HB2213 Gold Mining Study
Meeting of State Agency Component of Work Group
November 3, 2022
Buckingham, VA

AGENDA

9:00-9:15	Welcome and Introductions	Skiffington/Workgroup
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NOTE: The draft displayed below is a living document that will likely undergo several revisions before it is publicly released on December 1, 2022.

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Introduction/Executive Summary

To be drafted by Virginia Energy

Environmental justice concerns of potentially impacted (including downstream) communities

I. Environmental Justice Statutory Framework

The Virginia Environmental Justice Act ("VEJA") established that "[i]t is the policy of the Commonwealth to promote environmental justice and ensure that it is carried out throughout the Commonwealth, with a focus on environmental justice communities ("EJ communities") and fenceline communities."[1] The VEJA defines environmental justice as "the fair treatment and meaningful involvement of every person . . . regarding the development, implementation, or enforcement of any environmental law, regulation, or policy."[2] The VEJA goes on to define fair treatment as "the equitable consideration of all people whereby no group of people bears a disproportionate share of any negative environmental consequence resulting from an industrial, governmental, or commercial operation, program, or policy."[3] The VEJA defines an EJ community as "any low-income community or community of color."[4] The VEJA further defines a low-income community as one in which at least 30 percent of the population is classified as low income.[5] In addition to the VEJA, the Virginia Department of Environmental Quality's ("DEQ") policy statement includes a commitment to furthering environmental justice "in the regulatory and permitting process."[6]

Beyond the VEJA and DEQ's policy statement, HB2213 also requires the work group to consider whether existing air and water quality regulations are sufficient to protect air and water quality from gold mining and processing. This component of the study also has environmental justice implications. Air and water quality regulations are promulgated to protect human health and the environment and while these regulations are generally meant to protect all populations from pollution, we know there are certain pollutants for which no level of exposure is safe and that certain communities, including many EJ communities, have existing health concerns that may necessitate more stringent pollution controls. Courts evaluating environmental justice considerations and the protectiveness of National Ambient Air Quality Standards ("NAAQS") have determined that simply relying on NAAQS to conclude there are no disproportionate impacts where a proposed air pollution source will affect an EJ Community is insufficient.[7] Rather, an assessment of potential impacts to

[1] Va. Code § 2.2-235.
[2] Va. Code § 2.2-234.
[3] *Id.*
[4] Va. Code § 2.2-234.
[5] *Id.*
[6] Va. Code § 10.1-1183 (B)(4).
[7] [7] *See e.g.* National Ambient Air Quality Standards for Particulate Matter, 78 Fed. Reg. 3,086, 3110, 3160 (Jan. 15, 2013) (to be codified at 40 C.F.R. pts. 50, 51, 52, 53 & 58) (indicating that the particulate matter 2.5 (PM2.5) primary health-

surrounding communities must consider the risks of pollutant exposure faced by the community in question.[8] As the work group considers this aspect of HB2213, it must ensure that granular analyses are undertaken to determine the on the ground impacts of proposed extraction activities.

II. Virginia Lacks an Environmental Justice Regulatory Framework

While Virginia is fortunate to have the policy guidance and definitions provided by the VEJA, there is currently no regulatory framework to implement the requirements of the Act in any agency relevant to potential gold mining in the Commonwealth. In December 2021, the Virginia Attorney General issued an opinion stating that the VEJA is self-executing and noting that, under it, agencies are required to consider environmental justice in permitting actions.[9] Without a systematic process for agencies to incorporate meaningful involvement of EJ communities in decision making processes, and without clear guidance for evaluating whether pollution authorized under a permit will cause disproportionate impacts, the VEJA alone does not provide sufficient protection to EJ communities. The current regulatory void is a clear area that must be address if Virginia were to choose to allow gold mining and processing to occur.

While some state agencies, including DEQ, have stated goals of incorporating the requirements of the VEJA into their regulatory programs, no state agency that may regulate potential gold mining operations and processing has a currently formal structure for implementing the VEJA. To be sure, DEQ has considered environmental justice in certain specific permitting contexts, but it still lacks any regulatory framework for considering environmental justice for each of its regulatory and permitting programs. DEQ has created an Office of Environmental Justice tasked with ensuring "the fair and meaningful involvement of all people into the development, implementation and enforcement of environmental laws, regulations and policies across all DEQ programs."[10] DEQ's EJ Office has also recently hired outreach staff for its regional offices, although the Office Director recently resigned and it is unclear whether, and when, a new Director will be in place. DEQ's effort in creating and staffing its Office of Environmental Justice is a step in the right direction, but it still falls short of imposing any concrete protections for vulnerable communities. There are currently no state regulations that provide specific and concrete protections for EJ communities.

III. EJ Considerations in Buckingham County

Current gold prospecting is occurring in Buckingham County, an area that is home to several EJ communities. EPA's EJScreen tool shows that no portion of Buckingham County falls outside of

based standards for fossil fuel combustion may not be fully protective given that research suggested that there is no threshold at which harm would not occur.).

