REPORT OF THE

# Virginia Coal and Energy Commission

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

# Senate Document No. 15

COMMONWEALTH OF VIRGINIA
RICHMOND
1985

## MEMBERS OF COMMITTEE

Daniel W. Bird, Jr., Chairman
A. Victor Thomas, Vice Chairman
James F. Almand
Walter C. Ayers
John C. Buchanan
L. Blaine Carter
Charles J. Colgan
J. Paul Councill, Jr.
Cynthia J. Dahlin
Jerry D. Duane
Herbert O. Funsten, Ph.D.
Virgil H. Goode
Glenn B. McClanan
Everard Munsey
Frank W. Nolen
Lewis W. Parker, Jr.
Ford C. Quillen
Alson H. Smith, Jr.
John Watkins
Richard A. Wolfe, Ph.D.
Donald L. McGlothlin, Sr., Ex-Officio Member

---

## STAFF

### Legal and Research

Michael D. Ward, Staff Attorney

Mary R. Spain, Staff Attorney
Martin G. Farber, Research Associate
Mary Elizabeth Cosler, Secretary

**Report of the**
**Virginia Coal and Energy Commission**
**To**
**The Governor and the General Assembly of Virginia**
**Richmond, Virginia**
**January, 1985**

To: Honorable Charles S. Robb, Governor of Virginia,
and
The General Assembly of Virginia

## I. INTRODUCTION

The Virginia Coal and Energy Commission was established as a permanent agency of the Commonwealth in 1979. Since that time, it has sought in a number of ways to carry out its charge to "study all aspects of coal as an energy resource and... to stimulate, encourage, promote, and assist in the development of renewable energy resources..." (§ 9-145.1 of the Code of Virginia). This document is submitted as the Commission's report on its 1984 activities.

## II. MEMBERSHIP

A complete list of Commission members can be found inside the cover of this report.

Delegate John Watkins was appointed to the Commission in 1984, replacing George W. Jones.

Daniel W. Bird, Jr., was elected as the Commission's chairman during 1984.

## III. SUBCOMMITTEE REPORTS

Since most issues are studied carefully in standing subcommittees before presentation to the Commission for its consideration, reports of each of the Subcommittees are set out below. Members are listed for each subcommittee, with the chairman's name first. The Commission's chairman and vice chairman serve ex officio as members of all subcommittees.

A. Renewable Energy (Goode, Colgan, Funsten, Watkins, Nolen, and McClanan)

The Renewable Energy Subcommittee's role is to identify reasonable statutory changes that would help promote the use of renewable energy sources, to encourage the use of these resources by state agencies and institutions, and to disseminate of information on renewable energy sources to the citizens of the Commonwealth.

This year, the Subcommittee was acquainted with several projects and programs that are designed to enhance the utilization of renewable energy.

The Subcommittee was briefed on the "Aqua II" wood/water stove device which is being developed mainly for residential and small business use. It can provide heat and hot water because of a unique process whereby a water tank and wood stove fire box are combined for heating efficiency. The system can also be combined with solar collectors for further versatility, making the system, with the exception of the stove and fire box, eligible for solar tax credits. The Subcommittee was also informed that Aqua II commercial water stoves have been developed for industrial use.

The Subcommittee also received an update this year on current results from participation in the solar tax credits program. This program is set out in the Virginia Code and provides for credits on solar energy equipment expenditures made from from 1983 to 1987. According to statistics gathered by the Virginia Division of Energy, as of August of 1984, processed claims for solar tax credits indicated that 1,385 persons had claimed credits. These averaged $770 each for a total credit amount equaling $1,065,495. Also, through August, three corporate claims had been

filed totaling $1,760.

The Division of Energy also contacted Reynolds Building Products, Solar Division, in Fairfax, the State's major solar products distributor. Reynolds experienced a 1500% increase in sales since the introduction of the solar tax credits law. Reynolds pointed out that before the solar tax credits, they did 10% of their business in Virginia. Now 90% of their business is in Virginia.

The Subcommittee was further informed of the implementation of a new joint program between the Virginia Housing Development Authority and the Virginia Division of Energy that allocates grants up to $5,000 to purchasers of new solar homes. Passive and active solar homes are eligible; and the potential effectiveness of the the solar design of the home is evaluated to determine the grant amount.

The Subcommittee was very interested this year in facilities which are incorporating wood burning systems as an alternative to conventional gas, oil or coal burning systems. The Division of Forestry reported on two proposed systems to be instituted in 1985. One is planned for a geriatric hospital in Burkeville, Virginia. The other is planned for the new Augusta County prison complex. Plans for the prison heating system were presented; these showed a process that could utilize sawdust and/or coal in the prison boilers.

The Subcommittee also heard a presentation on Longwood College's wood chip burning project and toured the school's physical plant to see how the system operates.

Mr. Wadi Williams, Director of the Physical Plant, gave a summary on the background of the wood chip burning project. Some of the boilers at Longwood were converted at virtually no cost, so that they utilize wood as an alternative to coal. Wood chips are obtained locally, and the system is being redesigned to accommodate sawdust and smaller wood chips. The college spent $200,000 less on fuel in 1983 than it had in 1981. These savings represent over 40% of the total 1981 fuel budget. The only problems pointed out were the repairs necessitated by the age of the original coal and oil system and the need for more storage space for wood chips and sawdust.

B. Energy Preparedness (Almand, Ayers, Duane, Munsey, Parker, Colgan, McClanan)

In 1981, this Subcommittee was asked to oversee the development of an energy policy for the Commonwealth. Throughout 1982, the Subcommittee worked on this matter, assisted by individuals from the Governor's Office, the State Energy Office, the Division of Mineral Resources, the Fuel Conversion Authority, the State Corporation Commission, and VPI & SU. In January of 1984, it presented the Commission with an interim report. This report, entitled "Energy Issues for Virginia," sought to identify and analyze the major energy issues facing the Commonwealth. As a follow-up to the report's recommendations, the Subcommittee reviewed the Department of General Services' efforts to control energy costs in state facilities and received an update on the Commonwealth's low income energy assistance programs.

