

December, 2004

## **Letter to Louisa County Board of Supervisors Regarding High-Level Waste at North Anna**

December 23, 2004

Louisa County Board of Supervisors  
1 Woolfolk Avenue  
PO Box 160  
Louisa, VA 23093

Dear LCBOS:

With Dominion discussing the potential construction of new nuclear reactors at the North Anna Power Station, the question of what will be done with additional high-level waste should be given serious consideration. The government continues to pursue its proposed national high-level waste repository at Yucca Mountain in Nevada, but recent court rulings, along with the accumulated scientific evidence, have cast increasing doubt on the U.S. Department of Energy's (DOE) ability to safely and permanently isolate high-level radioactive waste at this location.

As the problems of Yucca Mountain and its ability to serve as a repository have serious consequences for Louisa County and its residents, we hope the Board of Supervisors will give these issues due attention. North Anna's two operating nuclear reactors have already been granted license extensions by the U.S. Nuclear Regulatory Commission (NRC), meaning they will continue to produce waste for an additional 20 years. Before further steps are taken, and the licensing of any new reactors allowed, the effects of producing more high-level waste need to be seriously examined. Additional reactors at the North Anna Power Station, even if Yucca opens as a waste dump, will only mean more waste stored on-site in overcrowded and insecure irradiated fuel pools. Pools in such a state pose significant risks to the surrounding community in the case of an accident or terrorist attack.

Relying on Yucca Mountain to solve the serious problems surrounding high-level nuclear waste is naive. Even if Yucca was to open, it would not solve the long-term problems associated with continuing to produce high-level nuclear waste, nor would it significantly reduce the risks such waste poses, and will continue to pose, to the residents of Louisa County.

The following issues serve to increase longstanding doubts about the Yucca Mountain Project, its chance of opening, and its ability to protect public health and future generations. I hope you will give them appropriate consideration in your evaluation of the merits and demerits of constructing new nuclear reactors in Louisa County.

### **Recent Rulings Regarding Yucca Mountain**

Two recent judicial decisions have thrown DOE's self-imposed timeline for opening the proposed repository in 2010 into serious doubt. At the end of November, DOE announced that it will not submit its Yucca Mountain license application to the NRC in December 2004 as planned.

#### 1. Compliance Period for Safety Standard Determined to be Illegal

On July 9, 2004, the DC Circuit Court of Appeals ruled that the U.S. Environmental Protection Agency (EPA) illegally set a 10,000-year compliance period for radiation protection standards at Yucca Mountain. In the 1992 Energy Policy Act, Congress required the EPA to set public health and safety standards "based upon and consistent with" the findings and recommendations of the National Academy of Sciences (NAS), which was directed to identify the scientific bases for such standards at Yucca Mountain. The NAS study, which was issued in 1995, recommended "that compliance with the standard be measured at the time of peak risk, whenever it occurs." According to the DOE's own estimate, the peak risk period for Yucca Mountain will likely be on the order of several hundred thousand years. Until a new standard that protects the health of all generations can be set, and until the design for the Yucca repository can be adapted to meet the new, stricter standard, the submission of the license application — scheduled for spring 2005 — must wait.

#### 2. DOE Certification Incomplete and Premature

On August 31, 2004, an NRC Atomic Safety and Licensing Board (ASLB) ruled that the DOE had failed to make publicly available on the Internet all documents related to the Yucca Mountain Project, despite DOE's June 30 self-certification that this database had been completed. A full and comprehensive set of indexed documents is required by law to be available, via an NRC secure server, six months before a license application can be submitted. The purpose of posting all of the relevant Yucca Mountain documents online is to allow the public to review the materials and participate effectively in the Yucca Mountain licensing proceedings. This purpose cannot be achieved unless the website is fully functional and complete. Since this has not been done, DOE cannot legally submit its license application. It is unclear when DOE will attempt to certify again.

### **Inaccurate Claims**

With the proposed Yucca Mountain dump being such an issue lately, the pros and cons of the site have been much discussed in the press. Many opinion pieces argue in favor of opening a repository at Yucca Mountain, but they often rely on inaccurate claims to bolster their case. We have rebutted several of the most common below.

