



NORFOLK

Questions & Answers

Re: Proposed Uranium Mine/Mill/Tails Facility in Virginia

What is a Uranium mine/mill/mill tailings storage facility?

An industrial production facility that includes: open pit or subsurface mining for ore; processing of the ore to separate the usable uranium from the rock in which it is contained; and milling by physical and chemical processes to concentrate the uranium oxide or yellow cake into a marketable product. Uranium is a very small percentage of the ore. The wastes from the milling process are referred to as tailings that are stored on-site forever. These radioactive wastes represent a serious public health and environmental threat for as long as they are stored.

Where is Uranium mined and milled currently in the United States?

Of the 50 states in the United States, only six states have any operating uranium mines today. Each of those states is located in the western portion of the United States in areas with very different weather, geology and nearby population density than found in the Commonwealth. These states are much drier and much less densely populated. If uranium is ever mined and milled in Virginia, it will become the first dedicated uranium mine/mill/tailings storage facility east of the Mississippi River. Currently mines are operating in Arizona, Colorado, Nebraska, Texas, Utah and Wyoming. These are all states with very arid weather conditions, unlike Virginia.

Where is the Uranium mine/mill/tailings storage facility being proposed in Virginia?

The current focus of Virginia Uranium is on the approximately 4,000-acre Coles Hill site in Pittsylvania County, near Danville and Chatham, that is in the Roanoke River watershed. Creeks on the property drain into waters that ultimately flow into Lake Gaston, a source of drinking water for much of south Hampton Roads. This is not the only location of uranium in Virginia. However, only the deposit at Coles Hill has been studied closely enough to fully understand its marketability. If a mill facility is constructed at Coles Hill, the economics of uranium mining in Virginia changes and the other deposits may become more attractive.

What's being proposed at Coles Hill?

Virginia Uranium, Inc. is proposing a complete uranium mining, milling and tailings storage facility with all of the activities previously described. Because the radioactive waste tailings will be stored on-site, regulatory agency monitoring of the site will continue to be required even if the site becomes inoperative at some future date.

Is there a way to understand how much waste product will be created with the proposed mine/mill/tails facility?

It takes 1,000 pounds of ore to produce 1 pound of uranium. If the Coles Hill site were to yield 100 million pounds of yellowcake it would generate approximately 50 million tons of mining waste, which retains 85% of its radioactive property for up to 300,000 years.

Is Uranium mining and milling safe and beneficial OR is it unsafe and detrimental?

There is no definitive yes or no answer to either question. No analysis is capable of offering conclusions without appropriate qualifications. There are inherent limitations of expertise and methods used by the experts on both sides who seek to answer these questions. The choices that must be made in Virginia therefore must be made with uncertainty.

What are the potential risks?

A catastrophic failure of a containment cell could potentially contaminate Lake Gaston, the primary source of drinking water for Virginia Beach. Currently, Lake Gaston water is pumped into Norfolk's reservoirs before it is transported to Norfolk's water plants where it is treated and distributed to over 850,000 people in Norfolk, Virginia Beach, Chesapeake and at local military installations. Norfolk's water could be protected from contamination due to a mining mishap by turning off the Gaston pumps; however, Norfolk is a regional water supplier and Lake Gaston water is a key component of the region's water supply. Those who depend on us for their water supply include: Norfolk residents and businesses, area military facilities, the entire city of Virginia Beach, much of Chesapeake, Portsmouth and Suffolk (during droughts) and Suffolk and Isle of Wight County in the near future.

Are there current laws and regulations for a Uranium mine/mill/tailings storage facility in Virginia?

No. Mining and processing uranium and storage of hazardous radioactive waste by-product in Virginia is very different from mining of coal or other minerals in Virginia and do not address the unique characteristics of uranium. There is no comprehensive program that exists in any of the Commonwealth's regulatory agencies that incorporates the necessary technical standards, public transparency, public health and safety, water and water supply protection, and long-term perpetual care inspection and oversight.

How many different government agencies are involved in regulating uranium mining, milling and tailings?

Many. Even though it is one large facility, other states treat each component as discrete operations for regulatory purposes rather than as a single industrial mine/mill/tailings storage facility that must handle and store hazardous waste. Under that structure, state government

agencies regulate the mining operation while the federal Nuclear Regulatory Commission (NRC) regulates ore processing (milling) as well as the disposal and storage of waste products (tailings) from the processing. A state can elect to operate a unified mine/mill/tailings storage regulatory structure by assuming oversight responsibility from the NRC, at its cost, if certain criteria are met. Virginia state agencies that would be involved include the Department of Health (radioactive material and drinking water issues), Department of Environmental Quality (air pollution, industrial storm water, wetlands, solid waste and production waste water discharge issues), Department of Conservation and Recreation (storm water runoff issues), and the Department of Mines, Minerals and Energy (mining operation and safety). Local government agencies would also be involved. While other federal agencies may be involved including the Environmental Protection Agency and the Mine Safety and Health Administration, the Commonwealth was delegated the authority for regulation in several of these areas long ago.