[8] *Friends of Buckingham v. State Air Pollution Control Board,* 947 F.3d 68, 92 (2020) ("The Board rejected the idea of disproportionate impact on the basis that air quality standards were met. But environmental justice is not merely a box to be checked, and the Board's failure to consider the disproportionate impact on those closest to the Compressor Station resulted in a flawed analysis.")

[9] Applicability of Va. Code §§ 2.2-234–235, Op. Att'ys Gen. 20-064 (2021).

[10] *Environmental Justice*, DEQ, https://www.deq.virginia.gov/get-involved/environmental-justice (last visited September 16, 2022).

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the low-income classification.[11] In fact, some portions of Buckingham County are classified in the 93rd percentile of low-income for Virginia.[12] Given that ongoing gold prospecting is already happening in an EJ community, Virginia must recognize that the need to evaluate public health protections and the sufficiency of Virginia's air and water regulations is more than just a hypothetical exercise. Any open-pit gold mining project would pose a serious threat to the Buckingham community and other localities in the state. Science has proven time and time again that an open-pit mine pollutes nearby rivers even when there is no accidental release of toxic mine waste[13]. This should be extremely alarming because the James River is only two miles away from the site where gold prospecting is currently occurring and serves nearly 2.7 million Virginians.[14] There is an imminent threat to the public health of those living in Buckingham County as well as those residents living in other geographical regions in the state if mining were to occur and the protection systems fail. This could release poisonous chemicals and by-products from mining activities into the James River.

With modern technology, gold mining involves drilling deep into the Earth, producing massive amounts of waste rock, tainted with dozens of compounds that, when exposed to the elements, can easily leach into the water table, streams and rivers. The waste may contain as many as three dozen toxins including mercury, arsenic, cyanide, lead, acids and petroleum by-products. Introduction of these chemicals into the environment may force EJ communities to consider relocation, which they cannot afford, and would endanger livestock, harm drinking water supplies, and continue the encroachment of further injustice on black and brown communities that threaten the enjoyment and ownership of their land. Further potential impacts and concerns relating to an open-pit mine on EJ communities include:

- Air pollution
- Continuous contamination and destruction of water, and the food chain
- Depletion of well water
- Toxic leaching into water sources, including streams, rivers and lakes
- Community exposure to heavy metals like lead, mercury and cyanide (Virginia currently has no regulations on waste caused by the use of cyanide in mining activities)
- Climate instability increasing potential hazards
- Destruction of hundreds of acres of land including farmlands that could be better utilized for food sovereignty

[11] *EPA's Environmental Justice Screening and Mapping Tool (Version 2.0)*, EPA, https://ejscreen.epa.gov/mapper/ (last visited September 16, 2022).
[12] *Id.*
[13] *See e.g.* South Carolina Department of Health and Environment Control's Board of Health and Environmental Control Enforcement Report (Nov. 10, 2021) (citing the Haile Gold Mine, Inc. for unpermitted discharges of free cyanide (CN) and total cadmium (Cd)) *available at*: https://scdhec.gov/sites/default/files/media/document/EA_EnforcementReport_November2021.pdf
[14] https://www.friendsofbuckinghamva.org/friends/press-release-gold-mining-pollution-threatens-buckingham-county/

- Unequal share of the burden on impacted communities: EJ communities bear the brunt of negative environmental consequence including loss of life, while reaping very little benefits either financial or increase in quality of life. There is a forever burden due to forever toxics caused by metallic mining. Virginia communities must be protected from toxic trespass.

While gold prospecting is currently occurring in Buckingham County, the Gold-Pyrite belt has a Broad geographic range in Virginia, including crossing or being upstream from many Virginia EJ communities. Therefore, there is a potential for gold mining and processing sites to intersect with and potentially affect many EJ communities throughout the Commonwealth. In order to meet their statutory obligations under the VEJA, state agencies must incorporate EJ considerations into their regulatory programs to regulate gold mining. The current regulatory framework for all state agencies is insufficient to guarantee EJ communities like Buckingham County meaningful involvement and protection from disproportionate impacts of pollution from gold mining and processing. If the Commonwealth were to allow gold mining and processing to occur, a robust regulatory framework to implement the VEJA would be a necessary prerequisite.

Environmental, ecological & human health concerns of potentially impacted (inc. downstream) communities

Section 3: Environmental and Human Health Concerns Inherent to Industrial Gold Mining

Risks to the environment and to human health occur at every stage of metal mining[15] and cannot be considered individually, as these risks often compound each other. Therefore, while this section will list various and separate risks that may occur during an industrial gold mining operation, it should be understood that any such operation may simultaneously produce multiple, or even all of the risks discussed.