- **Claim:** Yucca Mountain will consolidate all high-level nuclear waste in one place, and thus result in its complete removal from reactor sites around the country, decreasing the risk posed to urban and suburban areas.

**Correction:** As long as we continue to use nuclear power, there will always be high-level nuclear waste at every operating reactor site around the country. Recently irradiated fuel, for instance, is required to decay on-site for five to ten years before it can be transported. Furthermore, waste storage at Yucca Mountain is legally and technically capped at 70,000 metric tons. Commercial nuclear power plants have already generated about 50,000 metric tons of waste, and if most plants continue operating and receive license extensions, this amount will likely double by 2035. Yucca Mountain will, as a result, simply not be capable of taking all the waste we have produced by the time it opens. Waste will be left behind for storage at reactors, much like the situation we have today. In fact, DOE itself has estimated that by the time that Yucca Mountain is filled, there will be approximately 42,000 metric tons of nuclear waste at 63 sites in 31 states – about the same amount of waste at most of the same sites as there is now. The only way we can significantly reduce the number of nuclear waste sites around the country is to stop making the waste.

- **Claim:** Yucca Mountain is deserted, and thus all other issues aside, is an appropriate site for a high-level nuclear waste repository.

**Correction:** People have always lived around Yucca Mountain, particularly Native Americans and farmers in the Amargosa Valley. The closest residents are less than ten miles away. Moreover, Yucca Mountain is located only about 80 miles northwest of Las Vegas - currently the fastest growing metropolitan area in the U.S. with a population approaching two million people. Between 1990 and 2000, the population in the three counties nearest Yucca Mountain grew by 88%.

- **Claim:** Nuclear power is necessary to address global warming and air pollution.

**Correction:** These issues can be addressed in many ways. While nuclear power plants do not release large amounts of greenhouse gases, they are by no means a pollution free source of energy. Reactors create significant amounts of radioactive waste, which is extremely long-lived and dangerous. Using nuclear power to address problems of global warming and air pollution would simply mean trading one dangerous waste for another. Renewable energy technologies address the same issues, but do not come with this waste problem. These technologies are capable of meeting our energy needs, and serving as base load generation if properly distributed.

Nuclear power is also prohibitively expensive to be used as the principle means of reducing CO2 emissions. According to a report released by the Rocky Mountain Institute, in order to reduce greenhouse emissions 20 to 30 percent by 2050, a coal-fired power plant would have to be replaced, and a nuclear reactor constructed, every one to three days for the next 40 years. The total cost would run as high as \$9 trillion. The sheer number, expense, and lag time of the nuclear plants that would be necessary led the British Government in 1995, after a year-long exhaustive review, to declare the unfeasibility of nuclear power as a solution

to global warming. The review concluded that nuclear power is one of the least cost-effective ways in which to cut CO2 emissions.

- **Claim:** Nuclear power will decrease our reliance on foreign oil.

**Correction:** Nuclear power is currently used only to generate electricity, and can not easily or directly replace oil, which is used primarily to fuel transportation.

Only 1.4% of our electricity is generated from oil. Nuclear power cannot meaningfully decrease our demand for oil in the near or medium term.

## Ongoing Scientific Concerns

The recent developments in the drive to open a nuclear waste repository at Yucca Mountain do not change the fact that other long-standing scientific concerns about the suitability of the site remain unresolved.

### 1. Seismic and Volcanic Activity

According to Nevada's Agency for Nuclear Projects, more than 600 seismic events registering over 2.5 on the Richter Scale have occurred within 50 miles of Yucca Mountain in the past 28 years. Thirty-three faults run through, or close around, the repository site. The largest earthquake to affect Yucca Mountain occurred in 1992 with a magnitude of 5.6. This is concerning, as seismic activity could cause the groundwater table to rise, submersing the stored waste or causing part of the repository to collapse, restricting access to broken canisters inside.