The Department of General Services has staffed a new unit whose responsibility is to control energy costs in the State's facilities. Energy managers have been designated for each facility. As part of an overall strategy to control energy costs, this new unit is also developing an energy conservation training program for facility managers; investigating the feasibility of blanket or centralized purchase contracts for energy conservation equipment; identifying opportunities for capital improvements through the use of energy audits performed by contracted engineers; and developing an energy use tracking system. Much of the initial effort will be concentrated in those facilities within the Richmond area.

The State Department of Social Services and the Division of Energy reviewed with the Subcommittee the status of their low income energy assistance programs. Social Services reported that as of October, 1984, 4,800 residences had been weatherized. This compares favorably with the entire 1983 effort when 4431 units were weatherized. The State Board recommended that the maximum allowable percentage of fuel assistance funds (15%) be allocated to weatherizing. This represents approximately $4.5 million . The Board as well as the Subcommittee felt that this approach will be a longer term solution than continuously providing fuel funds for an inefficient housing stock.

Both the Department of Social Services and the Division of Energy have embarked on pilot

programs which focus on the heating systems of low income residences. The Department of Social Services has expended approximately $100,000 to retrofit furnaces by replacing inefficient burners. The Division of Energy has allocated $100,000 for a furnace tune-up program. Although the evaluation of this program is not yet completed, interim results are encouraging. Pretests showed a high percentage of inefficient oil furnaces among this population. The tests indicate that twenty percent of the heating systems had problems so serious they were inoperable. After the tune-ups the systems are burning within cleanliness standards, with an average efficiency raise to seventy-four percent.

It is felt that these types of programs represent a longer term solution to meeting the heating needs of low income residents than a program providing a limited amount of fuel assistance funds for inefficient heating systems.

During 1984, in order to further the awareness of Virginians as to energy issues and to encourage the conservation of energy throughout the Commonwealth, the Subcommittee initiated the signing of a proclamation by the Governor declaring October 21-28, 1984, as Virginia Energy Awareness Week. This was set to coincide with American Energy Awareness Week to recognize activities and to promote initiatives for greater energy security for the Commonwealth and the nation. At the request of the Subcommittee, energy-related resources and technologies which are manufactured and processed in Virginia were emphasized during the week in recognition of the "We Have it Made in Virginia" campaign. This was accomplished with the assistance of the Virginia Division of Energy, which also sponsored a special display on Energy Conservation at the State Capitol during the week. On October 23, 1984, the Subcommittee took part in the ceremony at the Governor's Office where the proclamation declaring "Virginia Awareness Week" was signed (Appendix A).

C. Coal (Quillen, Buchanan, Carter, Dahlin, McGlothlin, Wolfe)

During the past year, the Coal Subcommittee's attention has been focused on three things:

1. A better understanding of marketing opportunities for the coal industry;

2. A better understanding of of all facets of the industry and how it operates; and

3. A better understanding of the current coal industry and its research needs.

Beginning in the spring, and continuing throughout the year, the Subcommittee has worked with Dr. Walter Hibbard on a study that the Virginia Center for Coal and Energy Research is conducting. The purpose of the study is to analyze the current performance of the Virginia coal industry. More specifically, Dr. Hibbard and his colleagues hope to determine why Virginia is lagging behind West Virginia, Eastern Kentucky, and the collective United States coal industry in the current market recovery. Dr. Hibbard presented some of the preliminary results. He informed the Commission that the Virginia coal industry had lost ten percent of its markets to Eastern Kentucky and West Virginia, which are both having record years. A survey of coal producers suggests their problems include high transportation costs, a depressed steel industry, higher mining costs and weak demand. Using Department of Energy statistics on the delivered costs of coal to Virginia utilities, Dr. Hibbard's findings show that beginning in 1980, Virginia become a high cost producer relative to West Virginia and Kentucky. This resulted in Virginia supplying a smaller percentage of coal to Virginia utilities than either of these other two states. The data also suggests that the lowest delivered costs result when the shipper and receiver are on the same railroad. Dr. Hibbard noted that since most mines and plants are on a single railroad line, a competitive advantage results for certain mines with customers on the same railroad.

Dr. Hibbard's study did raise the issue of whether the State Corporation Commission was collecting data on the utilities' fuel cost. Ms. Linda Tuck, an analyst with the SCC, informed the Coal and Energy Commission that the SCC was mandated by law to monitor fuel costs. In fact, the SCC had developed a sophisticated fuel index model which was being looked at by other public utility commissions.

In order to better appreciate how the coal industry operates, the Subcommittee arranged for a tour of a mine equipment manufacturing company, underground and surface mines, and mine

reclamation projects. This tour took place over a two-day period during September.

The two-day meeting began with a visit to Joy Manufacturing Company, which makes mining equipment. The Subcommittee then toured, in areas near St. Charles, Virginia, an active surface mine, an area reclaimed to conform to AOC (Approximate Original Contour) standards, an area reclaimed under the AML (Abandoned Mine Lands) Program, an area mined under a pre-AOC permit, and a refuse deposition area where reclamation was taking place. The Subcommittee was also shown the area surrounding the town of St. Charles, where a variety of watershed and other reclamation projects had been undertaken.

On the same day, the Subcommittee was taken through the offices of the Division of Mined Land Reclamation and the Division of Mines and Quarries, where explanations of the work of the two divisions were given. Later, a meeting was held at Mountain Empire Community College. There, Fred Walker, Director of the Department of Conservation and Economic Development, reviewed the reorganization efforts that established the Department of Mines, Minerals and Energy on January 1, 1985. He also discussed mine safety issues. Finally, the Subcommittee viewed the Powell River Project site. The project is a demonstration of post-mining reclamation uses for land. Major participants are Penn Virginia Corporation and VPI & SU. The meeting was continued at Mountain Empire Community College the next day. There, the Subcommittee was shown the college's facilities for its mining education programs. Dr. Richard Wolfe reported on research efforts in the industry. A major initiative his firm has undertaken involves the conversion of coal into a liquid form. The Subcommittee completed its site visits with a tour of two underground coal mines (Bullitt and Holton) operated by Westmoreland Coal Company.

At a meeting held on November 2, 1984, in Blacksburg, the Subcommittee was taken through the offices and laboratories of the Virginia Center for Coal and Energy Research and the Mining Engineering Department of VPI & SU. At times during the tour, Subcommittee members noted the inadequacy of financial support given these important research programs. Some of the equipment being used was thirty years old or older. It seemed to the Subcommittee members that there is a pressing need for more funds for these research programs.

