

**A Summary of Key Findings  
from the National Academy of Sciences' report,  
*Uranium Mining in Virginia* (Final Rep. 2012)**



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**INTRODUCTION:**

- The National Academy of Sciences (“NAS”) completed a multi-year, \$1.4 million investigation, with public outreach to affected communities, on June 1, 2012. The study “examine[d] the scientific, technical, environmental, human health and safety, and regulatory aspects of uranium mining, milling, and processing as they relate to the Commonwealth of Virginia for the purpose of assisting the Commonwealth to determine whether uranium mining, milling, and processing can be undertaken in a manner that safeguards the environmental, natural and historic resources, agricultural lands, and the health and well-being of its citizens.” (Final Report, p. 32).
- The NAS Committee received presentations from industry advocates, impacted localities, conservationists, international experts in uranium mining/regulation, and the directors of Virginia DMME, DCR, and DEQ. (Final Report, p. 339-41). The Final Report was independently peer-reviewed.

**DOWNSTREAM IMPACTS AND LIMITED DATA ON BELOW-GRADE STORAGE OF RADIOACTIVE WASTE:**

- “Tailings disposal sites represent significant potential sources of contamination for thousands of years, and the long-term risks remain poorly defined. Although significant improvements have been made in recent years to tailings management practices to isolate mine waste from the environment, limited data exist to confirm the long-term effectiveness of uranium tailings management facilities that have been designed and constructed according to modern best practices.” (Final Report, p. 178).
- “Significant potential environmental risks are associated with extreme natural events and failures in management practices. Extreme natural events (e.g., hurricanes, earthquakes, intense rainfall events, drought) have the potential to lead to the release of contaminants if facilities are not designed and constructed to withstand such an event, or fail to perform as designed.” (Final Report, p. 179).
- “In a hydrologically active environment such as Virginia, with relatively frequent tropical and convective storms producing intense rainfall, it is questionable whether currently-engineered tailings repositories could be expected to prevent erosion and surface groundwater contamination for 1000 years” i.e., to the maximum levels required by Nuclear Regulatory Commission Regulations, 10 CFR Part 40. (Final Report, p. 189).

### **THREAT OF WATER CONTAMINATION:**

- “Because thorium-230 and radium-226 are present in mine tailings, these radionuclides and their decay products can—if not controlled adequately—contaminate the local environment under certain conditions, in particular by seeping into water sources.... This, in turn, can lead to a risk of cancer from drinking water ...” (Final Report, p. 124).
- “The decay products of uranium provide a constant source of radiation in uranium tailings for thousands of years, substantially outlasting the current U.S. regulations for oversight of processing facility tailings.” (Final Report, p. 125).

### **ACID MINE DRAINAGE:**

- “Acid mine drainage (AMD) has the potential to be one of the most serious environmental problems caused by uranium mining in the Commonwealth of Virginia if it is not appropriately managed and mitigated. ... Problems with AMD are nearly ubiquitous in the literature for uranium mines around the world, including sites in Australia, Germany, Ontario, Canada, Saskatchewan, Canada, Portugal, and Brazil ...” (Final Report, p. 181).

### **REGULATORY SHORTCOMINGS:**

- The U.S. “has only limited recent experience regulating conventional uranium processing and reclamation of uranium mining and processing facilities. Because almost all uranium mining and processing to date has taken place in parts of the United States that have a negative water balance (dry climates with low rainfall) federal agencies have limited experience applying laws and regulations in positive water balance (wet climates with medium to high rainfall) situations,” as found in Virginia. (Final Report, p. 224).

### **OVERARCHING CONCLUSION:**

- “There is only limited experience with modern underground and open pit uranium mining and processing practices in the wider United States, and no such experience in Virginia.” (Final Report, p. 276).
- In presenting the report to the Virginia General Assembly on December 19, 2011, Paul Locke, Chair of the NAS Committee, stated, “Internationally accepted best practices ... are available to mitigate some of the risks involved. However, there are still many unknowns. ... The report did not say you can mitigate all risks ... It said you can mitigate some risks.”