Office of the
Auditor General
of British Columbia

June 2022

Oversight of Major Mines: Policies and Procedures to Address Environmental Risks

An independent audit report

Office of the
Auditor General
of British Columbia

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The Honourable Raj Chouhan
Speaker of the Legislative Assembly
Province of British Columbia
Parliament Buildings
Victoria, British Columbia
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Dear Mr. Speaker:

I have the honour to transmit to the Speaker of the Legislative Assembly of British Columbia the report: *Oversight of Major Mines: Policies and Procedures to Address Environmental Risks*.

We conducted this audit under the authority of section 11(8) of the *Auditor General Act*. All work in this audit was performed to a reasonable level of assurance in accordance with the Canadian Standard on Assurance Engagements (CSAE) 3001—Direct Engagements, set out by the Chartered Professional Accountants of Canada (CPA Canada) in the *CPA Canada Handbook—Assurance*.

Michael A. Pickup, FCPA, FCA
Auditor General of British Columbia
Victoria, B.C.

June 2022

Contents

The Office of the Auditor General of British Columbia acknowledges with respect that we conduct our work on Coast Salish territories, primarily on the traditional lands of the Lekwungen-speaking people (Esquimalt and Songhees Nations) and the W̱SÁNEĆ people (Pauquachin, Tsartlip, Tsawout, Tseycum First Nations).

Audit at a glance

Why we did this audit

- Mining is an important source of jobs, government revenues, and regional development in B.C. It also presents significant environmental and public safety risks if not well managed.
- Abandoned mines also pose a risk to public safety and the environment if not properly managed.
- In 2016, an audit completed by our office concluded that the Ministry of Energy, Mines, and Low Carbon Innovation's compliance and enforcement activities were inadequate to protect the province from significant environmental risks associated with major mines.
- In response to our audit, the ministry made changes, including: amending the *Mines Act*, forming new policies and procedures, and establishing the Abandoned Mines Branch, Mines Investigations Unit, and Mine Audits Unit.
- We wanted to see if these changes addressed key risks identified in 2016.

Objective

To determine if the ministry developed:

1. Adequate policies and procedures to address the key environmental risks of major mines identified in the 2016 audit of compliance and enforcement of the mining sector.
2. An adequate framework to manage the potential public safety and environmental risks of abandoned mines.

Audit period:

June 1, 2020, to April 30, 2022

Conclusion

We concluded that the ministry:

1. Developed adequate policies and procedures to address the key environmental risks of major mines identified in the 2016 audit of compliance and enforcement of the mining sector, with minor exceptions.
2. Developed an adequate framework to manage potential public safety and environmental concerns at abandoned mines, with one exception.

We made five recommendations focused on compliance and enforcement policies, historical permits, reclamation liabilities, and abandoned mines.

The ministry has accepted all five recommendations.

What we found

1. Policies and procedures – major mines

Compliance and enforcement activities

- A plan was developed outlining the ministry's regulatory approach to compliance and enforcement.
- Risk-based inspection planning was established.
- Processes to monitor mines for compliance with reporting requirements were inconsistent.
- Policies and procedures for inspections were developed, but not all were formally documented.
- The Mines Investigations Unit was established to investigate serious incidents, including environmental damage incidents.
- Tools for addressing non-compliance with requirements were developed.

Recommendations 1 and 2

Reclamation security

- A reclamation security policy was developed.
- Work to decrease the difference between liabilities and security was in progress. As of March 31, 2021, the difference was approximately $1.14 billion.

Recommendation 3

Evaluation and continual improvement

- The Mine Audits Unit was established to evaluate the effectiveness of the ministry's regulatory framework for mining.
- A process to implement recommendations from the chief auditor was established.

Enforceable language in permits

- Policies and procedures to write permits with enforceable language were developed.
- A process for updating historical permits with enforceable language was developed, with 25 of 94 permits updated.

Recommendation 4

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2. Abandoned mines

Abandoned mines framework

- The Abandoned Mines Branch was established to manage public safety and environmental risks at abandoned mine sites.
- A risk-based approach to address public safety concerns at abandoned mines was developed.
- No risk-based approach to address environmental concerns at abandoned mines was in place.

Recommendation 5

After reading the report, you may want to ask the following questions of government:

1. What is the ministry's timeline for ensuring all major mines are adequately bonded to minimize taxpayer liability?
2. How will the ministry ensure that it consistently monitors the large volume of compliance reports it receives from mine operators?
3. How will the ministry ensure the work to assess public safety and environmental risks at all abandoned mines in B.C. is completed?