Another issue that the Subcommittee is addressing concerns the regulatory reform review which was requested by the Coal and Energy Commission in its 1984 report (Senate Document No. 13, Appendix F). Mr. Bob Beard, of the Department of Labor and Industry, provided the Subcommittee with an update of the regulatory review performed by his agency. There were only six Mines and Quarries regulations effected and these regulations are limited in scope, consisting of 101 rules. A survey of the industry, done as part of this review, indicated general satisfaction with the regulations. Only a few revisions were suggested; those are in such areas as medical care, vertical mine ventilation and the use of cabs and canopes. In general, the review showed that the regulations are seen as reasonably effective with little, if any, conflict or duplication.

Mr. Leon App, of the Division of Mined Land Reclamation, informed the Subcommittee that an extensive review had been made of the Federal Surface Mine Act in order to bring Virginia in conformity with the federal regulations. The Federal Office of Surface Mines has made changes in sixty percent of its regulations, thereby necessitating changes in Virginia's regulations. Among the criteria used in the review were whether there was duplication, the effectiveness of the regulations, cost, clarity of language and the ability to enforce.

The review resulted in the reduction in the number of regulations from 500 to about 270, and the elimination of the Technical Regulations Handbook. The regulations are now stated in simple language and logically sequenced. These new regulations will be submitted to the Governor's Office as called for in the Administrative Process Act.

A final issue before the Subcommittee is the ongoing debate concerning solutions to the acid rain problem. Testimony presented to the Coal and Energy Commission at its November 16, 1984, meeting requested acknowledgement of the need for flexibility in federal legislation on standards designed to reduce the problem. The Coal Subcommittee agreed to reaffirm the resolution which asked Congress to ensure that flexibility.

E. Uranium (Councill, Colgan, Funsten, Nolen, Rosi, Smith, Watkins, Wolfe)

The Uranium Subcommittee (U.S.) was combined with the Uranium Administrative Group (U.A.G.) during the 1984 deliberations. The UAG was begun in 1983 for the purpose of finishing the detailed studies of the risks, effects, costs and benefits of uranium development in the Commonwealth. The Commission also established an interagency task force to assist the Uranium Subcommittee and the UAG in completing their work.

On October 1, 1984, this interagency task force submitted a report to the US/UAG specifying state performance standards which would be necessary for uranium mining and milling. This report also proposed a state regulatory framework for the administration and enforcement of the standards and regulations.

The US/UAG reviewed the task force report and formulated recommendations for the prerequisites and state performance standards believed necessary for uranium operations in the Commonwealth. These recommendations and specific proposals are set out in the US/UAG report in Appendix B below. More detailed recommendations are carried in the task force report and have been forwarded to the Commission for its consideration.

The Commission charged the Uranium Subcommittee with the task of reviewing proposed uranium draft legislation in November, 1984. The Subcommittee met on four occasions to review the legislation, to address specific concerns raised by the statutory language, and to ensure that the recommendations of the Uranium Task Force and the US/UAG were accurately reflected in the draft. In coordination with this effort, representatives of those state agencies which would be instrumental in the state regulatory program were contacted in order to assure that the agencies were satisfied with provisions of the draft which laid out their responsibilities.

The Uranium Subcommittee focused its attention on several sections of the draft and some changes were endorsed. One of the major revisions to the draft was to insert language into the legislation which would require a uranium licensee to develop a closure and post-closure plan, provide financial assurances for closure and post-closure care, and pay into a Uranium Response Fund which would guarantee one million dollars up front before any uranium production takes place. The Fund would be available for use by the Commonwealth, at any time, for responding to to releases or threatened releases of any contamination into the environment.

The Subcommittee submitted the draft with these revisions to the Commission on December 17, 1984, reporting that it adequately places into statutory form, the specific state performance standards and recommendations of the Task Force and US/UAG Reports. The Uranium Subcommittee also asked for a refinement of the cost estimates submitted by the state agencies for starting up a regulatory program. This assessment was made with short-term costs in mind and under the assumption that Virginia would reach agreement status by 1986. The total projected cost for the agencies up to July 1, 1986 is $1.6 million.

## IV. RECOMMENDATIONS

After careful consideration, the Commission has accepted the reports of its subcommittees. Based on these reports, the Commission makes the following recommendation: the proposed uranium draft legislation be passed on, without specific endorsement,* for consideration by the 1985 Session of the General Assembly.

Respectfully submitted,

Daniel W. Bird, Jr., Chairman

A. Victor Thomas, Vice Chairman

James F. Almand

Walter C. Ayers

John C. Buchanan

L. Blaine Carter

Charles J. Colgan

J. Paul Councill, Jr.

Cynthia J. Dahlin

Jerry D. Duane

Herbert O. Funsten, Ph.D.

Virgil H. Goode, Jr.

Glenn B. McClanan

Everard Munsey

Frank W. Nolen

Lewis W. Parker, Jr.

Ford C. Quillen

Alson H. Smith, Jr.

John Watkins

Richard A. Wolfe, Ph.D.

Donald L. McGlothlin, Sr., Ex-Officio Member

*Twelve members voted in favor of a motion to pass on the proposed legislation without specific endorsement to the General Assembly and eight voted against the motion.

# CERTIFICATE of RECOGNITION

*By virtue of the authority vested by the Constitution in the Governor of the Commonwealth of Virginia, there is hereby officially recognized:*

VIRGINIA ENERGY AWARENESS WEEK

It is essential that Virginians be well-informed on energy conservation and resource development in order to maintain and expand the advances made by Virginians and Virginia industries in recent years. It is especially important for Virginians to be aware of energy-related products and technologies manufactured and used in Virginia. To this end, I call on the leadership of state and local governments, business, industry, labor, civic organizations, consumer groups, educators and other associations, and all Virginians throughout the Commonwealth, to establish a partnership for an energy-efficient tomorrow.

Accordingly, I, Charles S. Robb, Governor, do hereby recognize the week of October 21-28, 1984, as VIRGINIA ENERGY AWARENESS WEEK. We join the rest of our nation in celebrating American Energy Awareness Week with appropriate activities, recognition and initiatives which promote greater energy security for our Commonwealth and our nation, and which educate Virginians on energy-related products, resources and technologies manufactured, processed, and utilized in Virginia.

