

# Proposed Coles Hill, Virginia Uranium Mine and Mill: An Assessment of Possible Socioeconomic Impacts

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RTI examined the potential impacts of establishing a uranium mine and mill using a broad socioeconomic framework that considers not only impacts on employment, output, and income in the region, but also possible environmental impacts and impacts on government revenues and responsibilities. Key findings include the following:

- Overall, the proposed mine and mill present both potential risks and potential rewards to the study region. Rewards include an estimated addition of 724 jobs and \$162 million to the region's economy each year, for more than 20 years. Risks include both actual environmental risks and perceived risks that could hurt the region's reputation. Risks could be significantly reduced if appropriate investments are made in design, pollution control technologies, and regulatory development and implementation, and ongoing commitments are made to frequent monitoring and transparent communication. The costs of making these investments and keeping these commitments, and how they compare to the estimated returns from uranium mining and milling, are uncertain. If these investments are made, with diligent and transparent mechanisms for communication, there could be minimal adverse impact to the 50-mile radius study region. If investments such as there are not made across the board, the region has much to lose.
- The study region, a 50-mile radius around Coles Hill, Virginia, is an area with relatively low population density, a mild, wet climate, and an abundance of natural resources which have supported both a productive agriculture sector and ample outdoor recreation opportunities. Residents value these attributes, but also recognize the region's high unemployment rate and low educational attainment, relative to the rest of Virginia. They hope for new job opportunities that would make the region more prosperous and encourage population stability or growth. With regard to the proposed mine and mill, they are concerned about safety, find the promised jobs attractive, and feel they need more information about the project and its possible consequences.
- VUI hopes to mine the uranium deposits at a rate of 3,000 tons per day of ore, producing approximately 1.76 million pounds of yellowcake (U<sub>3</sub>O<sub>8</sub>) annually during years 1–21 of its operation, and producing less during pillar extraction in years 22–35. Although many of the details of the design and operation of the mine, mill, and waste management methods are still undetermined, VUI has stated that it expects to use underground mining (although surface mining has not been ruled out) and an alkaline leaching beneficiation process. Based on these plans, it would employ 324 workers, and hopes to hire up to 90% of its workforce locally.
- Even if the mine and mill meet or exceed regulatory standards, detectable concentrations of uranium and other constituents would be released from the facility into the surrounding environment. The releases would result in finite increases in risk to human and ecological health; the risks would be expected to be quite low if the facility adheres to regulations, and may not even be detectable.
- Mine dewatering would be necessary; the rate at which groundwater would need to be pumped out to dewater the mine is uncertain, but groundwater pumping would reduce

groundwater levels in the area around the mine, and could affect nearby wells, springs, and surface water bodies.

- The proposed mine and mill are in a climatic region with relatively high rainfall and exposure to hurricanes. Any facilities should be located well above the 100-year floodplain. Stormwater management facilities should be designed to minimize runoff and scaled to accommodate extreme weather events.
- RTI estimates that pollutant concentrations in surface water would decline rapidly with distance from the mine and mill due to dilution.
- Similarly, estimated airborne particulate emissions generally do not migrate far from the mine and mill; deposition of particulates and associated uranium mass is estimated to be less than 0.01 gm U<sub>3</sub>O<sub>8</sub>/m<sup>2</sup>/yr beyond 1 mile from the facility.
- Proper management and long-term isolation of tailings materials is critical, because water in contact with tailings will be contaminated with heavy metals and radiation, and the tailings will remain radioactive for thousands of years. Regulations require bottom liners and leakage detection systems for synthetic liner systems; experience with these systems at landfills indicates that they are generally effective in avoiding groundwater contamination, but they must be properly engineered, constructed, and maintained.
- If the proposed mine and mill become a reality, potential impacts to human and ecological health can be reduced by:
  - comprehensive and ongoing monitoring during operations of emissions and concentrations in media at the mine and nearby;
  - use of effective technologies to reduce emissions;
  - sustained focus on pollution prevention and reduction;
  - collaboration and transparency between the mining company, regulators, and citizens throughout the planning, operation, and closure stages; and
  - effective reclamation of the site.
- RTI's economic analysis estimates that construction and capital equipment purchase could briefly add from 559 to 1,008 jobs to the region, and increase regional output by \$70.5 million to \$137.7 million. Operation of the mine and mill could add from 385 to 889 jobs and increase regional output by from \$81.3 million to \$219.9 million annually during years 1–21 of the proposed project. Concerns about perceptions of risk or reduced quality of local products should be taken seriously; a simulation showed that a relatively small decline in demand for local sectors' goods and services could counteract the positive impact of the mine and mill.
- The proposed mine and mill would increase state and local tax revenues by an estimated \$11.2 million during operation, under the "reasonable" case scenario. These increased revenues would be accompanied by new responsibilities, including developing and effectively implementing a regulatory structure for the industry, upgrading some local infrastructure, and implementing state and local emergency response systems to respond to accidents and incidents at the mine.