3.1 Climate

Virginia's climate is significantly different from that of many Western states with active gold mining industries.[16] Virginia receives substantially more annual rainfall than many of these states, and climate change is expected to increase intensity, frequency, and duration of precipitation, among other things, in the Southeast.[17] Best practices that are utilized in Western states, such as the standards developed by the Initiative for Responsible Mining Assurance (IRMA), should not be

[15] ANN S. MAEST, THE POTENTIAL ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF GOLD MINING IN VIRGINIA 4 (June 24, 2022) (submitted to the NASEM Committee on the Potential Impacts of Gold Mining in Virginia).
[16] *Id.* at 14–15.
[17] For a summary of impacts especially relevant in the Southeast, see LYNNE CARTER ET AL., IMPACTS, RISKS, AND ADAPTATION IN THE UNITED STATES: FOURTH NATIONAL CLIMATE ASSESSMENT, VOL. II, 245–808 (Reidmiller et al., eds. 2019).

assumed to be safe in Virginia given these differences. Additionally, increased precipitation in areas with historic metal mining has been shown to increase the mobility of legacy contaminants, like lead, as floodwaters take-up and transport toxins,[18] and preliminary research shows a connection between extreme storm events and increases in concentrated releases of acidic drainage produced by mines (also known as acid mine drainage, or AMD).[19]

Failure to account for climatic conditions at a mining site and to adequately plan for vulnerabilities to, and changes in, extreme precipitation, drought, and temperature that are associated with climate change presents a significant risk to gold mining operations and surrounding communities and ecosystems.

3.2 Water Contamination and Usage

Mine drainage often contains toxic materials, and releases from mining operations can contaminate the surrounding environment. Contamination of mine drainage occurs due to the attributes of the mineral deposits and surrounding geology, as well as from the use of chemicals during mining operations.[20] Many of the mineral deposit types present in Virginia can result in AMD, and AMD has already occurred at previous mine sites in the state.[21]

AMD can also be accompanied by leaching of metals and other mine-related contaminants. Lead is a contaminant of potential concern based on the gold deposits likely to be found in Virginia.[22] While mercury is not generally used in modern gold mining operations, naturally occurring mercury may become remobilized through mining activities.[23] Mine drainage in Virginia may also contain naturally occurring uranium.[24]

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[18] S. Foulds et al., *Flood-Related Contamination in Catchments Affected by Historical Metal Mining: An Unexpected and Emerging Hazard of Climate Change*, 165 SCI. TOTAL ENV'T 476–77 (2014).

[19] Krik Nordstrom, *Acid Rock Drainage and Climate Change*, 100 J. OF GEOCHEMICAL EXPLORATION 97 (2009).

[20] See ANN S. MAEST, THE POTENTIAL ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF GOLD MINING IN VIRGINIA 22–23 (June 24, 2022) (submitted to the NASEM Committee on the Potential Impacts of Gold Mining in Virginia), for contaminants of potential concern for gold and base metal deposits in Virginia.

[21] *See e.g.*, Hammarstrom et al., *Geochemical and Mineralogical Characterization of the Abandoned Valzinco (Lead-Zine) and Mitchell (Gold) Mine States Prior to Reclamation*, U.S. Geological Survey Scientific Investigations Report (2006).

[22] ANN S. MAEST, THE POTENTIAL ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF GOLD MINING IN VIRGINIA 23 (June 24, 2022) (submitted to the NASEM Committee on the Potential Impacts of Gold Mining in Virginia).

[23] State Agency Committee Meeting 2, Erica Schoenberger Presentation (Mar. 25, 2022), https://energy.virginia.gov/mineral-mining/GoldMiningStudy.shtml; State Agency Committee Meeting 4, Steven Emerman Presentation (May 16, 2022), https://energy.virginia.gov/mineral-mining/GoldMiningStudy.shtml; ANN S. MAEST, THE POTENTIAL ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF GOLD MINING IN VIRGINIA 18, 22–23 (June 24, 2022) (submitted to the NASEM Committee on the Potential Impacts of Gold Mining in Virginia).

[24] ANN S. MAEST, THE POTENTIAL ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF GOLD MINING IN VIRGINIA 17 (June 24, 2022) (submitted to the NASEM Committee on the Potential Impacts of Gold Mining in Virginia); State Agency Committee Meeting 5, Ann Maest Presentation (June 23, 2022), https://energy.virginia.gov/mineral-mining/GoldMiningStudy.shtml.

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Other constituents may be introduced into mine drainage through mining operations. Blasting, which is required at almost all gold mining operations, may introduce ammonium nitrate-fuel oil into the environment.[25]

Contaminated mine drainage is known to have adverse effects on human health and the environment, and mining operations and associated drainage can have widespread impacts on ecosystems. [*List the adverse effects*].

The hydrologic characteristics of Virginia mean that gold mining activities are likely to occur close to both groundwater and surface water resources, increasing the possibility of contamination. Drinking water intakes located downstream of Virginia's Gold-Pyrite Belt serve over 3.5 million Virginians,[26] and over 700,000 Virginia residences rely on drinking water from private wells that are not subject to drinking water testing or standards.[27] While some of the pollutants associated with gold mining have drinking water standards, some of these standards are secondary drinking water standards, including for sulfate, meaning they are non-enforceable guidelines.[28]