_____

Governor

## APPENDIX B

TO: Coal and Energy Commission

FROM: Uranium Subcommittee/Uranium Administrative Group

### I. INTRODUCTION

In 1981, the General Assembly approved House Joint Resolution No. 324, requesting the Virginia Coal and Energy Commission to evaluate the effects of uranium development on the Commonwealth and its citizens. During the time since then - nearly four years - a great deal of time and effort has gone into one of the most thorough legislative studies ever undertaken in Virginia. The full Coal and Energy Commission has been involved in this process, holding meetings and public hearings throughout that period. In addition, a Uranium Subcommittee was created by the Commission Chairman to study the matter in greater detail and depth. This Subcommittee has made site visits to mines and mills in Texas, New Mexico, and Colorado. It held an informational seminar at Washington and Lee University. In a variety of other ways, it has sought to familiarize itself with the relevant issues.

In 1983, the Commission asked the General Assembly to create a Uranium Administrative Group (U.A.G.), made up of the heads of seven state agencies and an equal number of citizens appointed by the Commission Chairman, the Governor, and local governing bodies. The role given the U.A.G. was to assist the Commission in conducting detailed studies of the risks, effects, costs, and benefits of uranium development in the Commonwealth. The U.A.G. also made site visits, held meetings, and used other means to inform itself on the issues.

When it became evident that the study could not be completed prior to 1984, the Coal and Energy Commission asked the U.A.G. and the Uranium Subcommittee to complete it during 1984. In addition, the Commission established an interagency task force (primarily those that were already on the U.A.G.) to assist the Uranium Subcommittee and the U.A.G. in completing the study.

### II. Recommendation

We the members of the Uranium Subcommittee and the U.A.G. submit this report and transmit the report of the task force, thus completing the work given us last year. On October 1, the task force reported its findings and recommendations to us. We commend the task force for its diligent work. We also commend the Institute for Environmental Negotiation for the invaluable assistance it gave the task force. We have read and studied the task force report and held public hearings on its recommendations. We ourselves have discussed and debated these recommendations.

Based on all these efforts, we now conclude that the moratorium on uranium development can be lifted if essential specific recommendations derived from the work of the task force are enacted into law. Should any of these basic prerequisites fail to be included in legislation, we as a group can no longer support the above conclusion.

Our recommendations for the prerequisites we believe necessary and the specific task force proposals that we endorse are set out below. More detailed recommendations are carried in the task force report and are forwarded, without specific endorsement, to be considered and studied by the Commission.

1. We believe that it is essential that Virginia become an agreement state with the right to license a uranium development facility.

2. We recommend that the following standards be imposed for uranium facilities: a total radiation dose standard for the general public of 25 millirem per year above background for sources other than radon and a concentration standard of one picocurie per liter above background for radon at any time. Together, these would yield a total maximum exposure level

of 285 millirem per year for the nearest exposed individual. We also recommend, however, that the General Assembly specify that the ALARA principle (as low as reasonably achievable) be applied during permit review at a specific site in order to achieve doses less than the maximum 285 millirem level.

3. We believe a specific statute appropriate for the regulation of uranium mining should be enacted.

4. We recommend that the state's current non-degradation standard with respect to water should be clearly affirmed and made applicable to uranium development; we do not believe, however, that any socio-economic variances should be allowed for uranium operations.

5. We agree that no process water should be allowed to be discharged to surface waters from either the mill or the tailings facility.

6. We recommend that state regulations and performance standards that govern hazardous waste land disposal facilities be specifically applied by statute to uranium development facilities. On the basis of information and clarification received following the completion of the task force's deliberations, we do not necessarily recommend that a 5 picocurie per gram standard be employed to determine when sub-grade ore and waste rock should be treated as a hazardous waste. It is our understanding the EPA standards in this regard are forthcoming which the State would then adopt; if such standards are not forthcoming, the threshold level should be addressed by the State.

7. We agree that a schedule of financial guarantees and fines should be developed to assure strict compliance with license and permit conditions. It is very important that such a schedule be developed carefully, since the taxpayer will likely bear the ultimate liability for compliance failures that have not been properly addressed in the schedule.

We also agree that a strict liability policy for damages be adopted and that this policy be supervised by the courts.

8. We recommend that a regulatory program be enacted which assigns (i) the Department of Health lead responsibility for negotiating an agreement with NRC and for issuing mill and tailings licenses, (ii) the Department of Mines, Minerals and Energy lead responsibility for licensing mines and for on-site monitoring and enforcement, and (iii) responsibility to these and other agencies for matters within their established areas of authority. We also urge the continuation of the task force as a coordinating body while the regulatory program is being put in place.

9. We agree that the task force should work during 1985 on a detailed budget for the total regulatory program. In an effort to acquaint the General Assembly with the projected costs of a regulatory program, however, we have asked the regulatory agencies for individual cost estimates. This data is attached to this report as Appendix I.

## III. A Note on the Value of Cost-Benefit and Risk Assessment Studies

A major portion of the work that underlies the recommendations of both the task force and the Uranium Subcommittee/U.A.G. concerns analyses of the costs, benefits, and risks likely to accompany uranium mining and milling operations.

We felt it was important, in evaluating whether uranium development should be allowed to determine whether the benefits associated with development would exceed the costs. The Tayloe Murphy Institute (TMI) was retained to assist with this assessment. In its report, TMI emphasized "that a large degree of uncertainty exists as to the magnitude of some costs and benefits." We acknowledge this fact. What we sought is to have costs and benefits quantified where possible and, at the same time, to note those which do not lend themselves to quantification.

We also wished to assess as well as we could the risks that the population at large would face from a uranium development facility. We realize that differences of opinion exist within the scientific community over the relative risks an individual experiences from exposure to a given level of radiation. Based on the studies done thus far at the proposed development site in Pittsylvania, our consultants have told us that a total of .04 additional fatal cancers are likely for the population within fifty miles of the project during its thirteen years of operation. Some individuals have argued that the risk is actually ten to fourteen times greater than our consultant's estimate. If this is so, the risk increases to .4 or .56 additional cancer deaths. This can be compared with the 140,000 fatal cancers that can be expected during the lifetime of that same population whether or not uranium is mined.

