buffer zones around certain protected classes of structures or sites. An industry official indicated that some sites on the surface could be protected by designing the mine at the planning stage so that the site to be protected would fall between two panels, but that excessive areas of protection might make the mining economically unfeasible.¹⁶

3. Hydrologic Impacts Related to Subsidence

A spokesman for the Virginia Coal and Energy Research Center has stated that the hydrologic impact related to subsidence may pose the greatest long-term concern of longwall and other underground mining.¹⁷ Some witnesses believed that drought has contributed to the problem.¹⁸ Testimony of one witness alleged that of seventy-two Dickenson County families affected by one longwall mine, twelve had experienced a well or spring on their property going dry.¹⁹ Residents of the Dry Fork section of Buchanan County complained of methane gas in their water wells which made the wells unusable because of the water's rotten egg odor.²⁰ One geologist described his use of a down-hole camera in abandoned water and gas wells in Buchanan County, explaining that he had observed progressive distortions and blockages at different levels of the well which were caused by shifting strata.²¹

A 1978 Virginia State Water Control Board publication reported that "[t]he loss of groundwater due to mining threatens to become Buchanan County's most serious problem. Collapse of mine roofs send fractures upward and slightly outward through the rock beds. Assuming that present trends continue, the total groundwater supply will fall short of the County's needs, probably by the year 2000."²²

The Director of the Virginia Water Resources Research Center recently stated that deficits in the groundwater resources are projected to occur in the near future in the coal producing area; in particular, "the localities of Buchanan, Grundy, Jonesville, Rose Hill, Appalachia and Pound are among those estimated to require additional development of their groundwater resources... . Coal and mineral mining in the area have affected the water quality in many areas of the district."²³

Results of a recent study conducted by the United States Bureau of Mines showed that deep aquifers over the center of a Pennsylvania longwall operation had a precipitous decline in water level as the mine's working face came within 500 feet of the aquifer.²⁴ A 150 foot well went dry two months after the face passed underneath it and exhibited only slight recovery a year later. Wells tested beyond 500 feet, or outside the twenty four degree angle of draw, showed no detectable change resulting from the mining activity. Studies regarding the hydrologic effects of room and pillar mining, as well as the effects of longwall mining, have apparently not been extensively reported.

The Virginia Department of Game and Inland Fisheries, while unaware of such problems in Virginia, upon the basis of past problems experienced in other states, is concerned about the potential capture of streams due to surface fractures caused by longwall mining.²⁵ The Department also expressed concern about the effects subsidence might have on fish habitat were changes in stream flow or stream bank erosion to occur.

4. Effects on Population and Tax Base

Some of those persons who testified at the public hearing expressed concern about their communities' population and tax bases. Although no official statistics were available, they indicated that local population is declining as residents desert their damaged homes. One witness listed thirty-three families who had or were in the process of moving away from the vicinity of one Dickenson County mine, twenty-six others had accepted payment for damage releases and thirteen families were still negotiating with the mining company concerning damages to their property.²⁶ Concern was expressed about the effect this exodus would have on the community's tax base.²⁷ Many of those who testified believed that those individuals who moved away from the community would not be replaced, because people are reluctant to move into a house or community which has suffered damage from subsidence caused by longwall mining. They also worry that subsidence damage will deter new businesses from locating in the affected communities, and that the procurement of bank loans and insurance will become more difficult.

5. Psychological Trauma and Impairment of the Quality of Life

In addition to the anxiety about longwall mining's effects upon public water supplies, outdoor recreation and public transportation, one person referred to the anguish and heartbreak associated with the disruption of residents' home lives by stating "the deepest scars are to the lives, not the land."²⁸ Residents in areas affected by subsidence complained of being "jostled by workmen shoring up sagging basement joists" and of being "reduced to dependency on bottled water." Others complained of being awakened at night by "booms," indicating that they were fearful for the safety of their families. Though not denying the economic importance of coal, they felt it unfair that they were forced to haggle over compensation after, rather than before they were denied the quiet enjoyment of their homes.²⁹