Background

Mineral exploration, mining, and related sectors in B.C. employ more than 30,000 people. Total mineral production in 2020 was worth $7.3 billion.

Operating Major Mines in B.C.

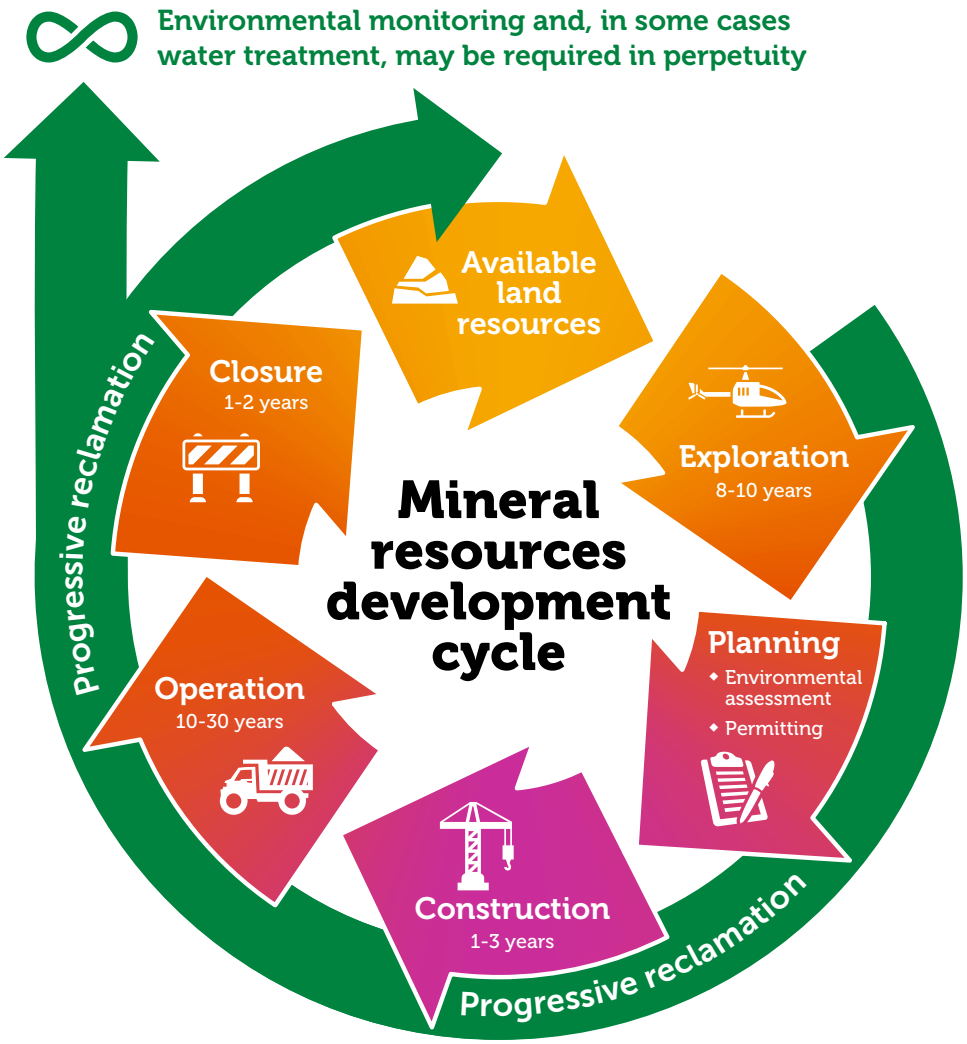
There are two types of mines: major and regional.

Major mines typically produce metal and coal, but very large aggregate or industrial minerals operations may also qualify as major mines. Major mines require authorization from multiple federal and provincial agencies. In B.C., there are 113 major mines, with 21 in operation.

Regional mines (mineral and coal exploration, rock quarries, sand and gravel pit, quarry, or placer) are generally smaller and typically include mining activities related to rock, industrial minerals, limestone, earth, clay, sand, gravel, or placer minerals from stream bed deposits.

There are also 90 abandoned mines, defined as major mines for which all permit obligations under the *Mines Act* have been satisfied and the permit has been relinquished. These mines may require additional clean-up or have public safety risks.

Under the *Ministry of Energy and Mines Act*, the Ministry of Energy, Mines and Low Carbon Innovation is responsible for regulating all mining activity as defined in the *Mines Act*. The *Mines Act* applies to all mines during exploration, development, construction, production, closure, reclamation, and abandonment phases.