AMD requires long-term wastewater treatment, and the most common type of water treatment used at mines with AMD is lime precipitation.[29] Lime precipitation, however, does not effectively remove many of the contaminants of concern associated with gold mining, including sulfate, nitrate, or ammonia; as a result, additional water treatment circuits would be required to remove uranium, selenium, and mercury.[30] In particular, Virginia's sulfate groundwater criteria may be difficult to maintain if sulfate ore containing gold is processed at an industrial scale in Virginia and adequate water treatment techniques are not employed. Long-term, if not perpetual, water treatment may be required when mined materials have moderate or high acid drainage and leaching potential, when there is a hydrological connection between mine water (for example, in pits or underground) and surrounding water resources, when there are waste rock seeps, or when there are draining cyanide and acid heaps.[31]

Gold mines are often large water users,[32] and there is limited oversight of well drilling and groundwater withdrawal in Virginia. Currently, a state groundwater withdrawal permit is only

[25] ANN S. MAEST, THE POTENTIAL ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF GOLD MINING IN VIRGINIA 8–9 (June 24, 2022) (submitted to the NASEM Committee on the Potential Impacts of Gold Mining in Virginia); State Agency Committee Meeting 5, Ann Maest Presentation (June 23, 2022), https://energy.virginia.gov/mineral-mining/GoldMiningStudy.shtml.

[26] *Id.* at fig. 6; *id.* at tbl. 2.

[27] State Agency Committee Meeting 3, Lance Gregory Presentation (Apr. 22, 2022), https://energy.virginia.gov/mineral-mining/GoldMiningStudy.shtml.

[28] EPA, *Drinking Water Regulations and Contaminants* (Feb. 17, 2022), https://www.epa.gov/sdwa/drinking-water-regulations-and-contaminants.

[29] ANN S. MAEST, THE POTENTIAL ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF GOLD MINING IN VIRGINIA 23 (June 24, 2022) (submitted to the NASEM Committee on the Potential Impacts of Gold Mining in Virginia).

[30] *Id.*

[31] *Id.* at 31.

[32] Initiative for Responsible Mining Assurance, IRMA Standard for Responsible Mining, IRMA-STF-001, 69–76 (June 2018).

required in Eastern Virginia or Eastern Shore Groundwater Management Areas of Virginia for new groundwater withdrawals exceeding 300,000 gallons per month.[33] The Gold-Pyrite belt in Virginia does not intersect these Groundwater Management Areas, meaning groundwater withdrawals associated with gold mining would likely be unregulated. Surface water withdrawals are regulated by DEQ under its Virginia Water Protection Permitting Program[34] However, the program includes a number of permitting exclusions. Changes in water flows due to gold mining-related withdrawals may also affect drinking water intakes downstream of mining operations.

Virginia's mineral mining regulations require that mining activities "be conducted so that the impacts on water quality and quantity are minimized," but they lack any baseline monitoring and sampling provisions that would enable detection of changes to water quality and quantity.[35]

3.2 Cyanide Usage

Cyanide is likely to be used for beneficiation (removing gold from ore) by gold mining operations in Virginia due to the presence of oxidized and sulfide-rich gold ores in the Commonwealth.[36] Cyanide solutions can have extremely high mercury concentrations, and cyanide concentrations may persist for at least a century in some media.[37] Uncontrolled cyanide releases have caused fish kills and contaminated downgradient groundwater near gold mining sites.[38]

In one study of a community living near a gold mine, researchers found a higher prevalence of headaches, dizziness, skin irritation and eye irritation among those exposed to environmental cyanide. [39] Moreover there are additional risks from exposures to copper, arsenic, mercury and lead that may also be mobilized in the processing of gold.

Virginia currently does not regulate many of the chemicals used in gold mining operations, including cyanide[40]. Montana and Wisconsin have banned the use of cyanide heap leaching in gold mining operations.

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[33] 9 VAC 25-610-50(1).

[34] 9 VAC 25-210-300 et seq.

[35] 4 VAC 25-31-360.

[36] ANN S. MAEST, THE POTENTIAL ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF GOLD MINING IN VIRGINIA 7 (June 24, 2022) (submitted to the NASEM Committee on the Potential Impacts of Gold Mining in Virginia); State Agency Committee Meeting 5, Ann Maest Presentation (June 23, 2022), https://energy.virginia.gov/mineral-mining/GoldMiningStudy.shtml.

[37] ANN S. MAEST, THE POTENTIAL ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF GOLD MINING IN VIRGINIA 7–8 (June 24, 2022) (submitted to the NASEM Committee on the Potential Impacts of Gold Mining in Virginia).

[38] *Id.*

[39] Hassan, N.A., Sahani, M., et. al., *A Study on Exposure to Cyanide Among a Community Living Near a Gold Mine in Malaysia,* Journal of Environmental Health, 2015 Jan-Feb;77(6):42-8.