C. INDUSTRIES' COMPLAINT RESPONSES

With regard to complaints of damages caused by subsidence, the Virginia Coal Association, although it believes the current legal system adequately protects the rights of all parties, encourages its members to respond expeditiously to surface owner complaints and to implement voluntary programs for the fair resolution of claims.³⁰

The subcommittee received a brief statement from a number of coal mining companies regarding their damage compensation policies. Island Creek Coal Company's policy is one of paying for damages once they determine that their mining was the cause.³¹ Their policy has facilitated the settlement of fifty-five percent of their 300 damage claims. Island Creek has modified some of its mining procedures to prevent the occurrence of tremors and "bumps" felt by surface owners. A water truck was purchased by the company to serve residents who had lost water supplies while other residents were hooked up to public water supplies.³² Island Creek does not pay the water bill for residents who are hooked-up to public water. The company indicated that it performs premining surveys and consults personally with property owners reporting their findings. Claims are handled by Island Creek on a case-by-case basis.

Consolidation Coal Company's policy is based on the presumption that the company has "the right to mine the coal."³³ The company offers a program of repair or compensation for structural damage and tries "to provide a replacement for lost water resources." Their program attempts "to minimize the emotional aspect by communication."

Westmoreland Coal Company indicated that it had established a subsidence policy, but believed that additional laws were unnecessary.³⁴

Pittston (Clinchfield) denies that it is "running roughshod over homeowners."³⁵ Since inauguration of its voluntary compensation policy in 1985, the company estimates that it has attempted to negotiate settlements concerning over 100 properties and has settled approximately ninety-five percent of its claims. Pittston's policy provides for the repair of damaged properties and for the purchase of severely damaged properties.

IV. A SUMMARY OF THE SUBCOMMITTEE'S FINDINGS

Longwall mining is a significant element in the economy of Southwest Virginia, providing safe employment for area citizens, tax revenues for state and local government and a competitive status for Virginia coal.

Associated with longwall mining are serious costs, often including damage to water resources, structures and land surfaces, potential shrinkage of local real estate tax bases, and the impairment of the quality of life and the quiet enjoyment of private property.

All high-extraction methods of mining impair or destroy subjacent and lateral support.

Although most companies have damage compensation policies, uniformity is lacking. Companies insist that they have the right to mine the coal. Landowners feel that they have the right to subjacent support and that mining which removes this support should not be performed without their prior approval.

Litigation involving certain issues related to property rights of mineral and surface owners is now pending before Virginia courts.

V. RECOMMENDATIONS

1. That the premining survey, in the case of high-extraction mining, include an inventory of all structures, water resources and other surface property at risk of damage by such mining, and include also the premining condition of such items.
2. That the requirement for an operations plan, subsidence plan and reclamation plan apply to high-extraction methods of underground mining.
3. That special provisions be included in the operations plans for mining in proximity to public buildings and facilities, cemeteries, churches and water resources for the prevention or mitigation of damages to such objects.

4. That all high-extraction mining be accompanied by appropriate monitoring procedures to ensure early detection of imminent damage to land surfaces and surface objects.

5. That legislation on any issue that might be affected by pending litigation be deferred until such issue has been resolved by the Courts.

Respectfully submitted,

John C. Buchanan, Chairman

Footnotes

¹ The Federal Register, Tuesday, February 17, 1987; Part V, Dept. of the Interior, OSMRE, 30 CFR 784-817 . . . Final Rule.

² M. Karmis et al., Minerals and the Environment, Vol. 4, No. 4, December, 1982, p. 126. See also Temple Law Quarterly, Vol. 25, No. 1, p. 1, 1951. (Hugh H. Montgomery) See also H. M. Ingram, Eastern Mineral Law Institute, Chap. 6, p. 3.