## IV. Draft Legislation

We are attaching as Appendix II to this report legislation drafted by the Division of Legislative Services to accomplish the recommendations included in this report. Because of the time constraints involved in this study, we as a group have not had time to review or comment on this draft. Therefore, we pass it along simply as a staff document.

## V. Summary

Our work and the task force's studies this year provide a reasonable basis for a legislative judgment on the costs, risks and benefits of uranium development in the Commonwealth. Further studies and more detailed analyses of specific uranium development proposals will be appropriate and essential ingredients of the licensing process. We wish to reiterate our conclusion that if the General Assembly lifts the moratorium on uranium development, it should simultaneously enact into law recommendations set out in this report to assure adequate state regulation of uranium mining and milling.

Respectfully submitted,

J. Paul Councill, Jr., Chairman

* Watkins M. Abbitt, Jr.

Richard Burton

Keith Buttleman

Mason Carbaugh

* P. Scott Eubanks

* Herbert O. Funsten, Ph.D.

Dr. J. B. Kenley

Gerald P. McCarthy

* W. R. Meyer

* Frank W. Nolen

Fred D. Rosi, Ph.D.

* Alson H. Smith, Jr.

* Claude Swanson

Fred W. Walker

* Richard A. Wolfe, Ph.D.

* These individuals concur in the general recommendations of the report, but have filed additional statements which follow.

Dissents

The following individuals dissent from this report, as indicated in their attached statements.

Elizabeth H. Haskell

Frank E. Wallwork

Statement of Watkins M. Abbitt, Jr.

I concur in general with this report and its recommendations, but I believe that 1 picocurie per liter (see recommendation #2) is too high a maximum for radon.

Statement of Alson H. Smith, Jr.

I generally support this report. However, I still have questions with respect to the need for standards as severe as those pertaining to no-discharge and non-degradation. While I feel that protection of our water resources is necessary, I am not sure that these measures are the best approach. Therefore, I will continue to consider what is the best approach to protection of our water resources as these recommendations are considered by the Coal and Energy Commission and the General Assembly.

Moreover, insofar as the uranium industry is comparable to other industries in the State, it should be treated so.

Statement of Richard A. Wolfe.

I concur in general with the recommendation that the uranium industry can be allowed in Virginia if certain standards are instituted. However, some of the recommended standards are far too stringent. The uranium industry should be regulated like any other industry insofar as it is like any other industry. If it can meet safe drinking water standards to ensure that the environment is protected without the severe requirements of non-degradation and no-discharge, less severe requirements should be imposed.

Statement of Claude Swanson

I agree that the moratorium can be lifted if specific laws and regulations are adopted. However, I would like to offer the following comments on the foregoing report.

Recommendation 4 - The state currently has an anti-degradation policy. Why do we keep changing the words? The idea is that we are going to treat the uranium industry the same as any other industry. If there is a hazard, let's correct it regardless of the business.

Recommendation 5 - Another old point is that this operation should be allowed to discharge process water if it meets state standards. This state already has lots of industries dealing with artificial chemicals that are allowed to discharge that are much more dangerous than nature's materials. If the state water standards needs tightening, then that is a problem to be examined another day.

Recommendation 7 - I feel that the Task Force has had a useful life and has done its job. I do not believe we need to make it a permanent organization. The US/UAG never agreed to continue the life of the Task Force. So I was surprised to see it included as a recommendation.

I would like also like to observe that the most important conclusion of the TMI was that the benefits outweighed the costs 26 to 1. That statement should be included since that was the most important result of that study.

Finally, I think the radiation risks used by SENES were average or generally accepted risks. Of course some people think the risks are overstated. We should not undermine the study by only pointing to the opponents - otherwise no one will even consider having x-rays.

To conclude, if the US/UAG really wanted to find industries that are hazards to the population of the Commonwealth, we should be looking elsewhere. I should add another simple thought that the uranium industry's hazards are radioactive and can be easily found unlike other modern business waste materials that we have learned to live with and manage.

Statement of Frank W. Nolen

I concur generally with the direction that the foregoing report would take the State. I believe that the uranium moratorium can be lifted, and I also agree that specific statutes and regulations need to be adopted to regulate this industry. Nevertheless, I do wish to make the following points to clarify my position with respect to the recommendations:

1. There are some recommendations which can be altered in such a way that the Subcommittee and UAG would not have to withdraw its support from its general recommendation (e.g., a redesignation of a lead agency).

2. I believe it is desirable, rather than essential, that Virginia become an agreement state.

3. The radon concentration standard should be an average of one picocurie per liter.

4. Except for matters pertaining to radionuclides, uranium operations should be treated the same as any other industry. In line with this philosophy, the uranium industry should be expected to comply with current anti-degradation water standards. Likewise, liability requirements and policies for this industry should be based on similar policies for other industries.

5. The discharge of process water from the mill and tailings water should be allowed if the water meets existing state and federal standards.

6. I would like to note that the Tayloe Murphy Institute projected a cost benefit ratio for the proposed Swanson project of 26 to 1.

7. The General Assembly should appropriate sufficient funds to ensure compliance with laws and regulations applicable to a uranium industry.

# COMMONWEALTH of VIRGINIA

*Division of Industrial Development*

Washington Building/Richmond, Virginia 23219
(804) 786-3791


MEMORANDUM

TO: Bernard Caton, Ph.D.

FROM: Scott Eubanks

DATE: November 8, 1984

SUBJECT: Draft Report of UAG

We believe your draft report accurately reflects the general positions taken by the U.S./UAG. It was a difficult task, no doubt, to produce this draft, and you and your associates are to be congratulated.

We have concerns about recommendation 4. First, the concept of non-degradation, in its most strict sense, seems unrealistic in any environment that is subject to activities by human beings. What is the meaning of non-degradation? No matter how well ameliorated, much of what we do in the normal course of living could be described as degrading to the environment. Second, the treatment of industry by state and local governments in their regulatory role needs to demonstrate the greatest degree of equity possible. If socioeconomic variances are allowed for some industries with regard to water regulations, then all industries should be allowed such variances.