[40] NASEM Open Session One, James Golden (December 15, 2021), https://www.nationalacademies.org/event/12-15-2021/potential-impacts-of-gold-mining-in-virginia-open-session-1

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3.3 Impoundments

Gold mining operations produce large amounts of waste—on average, almost three tons of waste rock is produced for every ton of gold ore recovered.[41] Large-scale surface impoundments are used to store mining waste, and many are constructed from low-grade materials, including waste materials.[42] The saturated nature of the wastes held in many gold mine impoundments means they are similar to coal ash impoundments.[43] These impoundments are generally permanent facilities that require inspection, monitoring, and maintenance in perpetuity.[44] There is a risk of leakage, overtopping, and failure at gold mine impoundments given the long timescale over which they operate, and this may lead to catastrophic impacts to downstream and downgradient communities.[45] Studies have shown that leaks from impoundments can contaminate surrounding groundwater and surface water regardless of whether the facilities is lined or unlined,[46] and overtopping of impoundments may become more frequent as precipitation increases due to climate change. Furthermore, 75 percent of mining disasters are due to catastrophic tailings dam failure.[47]

Risks to human health from impoundment failure are similar to those discussed in Section 3.1, with the added concern that past impoundment failures have killed hundreds of people by burying them under the waste the impoundments were meant to hold back.[*CITATION Brumadinho (and others?)*] In those instances, the impacts to ecosystems [*fill in here and cite*].

3.4 Community Impacts

Although gold mining could potentially occur in any area of the Commonwealth, Virginia's Gold-Pyrite Belt and other gold ore deposits are generally located in the Piedmont region. Many of the communities in this area are rural and agricultural in character. In addition to the direct effects of mining exploration and operations on human health, air, water, and environmental quality, industrial gold mining could affect nearby communities' health and character through indirect and cumulative impacts.[48] Industrial gold mining will disturb the rural characteristics of an area through increased noise and light pollution, large-scale removal of vegetation and habitat degradation, and higher

[41] State Agency Committee Meeting 4, Steven Emerman Presentation (May 16, 2022), https://energy.virginia.gov/mineral-mining/GoldMiningStudy.shtml.
[42] Zongjie Lyu, *A Comprehensive Review on Reasons for Tailings Dam Failures Based on Case History*, 2019 ADV. CIV. ENG'G art. No. 4159306, 2 (2019).
[43] ANN S. MAEST, THE POTENTIAL ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF GOLD MINING IN VIRGINIA 7 (June 24, 2022) (submitted to the NASEM Committee on the Potential Impacts of Gold Mining in Virginia).
[44] State Agency Committee Meeting 4, Steven Emerman Presentation (May 16, 2022), https://energy.virginia.gov/mineral-mining/GoldMiningStudy.shtml.
[45] ANN S. MAEST, THE POTENTIAL ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF GOLD MINING IN VIRGINIA 7 (June 24, 2022) (submitted to the NASEM Committee on the Potential Impacts of Gold Mining in Virginia).
[46] *Id.*
[47] State Agency Committee Meeting 2, Erica Schoenberger Presentation (Mar. 25, 2022), https://energy.virginia.gov/mineral-mining/GoldMiningStudy.shtml.
[48] *See* THOMAS MICHAEL POWER, LOST LANDSCAPES AND FAILED ECONOMIES: THE SEARCH FOR A VALUE OF PLACE ch. 4 (1996).

amounts of traffic.[49] Property values may decrease, in turn decreasing property taxes.[50] Other industries, including agriculture, and businesses in communities may also be negatively impacted by the environmental consequences of chemical contaminants and waste.

The boom-bust cycle of mining may exacerbate gold mining's impacts on local communities.[51] Advertised employment opportunities may be overestimated in mining proposals due to uncertainties of operations, as the number of workers required for a project depends on the size of the mineral reserve, the future of mineral pricing, and the total costs of mining.[52] Furthermore, mining jobs for these types of operations often require highly specialized technical skills that many local community members will not have, meaning the jobs may be given to workers coming from outside the host community.[53] While there is a possibility the community may receive short-term economic benefits from the flow of disposable income from these workers, many mineral mines are in isolated areas with sparse commercial development; therefore, there may be limited opportunities for these communities to convert this short-term cash flow into longer term benefits.[54] Furthermore, the high costs of environmental remediation have the possibility to completely offset any short-term, localized economic benefits from disposable income flows.[55]

Given the legacy of contamination from abandoned gold mines in Virginia, as mentioned in Section One of this report, it is clear that the environmental and societal costs of mining often materialize after mining stops. The boom-bust cycle of the gold mining industry means mining operators may cease to exist over the period necessary to fully implement closure, reclamation, and post-closure management of a mining site. Further, the long-term commitments and contingencies needed to remediate these sites—often in the face of unexpected environmental impacts—means reclamation and post-closure care can be extremely expensive and time intensive. Without adequate closure, reclamation, and post-closure management requirements and sufficient financial assurances, these costs will be borne by the public instead of mine operators.

3.5 Voices of Virginia

The issues most frequently raised by committee members and members of the public related to impacts on water quality and quantity from gold mining activities. During meetings, over 35 comments were made that related to mine drainage and water impacts. As of September 23, 2022, at least 68% of Town Hall comments (58 individuals) referenced impacts to water resources. In addition to water quality concerns, commenters also expressed concerns about water usage by gold mining operations.

[49] *See id.* at 112.
[50] *See id.*
[51] *See id.* at 102–11 (1996).
[52] *Id.* at 107.
[53] *Id.* at 108.
[54] *Id.* at 108–09.
[55] *Id.* at 112.