³ Tommy Hudson, President, Va. Coal Association; testimony at public hearing, Grundy, Va., August 30, 1988. Ken Price, Gen. Mgr., Va. Division of Island Creek Coal Co.; testimony at public hearing, Grundy, Va., August 30, 1988. Gary Slagel, Director, Environmental Regulatory Activities, Consolidation Coal Co.; testimony at public hearing, Grundy, Va., August 30, 1988. Barbara Altizer, President, Va. Coal Council; testimony at public hearing, Grundy, Va., August 30, 1988. Gene Mathis, President, Pittston Coal Group; testimony at public hearing, Clintwood, Va., August 31, 1988. Robert L. Brendlinger, Chief Engineer, Jewel Smokeless Coal Corp.; testimony at public hearing, Grundy, Va., August 30, 1988. Larry Jackson, V. P., Engr., Westmoreland Coal Co.; statement presented at public hearing, Clintwood, Va., August 31, 1988. Jerry McPhee, Dir. of Gov't. Relations, Island Creek Coal Co.; testimony at public hearing, Grundy, Va., August 30, 1988.

⁴ Virginia Center for Coal and Energy Research, Energy Scout, Vol. VIII, No. V, September/October, 1988.

⁵ Virginia Center for Coal and Energy Research, Energy Scout, Vol. VIII, No. V, September/October, 1988.

⁶ Michael Karmis, professor and Dept. Head, Dept. of Mining and Minerals Engineering, VPI & SU; testimony at public hearing, Grundy, Va., August 30, 1988.

⁷ Michael Karmis, professor and Dept. Head, Dept. of Mining and Minerals Engineering, VPI & SU; testimony at public hearing, Grundy, Va., August 30, 1988. Gary Slagel, Director, Environmental Regulatory Activities, Consolidation Coal Co.; testimony at public hearing, Grundy, Va., August 30, 1988.

⁸ Michael Karmis, professor and Dept. Head, Dept. of Mining and Minerals Engineering, VPI & SU; testimony at public hearing, Grundy, Va., August 30, 1988.

⁹ Michael Karmis, professor and Dept. Head, Dept. of Mining and Minerals Engineering, VPI & SU; testimony at public hearing, Grundy, Va., August 30, 1988. Hunt and Jones, Subsidence Regulation under the SMCRA of 1977, Journal of Mineral Law and Policy, Vol. 2:63, 1986-87.

¹⁰ Gerald Gray, Esq., testimony at public hearing, Clintwood, Va., August 31, 1988. U. of Ill., Engr. Exp. Station Bulletin No. 91, p. 114, August, 1916.

¹¹ Michael Karmis, Professor and Dept. Head, Dept. of Mining and Minerals Engineering, VPI & SU; testimony at public hearing, Grundy, Va., August 30, 1988.

¹² Barney Reilly, President, Dickenson County Citizens Committee; testimony at public hearing, Clintwood, Va., August 31, 1988.

¹³ Hans Nahlman, Geologist of Geological Consulting Services; testimony at public hearing, Grundy, Va., August 30, 1988. William Messer, geologist consultant; testimony at public hearing, Grundy, Va., August 30, 1988. Charles S. Bartlett, Ph.D., consulting geologist; testimony at public hearing, Grundy, Va., August 30, 1988.

¹⁴ Charles S. Bartlett, Ph.D., consulting geologist; testimony at public hearing, Grundy, Va., August 30, 1988.

¹⁵ Letter from William R. Walker, Director, Va. Water Resources Research Center, VPI & SU, Jan. 10, 1989.

¹⁶ Gene Mathis, President, Pittston Coal Group; testimony at public hearing, Clintwood, Va., August 31, 1988.

¹⁷ John Randolph, Director, Va. Center for Coal and Energy Research, VPI & SU; testimony at public hearing, Grundy, Va., August 30, 1988.

¹⁸ Hoyt Williams, engineer, Thompson & Litton Co.

¹⁹ Barney Reilly, President, Dickenson County Citizens Committee; testimony at public hearing, Clintwood, Va., August 31, 1988.

²⁰ Peggy Van Dyke, homeowner in Dry Fork community near Vansant, Va., Buchanan County; testimony at public hearing, Grundy, Va., August 30, 1988.