PSE/dsh

THE COLLEGE OF WILLIAM AND MARY
Williamsburg, Virginia 23185
Chartered in 1693

November 5, 1984

Dr. Bernard Caton
Coal and Energy Commission
P.O. Box 3AG
Richmond, VA 23208

Dear Bernie,

I agree in general with the US/UAG draft report, but am still concerned about the 1 pCi/ℓ radon standard for additional exposure for the general public due to uranium facility operations. This standard represents an appreciable fraction, ≃100%, of average ambient background. It also may account for a fair fraction, ≃20%, of all nonsmoker lung cancer incidence, using NCRP #78 May 1984, risk estimates (§ 11.2.2 and Senes report, p. 3-4).

Although there are indications, (Radford report on Scandanavian miners in the July '84 New England Journal of Medicine and EPA estimates), that the above risk may be somewhat worse by a factor of x3 to x10, I got the impression in talking with Dr. Naomi Harley who chaired the NCRP report, that the NCRP estimates were based upon the most extensive work currently available. She also mentioned that a large scale concentration of 1 pCi/ℓ to the public would be vanishingly rare.

In view of this I would like to suggest setting ~1/3 pCi/ℓ or thereabout as a standard with the proviso that if widespread radon and radon daughter ambient levels, allowing for cyclic variation and averaged over a suitable time interval, begin to rise over a certain amount, say 0.1 pCi/ℓ, due to uranium facility operation, then appropriate agencies be notified. This emphasizes careful radon monitoring, a critical and key aspect of state regulation.

On a different matter, the total cost estimate, excluding consolidated lab work, of $850K for first year state regulation is similar to agreement state cost estimates of $300-500K made ≃10 years ago, adjusted to inflation.

Sincerely,

Herbert

HOF/dbf

Herbert O. Funsten

Department of Physics
(804) 253-4471

# COMMONWEALTH of VIRGINIA

**State Air Pollution Control Board**

ROOM 801, NINTH STREET OFFICE BUILDING
RICHMOND, VIRGINIA 23219
TELEPHONE: (804) 786-2378

W.R. MEYER
EXECUTIVE DIRECTOR

November 2, 1984

Bernard Caton, Ph.D.
Research Associate
Division of Legislative Services
P. O. Box 3-AG
Richmond, VA 23208

Dear Bernie:

The report reflects the position of the majority of the US/UAG members but exception is taken to the proposed radiation exposure standard as expressed in Item 2, Section II Recommendation. The general public should not be exposed to any higher radiation dose than necessary because a totally risk-free threshold cannot be identified. The International Commission on Radiological Protection (ICRP) has provided guidance to many countries that reflects this philosophy. ICRP recommends the establishment of dose limitations based upon the following three principles:

"1. No practice shall be adopted unless its introduction produces a positive net benefit;

2. All exposures shall be kept as low as reasonably achievable, economic and social factors being taken into account; and

3. The dose equivalent to individuals shall not exceed the limits recommended for the appropriate circumstances by the Commission."

The cost benefit study proposed by the Tayloe Murphy Institute provides information on the first principle. The second principle is commonly referred to as ALARA, an acronym for as low as reasonably achievable. The common interpretation of ALARA is that there is an appropriate degree of dose reduction, below the recommended individual dose limits, which should be determined by some form of cost benefit analyses. The ALARA principle has become a major objective of the practical application of radiological protection programs in many countries including the United States. Because of the many variables in applying this principle, it is most suited to be used on a case-by-case basis in a permit process. The

third principle, which cites a dose exposure limit, is necessary in applying the ALARA principle and is suitable for establishment by statute.

As stated in the US/UAG report, a uranium mill/mine can be built in Pittsylvania County with only a total of 0.04 additional fatal cancers likely for the population within fifty miles of the project during its thirteen years of operation. However, this is based on a total annual dose of 7.8 millirem per year from the proposed facility. Any increased exposure could well result in increased cancer. The proposed standard of 285 millirem per year would allow increased exposure. If the ALARA principle is established as part of the proposed radiation standard, this will not happen. In addition, the studies have shown that more stringent standards can be set. It seems persuasive to establish a performance standard which would be applied at the site boundary and this would limit exposure to the general public. Throughout the industry this limiting value is taken as one third of 500, or 170 millirem per year from particulate emission, excluding radon. It is recommended that a standard be established using the ALARA principle and in no case will the allowable radiation exposure exceed a total of 170 millirem per year. This equates to approximately 25 millirem per year from all sources except radon and 0.5 picocurie per litre from radon.

It is my understanding that the US/UAG at its October 24, 1984, meeting endorsed the Task Force Report with certain comments. This should be reflected in the report. On page 7 it is suggested that on line 5 the words "and the Task Force Report" be inserted after the words "this report."

Sincerely,

W. R. Meyer
Executive Director

WRM/bh

cc: E. H. Haskell
R. W. Burton
R. C. Collins
R. S. Stroube
W. W. Parks
K. C. Van Auken

Elizabeth H. Haskell
P.O. Box 3903
Martinsville, Virginia 24112

(703) 632-3865

COMMENTS ON THE US/UAG REPORT

A Different Perspective

I do not agree with the recommendation of the Uranium Subcommittee/ Uranium Administrative Group (US/UAG) that the moratorium on uranium development can be lifted.

The case for uranium mining and milling in Virginia has not been made, in my opinion, despite extensive studies by the US/UAG, consultants and the industry. The burden of proof is on those who wish mining to proceed and this burden has not been met for me. The risks of cancer deaths and illnesses from radiation released from the uranium ore and waste products called tailings are high in the state's proposal. The great many unknowns about the development and its impacts could push health risks much higher and raise costs to the Commonwealth, substantially reducing projected economic benefits.

If Virginia allows uranium mining and milling, it would be the first state to do so in a climate where rainfall exceeds evaporation and where many people would be exposed potentially to the resulting radiation in the water and air. Previous domestic uranium mining has been in arid, sparcely populated Western regions where transmission of radiation in water is not a concern. In Virginia's wet climate where water is discharged from the site and filters through tailings, the transmittal of radiation to people through streams and the groundwater is a major issue.

The experimental nature of the uranium industry in Virginia's wet climate and the environmental problems from radioactive tailings disposal in the West

have caused the General Assembly to be justifiably cautious in approving the industry. Legislation has called for the assessment of risks and benefits. The US/UAG has had no actual experience to evaluate. French uranium is cited by the industry as similar, but no impacts data were produced on this situation. Rather, the UTF and US/UAG reports and conclusions about costs, benefits and risks of a uranium industry are based on consultants predictions using mathematical models and other techniques to speculate about future effects of one mine and one mill. This site is known as the Swanson site in Pittsylvania County. No estimates were made of impacts of a statewide industry.