In addition, Yucca Mountain is bordered by inactive volcanoes, including one only about ten miles to the southwest. Although the principal volcanic eruption that created most of the landscape took place over 11 million years ago, the most recent volcanic activity occurred only 80,000 years ago. This is recent and pertinent in geologic time, and within the waste's hazardous lifetime. A future volcanic eruption, if it should occur, would disrupt rock in the area, and possibly allow magma heading to the surface to enter the repository. While the probability of volcanic activity may be low in the immediate future, activity is far more likely over the long period that the repository is intended to contain the waste.

### 2. Geologic and Hydrologic Conditions

Congress mandated in the Nuclear Waste Policy Act of 1982, when proposing an underground repository for the isolation of high-level nuclear waste, that the choice of a site be based primarily on geology. Yucca Mountain, however, does not have the geological characteristics necessary to play a significant role in containment. The site is located directly over an aquifer used for irrigation and drinking water, and its volcanic tuff is more permeable and wet than predicted.

The tuff, which was formed one layer at a time from volcanic activity, is brittle

and crisscrossed with cracks and fractures, through which water can easily flow if it gets into the rock. Some cracks extend from the surface down towards the proposed repository, and others run from the planned storage area all the way to the water table 1000 feet below.

While the DOE asserts that the tuff should not be a concern because of the dryness of the desert and the slow movement of water, this claim is not well supported. The site is not as dry as initially assumed. While the area receives only about six inches of rain annually, it is often in heavy downpours that cause erosion and flooding. Because of the intensity of this rain and the time it pools on the ground surface, water enters the mountain at a much higher rate than the U.S. Department of Energy (DOE) has predicted. In fact, in 1996, a radioactive isotope produced through nuclear bomb testing in the 1950s, was found inside Yucca Mountain at repository depth. The presence of this isotope indicates that water can penetrate the rock and move significant distances in less than 50 years, much faster than predicted.

The cracks and fractures inherent in the tuff of Yucca Mountain also will allow the future release of radioactive gases when the waste is no longer fully contained by the casks. The primary gas released will be carbon-14. This gas, when inhaled or ingested, it is absorbed into the bloodstream, reaching all organs of the body. As carbon-14 decays and releases ionizing radiation, moderate and prolonged internal exposure can result in cellular damage and lead to various forms of cancer.

### 3. The Storage Casks

With such geology, containment at Yucca Mountain relies primarily on engineered storage casks. Even under the most optimistic conditions, however, these casks are expected to fail long before the radioactivity of the waste has decreased to safe levels. There is also the possibility that the casks will corrode and fail far earlier due to the high temperatures of the repository, humid air, and deliquescent salts that will form on the cask surfaces. If such corrosion occurs, the casks could fail as quickly as several hundred years. Whenever the casks fail, prematurely or not, the waste will still be highly radioactive, and the geology of Yucca Mountain will not prevent this waste from contaminating the groundwater. Without the estimated benefit of long-lived containers, the groundwater protection standard for an individual would be exceeded as soon as 300 years after closure, with the peak dose occurring in only 2,000 to 3,000 years.

## **DOE Irresponsibility**

In addition to the above concerns, it is important to note that the credibility, integrity, and competence of DOE have been called into question many times since the Department was created. Substantial evidence continues to surface regarding DOE's inappropriate ties to the nuclear industry and repeated disregard for human health. The changing of DOE Suitability Guidelines for Yucca Mountain in 1999, the Department's financial

arrangements with contractors, and its continued mistreatment of workers at nuclear weapons plants and research facilities, are examples of this behavior. Because of this, it is important to be critical, and question the assertions and reassurances of the DOE. The sustainability of Louisa County, and the health of the people who live there, is important enough to warrant such an approach.

Unfortunately, issues of nuclear waste have been declared out of bounds by NRC for all licensing proceedings, and the recently released draft Environmental Impact Statement did not address the impact continued production and storage of nuclear waste at North Anna will have on Louisa County. We urge you to continue raising this issue, especially at the January 19 public meeting to discuss the draft EIS.

Sincerely,

Wenonah Hauter  
Director, Critical Mass Energy and Environment Program