²¹ William Messer, geologist consultant; testimony at public hearing, Grundy, Va., August 30, 1988.

²² Susan R. Epps, Va. State Water Control Board Planning Bulletin No. 311, 1978.

²³ Tommy Hudson, President, Va. Coal Association; testimony at public hearing, Grundy, Va., August 30, 1988.

²⁴ Pennington, et al., Bureau of Mines, OFR 142-84, May, 1984. Moebs & Barton, Bureau of Mines Info. Circular 9042, pp. 13-24, 1985.

²⁵ U. of Ill., Engr. Exp. Station Bulletin No. 91, pp. 19-20, August, 1916. David Whitehurst, Department of Game and Inland Fisheries; testimony at public hearing, Clintwood, Va., August 31, 1988.

²⁶ Barney Reilly, President, Dickenson County Citizens Committee; testimony at public hearing, Clintwood, Va., August 31, 1988.

²⁷ Jay Rife, real estate broker, Dickenson and Buchanan Counties; testimony at public hearing, Grundy, Va., August 30, 1988. H. A. Street,

Esq., coal company executive; testimony at public hearing, Grundy, Va., August 30, 1988. Judy McKinney, V. P., Dickenson County Citizens Committee; testimony at public hearing, Clintwood, Va., August 31, 1988. Connie Boswell, homeowner in Dry Fork community near Vansant, Va., Buchanan County; testimony at public hearing, Grundy, Va., August 30, 1988.

²⁸ Beulah W. Brown, former resident of Dickenson County; testimony at public hearing, Clintwood, Va., August 31, 1988.

²⁹ Glenna Rose, resident of Caney Ridge, Dickenson County; testimony at public hearing, Clintwood, Va., August 31, 1988.

³⁰ Tommy Hudson, President, Va. Coal Association; testimony at public hearing, Grundy, Va., August 30, 1988.

³¹ Ken Price, Gen. Mgr., Va. Division of Island Creek Coal Co.; testimony at public hearing, Grundy, Va., August 30, 1988.

³² Jerry McPhee, Dir. of Gov't. Relations, Island Creek Coal Co.; testimony at public hearing, Grundy, Va., August 30, 1988.

³³ Gary Slagel, Director, Environmental Regulatory Activities, Consolidation Coal Co.; testimony at public hearing, Grundy, Va., August 30, 1988.

³⁴ Larry Jackson, V. P., engr., Westmoreland Coal Co.; statement presented at public hearing, Clintwood, Va., August 31, 1988.

³⁵ Gene Mathis, President, Pittston Coal Group; testimony at public hearing, Clintwood, Va., August 31, 1988.

Dissenting Report

We, Alson H. Smith, Jr., Jack Kennedy and Robert E. Russell dissent from the foregoing report, findings and recommendations and would offer the following report, findings and recommendation as our dissenting opinion.

I. THE LAW

A. FEDERAL

In 1977, Congress passed the Surface Mining Control and Reclamation Act (SMACRA), which applies to the surface effects of surface and underground mining. Virginia assumed primacy of this program in 1981 and is currently administering it under the oversight of the federal Office of Surface Mining Reclamation and Enforcement (OSMRE). As initially written and enforced, SMACRA required that coal operators "restore, repair or replace" land and structures materially damaged by subsidence. However, due to a federal court decision, the OSM revised its rule to mandate ". . . repair of structures to the extent required by state law." The Virginia Department of Mines, Minerals and Energy (DMME) then amended its regulations to comply with the new federal language.

B. VIRGINIA

Currently, the Virginia Code does not specifically refer to "longwall" mining or "subsidence." However, § 45.1-243 authorizes the Department to promulgate regulations regarding the surface effects of underground mining operations. The Virginia law incorporates all of the provisions of Section 516 of the Federal Act which establishes a comprehensive regulatory program addressing subsidence.