In my judgment, the consultants risk assessment study and cost/benefit analysis on which the UTF and US/UAG reports are based underestimate the health risks and overstate the benefits of the Swanson uranium mining and milling for the following reasons:

1.) The Swanson risk and cost/benefit calculations assume no negative impacts on ground water or surface waters. It is assumed that there will be no leaching of radioactive wastes or heavy metals to groundwaters that are used by neighbors, no substantial polluted discharges to streams, no accidents, no long-term deterioration or collapse of the 100 foot high tailings pile by flood, earthquake, erosion or design failure for the thousands of years the tailings are radioactive.

These are unrealistic assumptions in the net precipitation climate of Pittsylvania County, where groundwater reaches close to the surface and where above-ground tailings disposal will be required exposing the waste to weather and collapse. Mill Creek will be diverted around the site but no negative impacts are projected. An open-pit mine will be dug to 850 feet through the Chatham Fault and tailings disposed near the Bannister River, using an undemonstrated containment technology.

A VPI/SU professor consulting with the UTF concluded that virtually all contaminants that would be disposed in the proposed tailings pile will eventually leach to groundwater. When and how fast pollutants will filter out will depend on the thickness and material of the liner under the tailings pile.

If the study's assumptions are wrong and polluted groundwaters flow through the rock fractures to affect groundwater supplies or surface water pollution increases, then the risks and economic costs to individuals and the state would rise.

2.) The US/UAG report estimates that up to .56 additional cancer deaths will result from the one mine/one mill Swanson development in the 13 years of operation. This assumes that the maximum exposed individual will receive 7.8 millirems of radiation, based on the industry and state consultant estimates. However, the UTF and the US/UAG have proposed state standards that would allow 285 millirems of radiation to the maximum exposed person, which is estimated to produce up to 21 cancer deaths during the 13 years. It is reasonable to expect that if the law permits 285 millirems that the industry could emit up to that level.

If more than one mine and one mill is developed in Pittsylvania County or other parts of the state, additional people will be exposed and risks increase. To estimate the maximum cancer risk from a uranium industry, rather than just one mine and mill, calculations should be based on the proposed statutory total radiation standard of 285 millirems. This amount of radiation could produce anywhere from 28.5 to 399 additional cancer deaths in an average population of one million exposed persons. Various scientific

organizations have differing views about just how many cancer deaths to expect. The state's consultant used the lower extreme of 28.5, while other governmental scientific organizations predict up to 399 cancer deaths.

3.) Health risks, other than neighbors' cancer deaths, were not estimated for the Swanson development. Traditional risk assessment methods are limited to predicting fatal cancers in the general public. The following risks are reasonable to expect:

* Worker accidents, illnesses and deaths were not included in the risk assessment but were left to future analyses. In addition to the employee risks associated with any surface mining, they will be exposed to radioactive materials in the mine, mill and tailings areas.
* Illnesses in the general population, including cancer, that do not result in death, were not included.
* Impacts on sensitive persons, notably children and pregnant women, would be more substantial than the impacts on the average population projected.
* Health risks were based on normal, expected operating conditions and do not, because they cannot, predict effects of a catastrophic event such as a flood, major accident or design failure that could collapse the tailings pile.

4.) Benefits calculations assume that the Swanson mine and mill will operate at full production for the 13 years of expected operation, producing 468 full-time jobs, while the history of the industry is one of cyclical unemployment. Benefits to employees would decrease and costs to the Commonwealth increase if periodic unemployment occurs.

5.) No calculations were made by the consultants, UTF, or the US/UAG of the long-term health and environmental effects and costs to the Commonwealth, those that occur for many years after closure of the mine and mill. Risks, costs, and benefits are projected for only the 13 years of operation, although risks and costs will continue for many years after the 13 years of benefits cease.

The US/UAG estimates that first year costs to the Commonwealth to regulate the Swanson site to be $850,510. Recurring costs during mining operations are projected to be $664,410 a year. No post-closure costs are projected, although the General Assembly should expect some to occur. After closure, the Commonwealth or the Federal Government will assume permanent ownership of the tailings pile, along with the costs of monitoring and managing the site, and responsibility for damages and cleanup should an environmental problem occur. In the event the tailings management technology fails or a flood or earthquake occurs, a very expensive tailings remedy could be required.

These calculations of long-term costs and predictions of catastrophic events were not made by state officials because of the very high degree of uncertainty about such impacts of uranium mining and milling in Virginia. A great deal of hard work and investigation by legislators, state officials, private citizens and the industry has been devoted to improving our understanding of impacts of a Virginia uranium industry. The Swanson site-specific research was a valuable case study, which enabled the UTF to draft better uranium standards. However, while knowledge of a Virginia uranium industry has improved greatly over the past two years, uranium mining and milling in our climate and population density would be an experiment. Predicting impacts of such development are informed guesses, at best.

In my judgment, the unknowns and the identified risks to the public and the environment exceed the projected benefits and call for retaining the moratorium on mining and milling. This is a conservative approach that asks for a higher level of confidence before approving this unique industry.

However, if the General Assembly weighs the risks, costs and benefits differently, is willing to accept the uncertainties, and lifts the moratorium on uranium mining and milling, I endorse the US/UAG and UTF recommendations for legislation.

The total radiation dose standard should be made more protective for the public than the 285 millirems a year proposed in Recommendation 2 of the report. This proposal would expose an individual to the equivalent of 10 chest X-rays a year. This is added to the naturally occurring radon at the Swanson site of 130 millirems or about 5 chest X-rays, for a total of 15 X-rays each year of operation. In my view, this is too high a level of risk for Virginia to accept. Regulators hope to set lower exposure limits in the uranium permitting process, but lower levels should be specifically written into any uranium mining law. A better alternative standard is a total radiation dose standard of 25 millirems per year above background for sources other than radon and a concentration standard of 0.5 picocurie per liter for radon, for a total of approximately 170 millirems a year.

In addition the concept of setting radiation exposure limits in a uranium permit that are more stringent than the statutory limit (known as As Low As Reasonably Achievable or ALARA) should be specifically authorized in any uranium mining law, so that radiation limits below 170 millirems are possible.