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Several state agency committee members and members of the public raised concerns about the long-term storage of mining waste and the leakage or failure of tailings dams. A few commenters raised the issue of air pollution from blasting activities during meetings, with at least one raising concerns about particulate matter. Concerns raised about the health and safety of mine workers, as well as residents, pets, and livestock near the mine included concerns about particulate pollution from mining operations. These concerns are echoed in written submissions on Town Hall; at least 11 comments were concerned about public health, 9 comments were concerned about air pollution effects, and 3 comments concerned about worker safety.

Six commenters during meetings raised concerns that increased precipitation rates in Virginia will elevate the risk of toxic releases and other environmental impacts from gold mining operations in the state and that concern is echoed in Town Hall comment submissions as well.

Commenters raised a variety of concerns about impacts of a gold mining operation on nearby communities, including lack of public notice or participation in the permitting process; changes to the rural character and bucolic nature of communities; increases in community infrastructure costs, including increases in traffic; decreases in property value; issues of mine worker safety; and economic volatility or job loss once mining operations close due to the boom-bust cycle of the extraction industry. Some commenters connected community impacts to concerns that bonding will be insufficient to protect communities, that fines and penalties for violations should be increased, and/or that there may be enforcement issues related to limited staffing capacity or agency resources.

Fifteen commenters raised concerns during meetings associated with the closure and reclamation of mining sites, as well as the adequacy of Virginia's current financial assurance requirements for mineral mine operators. An equal number of written comments on Town Hall did as well.

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Existing State Permitting Processes Relating to the Mining and Processing of Gold

The Virginia Department of Energy (Virginia Energy)

Virginia Energy's Mineral Mining program's goal is to provide for the safe and environmentally sound production of Virginia's non-fuel minerals.

The General Assembly enacted the first mine safety and reclamation laws in 1969. In 1985, the Department of Mines, Minerals and Energy (DMME) was formed as the result of a state government reorganization. The Division of Mineral Mining was located within DMME until the agency changed its name in 2021. The Mineral Mining program within Virginia Energy currently administers and enforces the Mineral Mine Safety Act and the Mineral Mine Reclamation Law under Title 45.2 of the Code of Virginia. As discussed in the introduction, large scale gold mining has not taken place since the 1940s. As such, existing mineral mine regulations were not drafted with gold mining in mind.

Some of the other state and federal regulatory agencies that oversee the development and operation of mineral mines are the Department of Environmental Quality (discussed below), the Virginia Department of Transportation, the Virginia Marine Resources Commission, the United States Army Corps of Engineers and the federal Mine Safety and Health Administration.

Statewide, there are currently 427 mineral mines covering about 76,000 acres. These include mines producing construction materials, industrial minerals, and other products. A large portion of the minerals mined in Virginia are extracted for the construction of roads and commercial and residential buildings. However, other minerals are produced for use in manufacturing, agriculture, industrial applications, food production, landscaping and jewelry. In 2021, over 72 million tons of non-fuel minerals in Virginia and contributed approximately $1.6 billion to the economy while providing over 6,600 direct jobs in the Commonwealth.[56]

The Mineral Mining program issues mining licenses and permits, and conducts regular environmental and safety inspections. If complaints or serious accidents occur at a mineral mine, Virginia Energy inspectors will conduct investigations to determine what happened and what can be done to prevent a reoccurrence of the problem. The agency also provides safety training and other assistance to mine operators, contractors, and stakeholders.

Before a mine license and permit are issued, applicants must provide suitable operations plans, drainage and sediment control plans, groundwater impact assessments, and reclamation plans for the proposed mine operation.

Operations plans must describe how the mineral will be mined and processed, and how waste will be disposed of while minimizing the effect on the surrounding environment. Regulations require the operations plan to facilitate integration of reclamation with mining operations according to the special

[56] https://energy.virginia.gov/geology/MineralResources.shtml

requirements of individual mineral types. Operators are required to conduct mining such that the amount of disturbed acres are minimized, and reclamation is to be conducted simultaneously with mining to the extent feasible. Regulations further require that mining activities must minimize the impact on water quality and quantity.

The operations plan shall include a description of the proposed method of mining and processing; the location of top soil storage areas; overburden, refuse, and waste disposal areas; stockpiles, equipment storage, and maintenance areas; cut and fill slopes; and roadways. The operation plan shall address plans for the storage and disposal of scrap metal, scrap tires, used lubricants, coolants, and other equipment service products, batteries, process chemicals, trash, debris, and other hazardous materials. The operation plan shall also include all related design and construction data.

The drainage plan shall consist of a description of the drainage system to be constructed before, during, and after mining; a map or overlay showing the natural drainage system; and all sediment and drainage control structures to be installed along with all related design and construction data.

The reclamation plan shall include a statement of the planned land use to which the disturbed land will be returned through reclamation, the proposed actions to assure suitable reclamation, and a time schedule for reclamation. The method of grading; removal of metal, lumber, and debris, including processing equipment; buildings; and other equipment relative to the mining operation and revegetation of the disturbed area shall be specified. Reclamation plans for underground mines shall include plans for closing or securing all entrances to underground workings.