The extent to which the surface subsides depends on a variety of factors including the depth of the mining, strength and nature of the rocks overlying the coal, the width of mining and amount of coal being removed. The extent to which structures on the surface are affected by subsidence depends largely on their design, material and construction.

The current regulatory program protects public safety, public water supplies, public facilities and prevents material damage from unplanned (unpredictable) subsidence. It also provides for notification of the owners and occupants of dwellings prior to mining in order that they may protect their property rights in court if necessary. It requires that in all cases, any damage to the land itself be repaired by the operator.

The regulations adopted under SMACRA by DMME emphasize the prevention of damage from unplanned subsidence. They do not attempt to prevent subsidence. Under Virginia regulations, coal operators are required to do the following:

1. Conduct a pre-mining survey to determine the nature of structures and renewable resource lands (farmland or commercial forests) which could be conceivably affected by the proposed underground mining. The purpose of the survey is to determine whether subsidence, if it occurs, could cause material damage

or diminished use of the structures or the renewable resource lands. No further information is required in the subsidence control plan but the operator must repair any damage that he causes to the land. Also, in all types of mining the applicant must demonstrate that his actions will not harm the overall hydrologic balance.

2. Submit a subsidence control plan. Requirements for this plan depend on the percentage of coal which is planned to be extracted.
 - a. For operations where fifty percent or less of the coal will be removed, subsidence generally causes no significant problems. The operator is required to provide information on the mining methods and the plan for development of the underground workings.
 - b. For operations with fifty to eighty percent extraction rates, subsidence can occur in various magnitudes and can be delayed for decades. Operators must demonstrate that they will take measures to prevent subsidence and its related damage or will plan subsidence to occur in a predictable and controlled manner. Subsidence can be minimized in these types of mines by leaving pillars of coal in strategic locations or by back stowing mined-out areas. Material damage can be controlled by reinforcing or relocating structures and by monitoring surface changes to determine if other measures need to be taken.
 - c. For operations with extraction rates between eighty and one hundred percent, subsidence occurs immediately after mining and typically concludes within six months of extraction. The law allows for the occurrence of planned subsidence in a predictable and controlled manner.
3. Provide special protection for certain types of buildings and surface features, including public buildings, perennial streams, or impoundments with a storage volume of twenty acre-feet or more. Mining cannot take place underneath or adjacent to these features unless the Division of Mined Land Reclamation (DMLR), on the basis of detailed subsurface information, determines that subsidence will not cause material damage.
4. Notify all surface owners and occupants at least six months prior to mining. This notification includes the specific areas to be undermined, and the location of where the subsidence control plan can be reviewed.
5. Prior to obtaining a permit, all applicants (whether for surface or underground operations) must demonstrate that the proposed mining activity will not cause a negative and permanent effect on the cumulative hydrologic balance. Mining plans must be designed to prevent any such damage. Also, no permit can be issued for undermining an impoundment holding twenty acre-feet or more, or an aquifer which is a significant source for any public water supply, unless the applicant can demonstrate that there will be no material damage.

6. Authorizes the agency to suspend mining in urbanized areas if continued mining presents an imminent danger.

Unlike surface mine operators who are required by federal and state law to replace water supplies damaged by their operation, underground mining operators face no similar replacement requirements. However, where a duty of subjacent support exists, underground coal operators may be held liable for the destruction of surface waters if such destruction results from a failure to support the surface properly. Where underground coal operators have maintained sufficient surface support and surface waters are damaged, there is no liability.

The presiding case law regarding subsidence damage in Virginia is found in Stonegap Colliery Co. v. Hamilton, 119 Va. 271 (1916). In that case, the court stated that if the surface owner "desires to reserve rights inconsistent with the full enjoyment of the surface, it is his duty to reserve those rights by clear and unequivocal language." Without such a waiver, the law therefore requires that the person with rights to be undermining coal must leave enough support so as not to interfere with the landowner's enjoyment of the surface or be held liable for damages sustained. The court went on to state "[W]here one grants the minerals under the surface with the privilege of mining such materials, the support of the surface is a part of the estate reserved in the grantor; while on the other hand, if one sells the surface reserving the minerals, the grantor in removing the minerals reserved, must leave or provide sufficient support for the surface to prevent its subsidence, unless, in either case, there is some additional statutory or unequivocal contract authority therefore." The court went on to state "it is well settled that the grant of the surface with a reservation of the minerals and the right to extract the same does not permit the destruction of the surface, unless the right to do so has been expressed in terms so plain as to admit of no doubt." Therefore, although no specific words are necessary to show a surrender of subjacent support, the presumption is in favor of such support and should not be taken away by mere implication. Stonegap at 288.