Can the state set standards more stringent than federal standards to reflect Virginia's unique "wet" environment for this mine/mill/tailings storage facility?

Yes, and if regulations are ever adopted, they should be more stringent to minimize the risk to human health and safety.

Are there standards that the General Assembly could include in a comprehensive Uranium mine/mill/tailings storage statute that would reduce the risk to our water supply?

Yes. If legislation is proposed, things such as requiring a low as reasonably achievable (ALARA) principle in all regulations, mandating an absolute non-degradation standard for groundwater, an absolute prohibition on discharge to surface waters, that liability issues be adjudicated by the courts rather than administrative bodies and requiring that the facility be regulated as a hazardous waste disposal facility are just some. It is important that many of these key issues be addressed in statute to avoid the vagaries of decision-making that come with change in gubernatorial leadership every four years.

So given that the state can develop a comprehensive regulatory framework with standards that are more stringent than the federal government, why not lift the moratorium on mining?

Because the water supply of southeastern Virginia is too critical to accept even a measured risk. For the citizens of Hampton Roads, the fear of radioactive contamination is so great that, even if the City could filter any radioactive elements that entered its drinking water supply due to a catastrophic failure, public opinion would require the City to close a contaminated lake or reservoir as a drinking water source. The citizens of Hampton Roads would not accept its source of water to be contaminated. A uranium mine/mill/tailings storage facility is a completely new and unfamiliar industry to the Commonwealth with dangers never before seen requiring an entirely new regulatory framework. The venue for testing a new experimental regulatory structure should not be in an industrial operation where the consequences of error could endanger the water supply for more than 900,000 customers.

What have other studies or research papers said about this proposed mine/mill/tails facility project?

The Virginia Coal and Energy Commission commissioned the National Academy of Sciences Uranium Mining in Virginia Study. Here are a few of its findings:

“If the Commonwealth of Virginia removes the moratorium on uranium mining, there are steep hurdles to be surmounted before mining and processing could be established in a way that is appropriately protective of the health and safety of workers, the public and the environment. There is only limited experience with modern underground and open pit uranium mining and processing in the United States, and no such experience in Virginia.”

“Uranium mining and processing carries with it a range of potential health risks to the people who work in or live near uranium mining and processing facilities.”

“Any exposure to the general population resulting from off-site release of radionuclides (such as airborne radon decay products, airborne radioactive particles, and radium in water supplies) presents some health risk. People living near uranium mines and processing facilities could be exposed to airborne radionuclides (e.g., radon, radioactive dust) originating from various sources including uranium tailings, waste rock piles, or wastewater impoundments.”

“Exposure could also occur from the release of contaminated water, or by leaching of radioactive materials into surface or groundwater from uranium tailings or other waste materials, where they could eventually end up in the drinking water supplies or could accumulate in the food chain, eventually ending up in the meat, fish, or milk products of the area.”

“Uranium tailings present a significant potential source of radioactive contamination for thousands of years, and therefore must be controlled and stored carefully... However, because monitoring of tailings management sites has only been carried out for a short period, monitoring data are insufficient to assess the long-term effectiveness of tailings management facilities designed and constructed according to modern best practices.”

“Furthermore, Virginia is subject to relatively frequent storms that produce intense rainfall. It is questionable whether currently engineered tailings repositories could be expected to prevent erosion and surface and groundwater contamination for as long as 1,000 years. Natural events, such as hurricanes, earthquakes, intense rainfall, or drought could lead to the release of contaminants if facilities are not designed and constructed to withstand such events, or if they fail to perform as designed. The failure of a tailings facility could lead to significant human health and environmental effects.”

“Extreme natural events (e.g., hurricanes, earthquakes, intense rainfall events, and 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.”

“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.”

“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.”

Have there been any studies on the economic implications of the proposed mine? Chmura Economics and Analytics Report on the Socioeconomic Impact on Uranium Mining and Milling in the Chatham Labor Shed said the following:

“The risks and rewards are not balanced and the adverse economic impact under the worst case scenario is nearly twice as great as the corresponding positive economic impact over the long term so long as the mine and mill operated for roughly ten years before environmental contamination reached the level assumed in this scenario. Under one scenario, the Coles Hill site unambiguously has a negative net economic impact no matter how long the site operates before environmental contamination reached the levels assumed in this scenario.”

What is Norfolk’s position on lifting the current ban on uranium mining?

Norfolk City Council approved its Legislative Priorities in January 2012 which includes the City’s opposition to lifting the ban.

“Norfolk’s opposition to the lifting of the moratorium on uranium mining in Virginia is predominantly predicated on the argument that the existing environmental and public health regulatory structure for traditional mining operations in the Commonwealth is fundamentally flawed. Uranium mining is a completely new and unfamiliar mining industry to the Commonwealth with never-before-seen dangers, and requires an entirely new regulatory framework.”

“To be effective, this new regulatory framework will be comprehensive and complicated, as compared to Virginia’s current mining regulatory structure. However, the venue for testing a new experimental regulatory structure and new uranium mining technology in a precipitous climate like Virginia should not be in a mining operation where the consequences of error would be catastrophic to such a vital and important water supply.”