The ministry's regulatory oversight includes granting approval of mining activities through permits, and compliance verification and enforcement activities. The ministry sets permit conditions to address environmental risks and it verifies compliance with environmental requirements. The ministry's authority under the *Mines Act* generally applies within mine site boundaries, as defined in the permits it issues under the act.

The ministry's regulatory oversight relating to environmental aspects of mines occurs within three technical disciplines:

- **Geotechnical engineering** focuses on the design, operation, and maintenance of engineered site infrastructure, including waste rock dumps, stockpiles, open pits, and underground mine development.
- **Geoscience** focuses on the metal leaching and acid rock drainage potential of mine waste, mine waste management, water management, water quantity and quality predictions, source control measures, and water treatment and other mitigation measures for mines in B.C.
- **Reclamation** focuses on reclamation and closure plans for mines in B.C. It also focuses on the management and mitigation of sediment and erosion, dust, vegetation, wildlife, and cultural heritage protection.

For their respective areas, each discipline is responsible for their respective aspects of *Mines Act* application technical reviews, compliance and enforcement activities, incident response, and policy development.

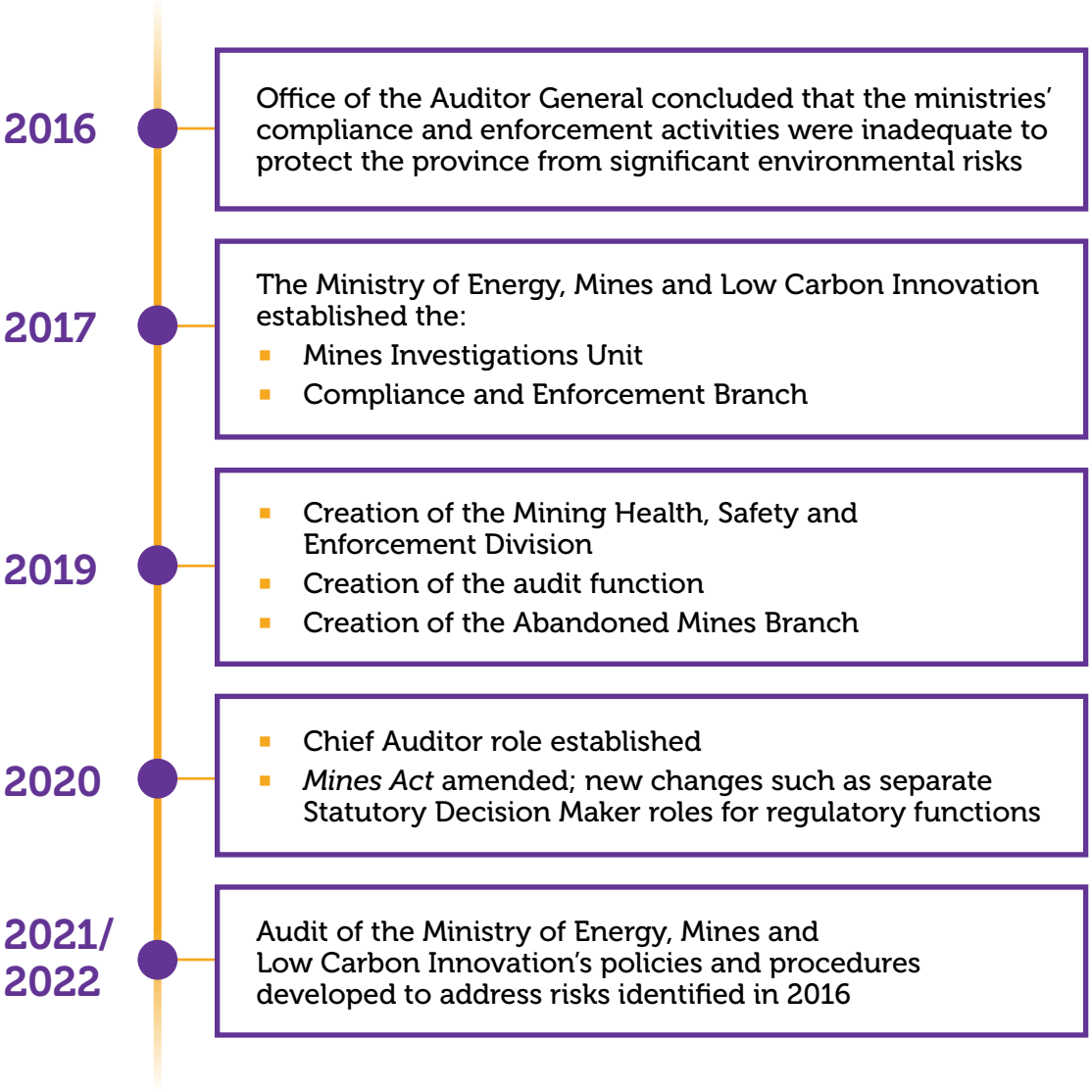
In 2016, the Office of the Auditor General conducted an audit on mining compliance and enforcement in two ministries: the Ministry of Energy and Mines and the Ministry of Environment (now known as the Ministry of Energy, Mines and Low Carbon Innovation and the Ministry of Environment and Climate Change Strategy respectively). The audit examined compliance and enforcement planning, permitting, promotion, verification, enforcement, evaluation, and reporting for major mines. The audit concluded that the compliance and enforcement activities of the two ministries were inadequate to protect the province from significant environmental risks. The audit made one overall recommendation and 16 sub-recommendations to both ministries.