Mineral deeds generally deal with subjacent support in one of the following three manners:

- (1) some explicitly state that the mineral owner has the right to subside;
- (2) some grant subjacent support rights to the surface owner; and
- (3) others (especially those negotiated around the turn of the century) are written in general terms and may not specifically address the right to subside.

It should be noted that a recent case, Gerald Large, et al. v. Clinchfield Coal Co., was recently decided in the Circuit Court of the County of Dickenson, and has been appealed to the Virginia Supreme Court. The Circuit Court's finding of facts included:

- (1) longwall mining, by its inherent nature, removes all subjacent support; and
- (2) that neither the surface tract owners nor their predecessors in title waived the right of subjacent support.

The Court decided that the surface tract owner had the absolute right of subjacent support, and that the mining company did not have the right to utilize longwall mining beneath the surface owner's tract.

II. THE EFFECTS OF LONGWALL MINING

A. POSITIVE

1. Safety

The longwall mining method provides increased worker safety because shields above miners working on the face prevent injuries from roof falls.

2. Increased productivity

Longwall mining accounted for approximately eighteen percent of the 45.5 million short-tons of coal produced in the Commonwealth in 1987, while continuous mining methods accounted for nearly sixty-seven percent. However, while annual surface and continuous mining production totals have remained fairly constant during the 1980's, annual longwall production totals have consistently increased since 1982. A DMME spokesman has estimated that the continuous mining method would require the use of 100 people to mine 3,500 tons of coal in eight hours while the same amount of coal could be mined in eight hours using the longwall method and many fewer miners.

According to testimony received at the public hearing, longwall mining is the only economically feasible method to mine coal from deep seams. As many of the shallower coal seams have already been mined, coal operators will have to mine these deeper seams in the future. Many speakers stated that in order to be competitive with other coal producers in the United States and abroad, the longwall method of mining is necessary.

3. Employment

Testimony at public hearings indicated that both unions and management support the use of the longwall mining method. Testimony indicated that numerous employees were needed in order to develop longwall panels and to support the longwall operation with transportation, supplies, ventilation, maintenance and other activities. A number of speakers stated that longwall mining has saved jobs, rather than causing unemployment.

4. Economic benefits

Coal production in Southwest Virginia is of major importance to that region's economy. For example, Island Creek's five longwall mines in Buchanan County account for the largest payroll in that county: 46 million dollars. Consolidated Coal Company's longwall mine in Buchanan constitutes a 2.5 million dollar tax base for that area. As competition in the world market continues to increase, and

as operators are required to mine deeper seams of coal, the longwall method of mining will become more and more important to the economy of Southwest Virginia and to the state as a whole.

Southwest Virginia is a region already hampered by a depressed economy and outward migration. Further restrictions on mining would exacerbate this condition resulting in increased unemployment and deterioration of the local tax base.

In addition to the employment provided in underground mines, the local governments receive a substantial portion of their local revenues from the coal produced in their localities. Restrictions on the types of mining method would restrict production and likewise would restrict revenue from severance taxes.

B. NEGATIVE

1. Subsidence

From a purely technical standpoint, the term subsidence refers to vertical settlement. Other types of movements (i.e., horizontal) caused by mining also affect surface structures. For purposes of this report, however, subsidence will be used to describe all types of land movements.