In addition to these plans, a permit application must also contain a map. The map must show required features on the mine site, and sensitive features within 500 feet of the permit boundary. Sensitive features include state waters, cemeteries, oil and gas wells, underground mine workings, public utilities and utility lines, buildings, roads, schools, churches, and occupied dwellings.

The initial permit application requires that all property owners within 1,000 feet of the permit boundary be notified that a mine license has been requested. Those persons may request a public hearing as part of the permit review process.

Adjacent property owners often ask about screening and set-backs. Screening is required to improve the appearance of the mine site from public roads, public buildings, and occupied dwellings. Screening also helps to reduce the effects of noise and dust. Screening may be provided by earthen berms, walls, fences, planted barriers, or undisturbed forest. In addition, no cut or fill slopes are allowed within 25 feet of an adjacent property boundary without the written permission of the property owner and no disturbance of any kind is allowed within 5 feet of an adjacent property owner.

Upon review and approval of the mine operations plan, a performance bond must be furnished by the permittee to insure final reclamation of the mine site. The required bond is $3000 per disturbed acre. Bond must be posted before acreage is disturbed and will not be refunded until reclamation meets the approved post mining land use.

Drainage and sediment controls must be installed before any other land disturbing activities. Internal roads and yards must be maintained to control dust and prevent tracking onto state roads. Blasting must be designed to prevent dangerous off-site effects, supervised by certified persons, and monitored with seismographs.

After permitting, the site is inspected for compliance with the approved mine operations plan and the mineral mining laws and regulations. In most cases, two inspections are made each year for safety and health and environmental compliance.

The Mineral Mining program has:

- the right to access a mine for unannounced inspections,
- the ability to take enforcement actions to require compliance with the law and regulations, and
- the authority to revoke a permit and forfeit bond, if necessary.

Mine employees and stakeholders have the right to contact the Mineral Mining program with safety or environmental complaints. Complaints must be kept confidential to protect the individuals making them. All complaints require an investigation by mine inspectors.

State laws and regulations allow Virginia Energy to oversee most of what takes place on a mine site, but they do not address things such as:

- Land use or zoning.
- Hours of operation.
- Offsite noise levels.
- Traffic on public roads.

These topics are generally regulated by the locality in which the mine is located.

<u>Department of Environmental Quality (DEQ)</u>

DEQ administers many of Virginia's environmental permitting programs. This includes programs under the Clean Air Act (CAA), Clean Water Act (CWA) and the Resource Conservation and Recovery Act (RCRA) which have been delegated to DEQ by the Environmental Protection Agency (EPA) and include essentially the same environmental requirements for regulated activities. These major delegated programs would address any regulated air emissions, point source (wastewater/stormwater) discharges to state waters, and solid and hazardous waste management, storage and disposal requirements. In addition to the federally delegated programs, DEQ also administers several state only permitting programs including the Virginia Water Protection Program (wetlands), Groundwater Withdrawal, and Virginia Pollution Abatement (VPA).

A specific gold mining project proposal and permit applications would be needed to accurately identify all required permits. Some likely permit programs that could apply to mining activity includes:

- Virginia Pollutant Discharge Elimination Program (VPDES) permit for any process or stormwater point source discharges to state waters. This permit process includes evaluation of proposed effluent pollutant concentrations, discharge volumes and treatment systems, and the proposed receiving stream conditions to develop protective permit limitations. These limitations can include technology based, industrial sector, best management practices and water quality based requirements to ensure protection of state waters.
- New Source Review (NSR) permit for any stationary sources emitting regulated air pollutants in quantities requiring permit coverage. This permit may contain requirements to control criteria, hazardous or toxic air pollutants as well as best management practices and operational controls. All NSR permits require stationary sources to utilize the best available control technology (BACT) for any regulated air pollutants.
- Virginia Water Protection Program (VWP) permit may be required depending on the location of a proposed operation and water use needs. If wetland areas are impacted, a permit is required to avoid and minimize impacts to the extent practicable and provide compensation for any wetland impacts. A permit may also be required if the operation proposes to withdraw surface water in volumes large enough to require regulation.
- Groundwater Withdrawal permit may be needed if an operation is located in the Groundwater Management Area (basically east I95) and proposes to withdraw groundwater in sufficient quantity to be regulated.
- RCRA requirements (subtitle I) may apply for petroleum products stored in sufficient quantities in tanks above or below ground. Additionally, any hazardous or solid wastes, depending on the use or management of the materials may require regulation under subtitle C or D).
- Virginia Pollution Abatement (VPA) permits may be utilized to authorize pollutant management activities including, but not limited to, animal feeding operations, storage or land application of sewage, sludge, biosolids, industrial waste or other waste; or the complete reuse or recycle of wastewater. These permits do not authorize any point source discharge of pollutants to state waters.

DEQ regulatory requirements for any proposed mining operation are at least as stringent as federal requirements and would include the applicability of any additional state environmental program requirements.