> "The Ministry of Energy, Mines, and Low Carbon Innovation, the Ministry of Environment and Climate Change Strategy, the Environmental Assessment Office, and other agencies provide compliance oversight of mining activities. The agencies coordinate inspection priorities, share information about compliance concerns, share training opportunities, conduct joint inspections and 'observe, record, report' for one another."
>
> BC Mine Information website

Since the 2016 audit, both ministries have implemented changes to address the recommendations. However, this audit focused solely on one ministry, the Ministry of Energy, Mines and Low Carbon Innovation. The ministry has undergone organizational changes to address the recommendations, including the separation of permitting and compliance and enforcement functions. The *Mines Act* was amended in 2020 to include the added position of chief permitting officer to oversee permitting activities, separate from the chief inspector who oversees compliance activities. It also created the position of chief auditor.

During the current audit period, the ministry was transferring environmental compliance activities for major mines from the Major Mines Office to the Office of the Chief Inspector of Mines. The chief inspector's office is projected to assume all environmental compliance activities in fiscal year 2022/23.

Timeline of events since the 2016 audit



Objective

The objective of the audit was to determine whether the Ministry of Energy, Mines and Low Carbon Innovation:

1. Developed adequate policies and procedures to address the key environmental risks of major mines identified in the 2016 audit of compliance and enforcement of the mining sector.
2. Developed an adequate framework to manage potential public safety and environmental risks of abandoned mines.

Scope

This audit examined the Ministry of Energy, Mines and Low Carbon Innovation's key policies and procedures to address the environmental risks of major mines identified in the 2016 audit. This examination included:

- Compliance and enforcement policies, procedures, and tools.
- Reclamation security policy.
- Continual improvement processes.
- Public reporting.

The audit also examined the ministry's oversight of abandoned mines, including its framework for addressing public safety and environmental risks at abandoned mines and related reporting.

We did not audit the effectiveness of the ministry's policies and procedures to address environmental risks.

Audit period: June 1, 2020, to April 30, 2022.

Learn more about the audit criteria on page 37.

Learn more about how we did this audit on page 33.

Conclusion

Audit Conclusion 1

The Ministry of Energy, Mines and Low Carbon Innovation developed adequate policies and procedures to address the key environmental risks of major mines identified in the 2016 audit of compliance and enforcement of the mining sector, with minor exceptions.

Specifically, the ministry had:

- Developed processes to ensure permits are written with enforceable language.
- Enhanced its compliance and enforcement policies and procedures.
- Created a process for consistently responding to serious incidents.
- Implemented an internal audit unit to evaluate the effectiveness of the ministry's mining regulation.
- Introduced a reclamation security policy for major mines, including a plan to reduce the difference between reclamation liabilities and securities held.

The ministry had not developed written procedures for geotechnical inspections or a consistent approach to reviewing reports submitted by mines throughout the year as part of compliance monitoring activities.

Audit Conclusion 2

The Ministry of Energy, Mines and Low Carbon Innovation developed an adequate framework to manage potential public safety and environmental concerns at abandoned mines, with one exception.

In 2019, the ministry created the Abandoned Mines Branch to mitigate risks to public safety and address environmental risks at abandoned mines. The ministry also developed a risk-based approach to address public safety concerns at abandoned mines but had not yet developed a risk-based approach for addressing environmental concerns.