Dr. Karmis indicates that subsidence may result from any form of underground mining. Subsidence due to longwall mining develops regularly, is completed within a relatively short time after mining has ceased, and can be predicted with reasonable accuracy. Although surface movements can be precalculated accurately, prediction of damage to surface structures is difficult to accomplish due to insufficient knowledge regarding the interaction between ground and structure and the lack of acceptable damage criteria in the United States.

The damage to surface structures and water supplies caused by subsidence is the most objectionable effect of longwall mining, according to most of the speakers who testified at the public hearings held by the subcommittee. Homeowners complained of water loss, as well as cracked foundations, walls and fireplaces, misalignment of doors and windows causing them to not function properly, etc. Although mining companies indicate that they attempt to mitigate these damages by supporting homes through the use of jacks and girders, homeowners complain that these mitigation techniques, sometimes performed daily, constitute a major inconvenience and interrupt their personal lives.

Compensation for structural damages caused by subsidence are arrived at through voluntary settlements or court-ordered damages. A number of homeowners, with or without proper justification, have refused to settle for amounts offered by the mining companies, and have chosen to litigate the matter. Most companies have adopted compensation policies, although these policies differ. For example, one company's policy may provide that if a homeowner's supply of water is destroyed, the company will pay for the cost of hooking the

homeowner up to the public water supply, where available. The company does not pay for the actual water, although the landowner's well water supply prior to mining may have been free.

A number of homeowners testifying before the subcommittee complained about the emotional effects caused by subsidence. They expressed concern about homeowners who were forced to relocate due to subsidence-related damages to their homes. They explained that they were fearful of the damage that was occurring to their homes which they could not actually see. They also described the "booms" or shocks which they had experienced and which had been strong enough to wake them up at night. Dr. Karmis indicated that these vibrations occur in areas where the fracturing strata above the mining activity is very thick and strong (i.e., Buchanan County). According to Dr. Karmis, when that strata breaks, it is a violent action.

A jurisdiction's tax base also allegedly suffers when there are damages caused by subsidence. Property values decrease and property owners whose homes have been severely damaged are forced to move elsewhere. Testimony indicated that it is difficult to attract new owners to areas affected by subsidence.

2. Employment

Although some testimony indicated that longwall mining had saved jobs, other speakers testified that fewer jobs were available with this method of mining than with conventional room and pillar mining. They claimed that the longwall method of mining, by its very nature, is less labor-intensive than other coal mining methods.

III. FINDINGS

1. The existing federal program which is implemented in Virginia provides adequate controls on underground mining to ensure proper protection of the land and hydrologic balance. There being no additional environmental protection necessary, there is no need to alter Virginia law or alter the requirement that Virginia's regulatory program remain parallel to the federal program.

2. There are unresolved problems relating to property issues and conflicts between estate holders. These problems include rights of affected parties in resolving questions of liability in the event of damage to individual residences and individual water supplies.

Because there is a myriad of contractual arrangements between surface and mineral owners, there is no single solution to resolving these problems.

There are major policy and constitutional issues arising from proposals to resolve problems between estate holders. The implication of debates over this issue extend beyond mining reclamation law and Southwest Virginia to contract and property law and any action would have statewide impacts.

3. The federal government is now debating the same type of property rights disputes in its proposed rulemaking relating to applicability of the prohibitions of the Surface Mining Act to the surface impacts of underground mining. The proposed rule deals directly with the unresolved problems of property rights as they relate to the surface effects of underground mining. The final rule which will define valid existing rights as relate to the degree of subsidence allowed under surface properties including individual homes and cemeteries will be implemented in Virginia.

IV. RECOMMENDATIONS

The subcommittee recommends that there be no state legislation on this matter. Resolution of the unresolved property disputes have major policy implications and constitutional questions. The federal government is now considering a rule which would address these unresolved property disputes and resolution of these matters on a national level will provide consistent protection for surface owners and a consistent regulatory framework for industry.

Respectfully submitted,

Alson H. Smith, Jr.
Jack Kennedy
Robert E. Russell

* William F. Green respectfully declined to endorse either of the foregoing reports, findings or recommendations.