<u>The Virginia Department of Health (VDH)</u>

Waterworks

VDH's Office of Drinking Water (ODW) implements the federal Safe Drinking Water Act (SDWA), 42 U.S.C. Section 300f et. seq, through the Virginia Waterworks Regulations (12VAC5-590). ODW provides regulatory oversight for public water systems (waterworks), which are defined as serving water to at least 25 persons 60 days out of the year. When this threshold determination is met, there are sampling, monitoring, and reporting requirements for certain drinking water contaminants.

The State Health Commissioner has authority to issue an emergency order to protect public health from imminent dangers. In most cases, emergency responses are left up to the waterworks owners and operators most familiar with the waterworks' design and operation, condition of infrastructure, system capabilities, and governing resources. ODW typically provides a supporting role by providing technical assistance, information to various entities and waterworks, and other compliance assistance as needed. Most incidents involve water main breaks, equipment failures, pressure loss, or boil water notices.

Private Wells, Springs, and Cisterns

Private water supplies serve a single user or occasionally a small group of users that do not qualify as a waterworks, and can be for either potable or non-potable uses. Private water supplies include residential water wells, agricultural wells, industrial wells, and geothermal wells. Developed springs and cisterns are also private water supplies but are not used as frequently in the Commonwealth.

The Office of Environmental Health Services (OEHS) and local health departments regulate private water wells under the provision of the Private Well Regulations (12 VAC 5-630-10 et seq.). Prior to 1982 there were no regulations for construction or location of private wells. From 1982 to 1990 VDH regulated the construction and location of private wells when installed in conjunction with an onsite sewage system. In 1990, the Board of Health promulgated the Private Well Regulations in response to amendments to 32.1-176.2 and 32.1-176.4 of the Code of Virginia. These regulations set minimum construction standards and horizontal setbacks from potential sources of contamination for all private water wells. Additionally, they require bacteriological testing of the water at the time of initial construction or rework for all private residential drinking water wells (Class III wells). Revisions adopted in 2012 include minimum storage capacity and yield requirements for residential drinking water wells.
VDH estimates there to be more than 700,000 private wells in the Commonwealth. VDH does not have a reliable inventory of all private water supplies because the construction of many private water wells predated the Board of Health's regulatory program.

The Private Well Regulations do not address the chemical or radiological quality of the water from private water wells or mandate periodic on-going testing of the water from private wells. The only water quality standard for private water wells in Virginia is the requirement that private drinking water wells are free of bacteriological contamination at the time they are approved for use. Bacteriological requirements do not apply to non-potable private wells such as agricultural wells. VDH does not have the authority to implement additional water quality standards for private water supplies.

Developed springs and cisterns should only be considered when no other source of potable water is feasible. The VDH Sewage Handling and Disposal Regulations provide minimum separation distances between onsite sewage disposal systems and developed springs or cisterns. Minimum construction standards are meant to mitigate the risk of pollution in developed springs and cisterns.

NOTE: The draft displayed below is a living document that will likely undergo several revisions before it is publicly released on December 1, 2022.

However, VDH does not have the authority to implement water quality standards, including bacteriological contamination, for developed springs and cisterns.

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Detailing local land use/zoning procedures/requirements (special or conditional use permits)

Virginia is known as a Dillon's Rule state. The Virginia Supreme Court has held that Dillon's Rule "provides that municipal corporations possess and can exercise only those powers expressly granted by the General Assembly, those necessarily or fairly implied therefrom, and those that are essential and indispensable.[57] Counties are authorized to adopt such measures as it deems expedient to secure and promote the health, safety and general welfare of its inhabitants which are not inconsistent with the general laws of the Commonwealth.[58]

Traditionally, zoning authority has been left to localities in the Commonwealth. Localities typically utilize this authority by enacting zoning ordinances. In its declaration of legislative intent regarding zoning ordinances, the General Assembly "….intended to encourage localities to improve the public health, safety, convenience, and welfare of their citizens and to plan for the future development of communities to the end…..that the need for mineral resources and the needs of agriculture, industry and business be recognized in future growth."[59] The General Assembly further established that zoning ordinances "…shall be for the general purpose of promoting the health, safety or general welfare of the public…"[60]

With respect to mining, the General Assembly granted the localities the ability to "…regulate, restrict, permit, prohibit, and determine…..[t]he excavation or mining of soil or other natural resources."[61]

Mining is generally considered an industrial use in most localities. Localities can grant special use permits in order to enforce things like noise, traffic, and highway entrances. Some localities enforce these conditions through a conditional use permit.

All of these local approvals are separate and distinct from permits which may be required from state agencies. In a mining context, prospective operators typically pursue available local approvals before seeking state permits, though no requirements exist directing the order in which these approvals are sought.

[57] See *City of Richmond v. Confrere Club,* 387 SE 2d 471, (1980).
[58] See § 15.2-1200 of the Code of Virginia.
[59] See § 15.2-2200 of the Code of Virginia.
[60] See § 15.2-2283 of the Code of Virginia.
[61] See § 15.2-2280 of the Code of Virginia.