A trust fund should be established in any authorizing statute to cover long-term state costs of monitoring and managing a closed tailings site, including

funds to pay for remedial action if a major environmental problem occurs. The mining companies and not the taxpayers of Virginia should bear this burden.

Elizabeth H. Haskell

Elizabeth H. Haskell
Member, Uranium Administrative Group

Bernard Caton, Ph.D.
Research Associate
Division of Legislative Services
P.O. Box 3 AG
Richmond, Va. 23208

505 Buena Vista Drive
Halifax, Va. 24558
November 3, 1984

Dear Dr. Caton:

I do not concur with the conclusion of the Uranium Task Force. I also do not agree to the text of recommendations two (2) and revised six (6) and suggest the inclusion of an additional provision.

It is my considered opinion the conclusion should have been "the moratorium shall be continued until such time as proven technology has been demonstrated which will comply with the recommendations derived from the work of the task force."

The reasons for rejecting the conclusion of the Uranium Task Force are briefly summarized as follows:

1. The technology to prevent seepage of radionuclides, heavy metals, or chemicals from the tailings area into the ground water has not been developed.
2. Risk assessment:
   a. The whole study is not totally reliable because it is premised on a level of limited radiation emission which I cannot conceive as being achievable during an actual uranium operation.
   b. The conclusions relate only to cancer mortality; no consideration given to incidence, nor any reference to any effects on pregnant women.
   c. Risk to workers at the facility is not evaluated.
   d. No assessment of a "worst case" scenario which should be of primary concern.
   e. No evaluation of risk after closure or during a tempoary shut-down.
3. Cost/Benefit Analysis:
   a. This study is premised on the proponent's projection of a full 350 day operation of the facility for 13 years. I cannot accept that premise and believe it is a fallacy to accept conclusions based on that premise.
   b. All of the costs are inherent to the program whether the facility operates at 100% capacity or 50% of capacity; the benefits are not. This adversely affects any benefits to cost ratio.

c. Many of the costs are not quantified particulary as they apply to the environment and effects on local agriculture and dairy operations.

d. Income to the state is overestimated. Corporate income tax will be minimal as Marline has prior significant losses which can be carried forward for ten (10) years to offset any potential profit. Because of the projected wage scale income from individual state income tax payments is overestimated.

e. Cost to the state to implement the necessary programs and subequent monitoring of those programs far exceeds the potential income.

The following comments are adressed to the recommendations:

Recommendation number 2: This provision allows for an exposure of 285 millirem per year and in my opinion generates too high a risk factor. The concentration of one (1) picocurie per litre above background for radon is too high, and should be reduced to at least one half (1/2) picocurie per litre and possibly less. Marline projects they can meet a tighter standard and it should be established.

Recommendation number 6 revised: The standard of five (5) picocuries per gram to determine when sub-grade ore and waste rock is to be treated as hazardous waste should be maintained. Sub-grade ore particularly creates an hazard and an additional risk factor.

As an additional provision, I suggest the tailings to be deposited at the Swanson site be restricted to the waste generated from the Swanson mine. I realize this suggestion was not considered to be a legislative decision, but bear in mind, if not implemented, the risk assessment considered only a two hundred (200) acre site.

I recognize that I am in the minority on the decision of the Uranium Administrative Group, but as you indicated in your letter of October 30, these comments will be attached to the final report.

Thank you for the opportunity to express my concern and disagreements. I also express my appreciation to you and the rest of the staff in keeping all members of the U. A. G. so well informed, and for the many courtesies extended to me personally.

Frank E. Wallwork

Frank E. Wallwork
Member of the U. A. G.

## Appendix I: Cost Estimates for a State Program to Regulate Uranium Mining and Milling

In an effort to acquaint the Coal and Energy Commission with the projected cost of a uranium regulatory program, agencies were asked to estimate their budget needs based on the draft legislation and the Task Force and US/UAG recommendations. These cost estimates are shown below. Since each agency prepared its projection separately, duplication likely exists. The agencies have been asked to continue to refine these throughout the rest of this year and during 1985.

| | 1st Year | Subsequent Years |
|---|---|---|
| 1. Department of Agriculture and Consumer Services | | |
| Sample collections | $1,000-$1,500 | $1,000-$1,500 |
| 2. State Air Pollution Control Board | | |
| Permit issuance | $17,470 | ------ |
| Routine inspections | $21,718 | $10,859 |
| Monitoring Equip. & Site Prep. | $17,500 | ------ |
| Sampling Network Operations | $11,200 | $11,200 |
| 3. Division of Mines | | |
| Inspector (with vehicle, etc.) | $50,000 | $40,000 |
| 4. State Water Control Board | | |
| 2 employee man-years (water sampling technicians) | $60,000 | $60,000 |
| 5. Division of Mined Land Reclamation | | |
| 1 geologist | $26,000 | $26,000 |
| 1 field inspector | $25,000 | $25,000 |
| 1 mining engineer | $26,000 | $26,000 |
| 1 attorney (contracted) | $55,000 | $55,000 |
| 1 stenographer | $13,500 | $13,500 |
| 1 mine staff assistant | $10,000 | $10,000 |
| sample analysis, overhead transportation, etc. | $45,000 | $45,000 |
| 6. Department of Health | | |
| Salaries & benefits: 5 employees | $171,450 | $171,450 |
| Contractual services | $137,000 | $62,000 |
| Supplies and materials | $ 20,000 | $20,000 |
| Continuous charges | $ 10,000 | $10,000 |
| Equipment | $102,400 | $30,000 |

7. Consolidated Laboratories

We are unable at this time to estimate these costs. One year ago, however, these costs were projected to be:

| | | |
|---|---|---|
| Capital equipment | $66,000 | ------ |
| Initial training and labor | $12,000 | ------ |
| Laboratory operating costs | | |
| Analysis labor | *$51,800 | $34,800 |
| Equipment maintenance | $ 1,000 | $ 1,000 |

* $51,800 reflects cost of pre-operational monitoring analysis labor; $40,000 has been estimated for the analysis labor cost of the first year of operation; and $34,8000 has been estimated as the analysis labor cost for subsequent years.

8. Council on the Environment

| | | |
|---|---|---|
| 1 staff person and support | $50,000 | $50,000 |