Findings and recommendations

Compliance and enforcement

The ministry's regulatory oversight includes compliance verification activities (e.g., compliance reviews and inspections) and enforcement activities (e.g., issuing orders and administering penalties). All mining activities in B.C. are regulated under the *Mines Act*, the *Health, Safety and Reclamation Code*, and the conditions of any permit issued for the mining activities, collectively known as regulatory requirements. Effective compliance and enforcement activities are key components of meeting the ministry's goal of continually improving oversight to protect the environment.

The 2016 audit of compliance and enforcement in the mining sector found significant issues with the ministry's compliance and enforcement program, including:

- Lack of a plan outlining its regulatory approach to compliance and enforcement.
- No risk-based approach to inspection planning.
- No established policies or procedures for reviewing reports that are submitted by industry.
- Inadequate capacity and expertise to effectively use available enforcement tools.

Compliance and enforcement plan developed

What we looked for

We assessed whether the ministry developed a plan detailing its regulatory approach to compliance (e.g., monitoring, inspections, and audits) and enforcement (e.g., issuing orders, administering penalties).

The ministry's Mines Health and Safety Enforcement Division is responsible for conducting compliance verification and enforcement activities and improving overall industry safety and regulatory effectiveness. We expected that the division would have a plan to achieve its mandate for environmental compliance and enforcement, including key priorities, activities, timelines, and deliverables.

Learn more about the audit criteria on page 37.

What we found

The ministry had a 2020/21 business plan that outlined its regulatory approach to compliance and enforcement. After restructuring in 2021, the ministry developed 2021/22 business plans for the Office of the Chief Inspector of Mines and the Regulatory Management and Enforcement Branch. Both plans included a vision, values, and priorities, and outlined each branch's approach to compliance and enforcement activities.

We also found that the ministry reported annually on compliance activities through Annual Chief Inspector Reports, a requirement under section 36 of the *Mines Act*.

Why this matters

Planning is a key component of any entity's operations. It helps to identify what an organization wants to achieve, how it will achieve it, and when it will achieve it. Having plans in place supports the ministry's ability to achieve its mandate regarding oversight of mining activities.

Risk-based inspection planning developed

What we looked for

We assessed whether the ministry developed a risk-based approach to inspection planning for each of its environmental disciplines: geotechnical, geoscience, and reclamation. We looked for inspection planning that included risk criteria and ranking, and application to all major mines during production and closure phases.

Learn more about the audit criteria on page 37.

What we found

The ministry had a risk-based inspection planning tool for each of its environmental disciplines. We found that the ministry formalized its risk-based approach to inspection planning in 2021 with the development and introduction of a risk-based planning tool. There was a risk-based planning tool for general inspections, as well as one for each of the environmental disciplines. Each discipline ranked and prioritized mines for inspection based on their respective ranking criteria. We found that inspection selection was comprehensive and all three environmental disciplines included both open and closed mines as part of the risk-ranking process.

Why this matters

Having a comprehensive risk-based approach to inspection planning is important for the ministry's compliance and enforcement activities as it supports the prioritization of inspections when resources are not sufficient to inspect all mine sites every year. A primary consideration in establishing compliance priorities is risk (actual or potential impact to the environment, human health, safety or Crown resources and revenue) and the likelihood of such an occurrence.

Inconsistent processes for monitoring reporting requirements

What we looked for

We assessed whether the ministry had developed a process for consistently monitoring all major mines for compliance with geotechnical, geoscience, and reclamation reporting requirements.

Under the *Health, Safety and Reclamation Code* and mine-specific permit conditions, mines were required to submit several types of reports at different times throughout the year to comply with environmental reporting requirements (geotechnical, geoscience and reclamation). We expected that, given the volume of reports that are submitted, the ministry would have an approach to monitoring these reports, including tracking submissions, prioritizing reports for review, reviewing reports, and following up when reports were not submitted as required.

Learn more about the audit criteria on page 37.

What we found

We found that the ministry had not implemented a process to consistently monitor all major mines for compliance with environmental reporting requirements across the three environmental disciplines. The geoscience discipline had a consistent process in place for monitoring reports, while the reclamation and geotechnical disciplines had processes for monitoring some code-required reports and no process for permit-required reports.

The geoscience discipline had a process in place

The geoscience discipline had a consistent process in place to track and monitor required reports. These reports were all permit-required reports and were submitted by mines at different times throughout the year depending on permit requirements. The geoscience discipline did not have any code-required reporting. The geoscience process included reviewing a report log provided by the records technician, prioritizing reports for review based on five criteria, and assigning staff to review the reports. This information was kept in the geoscience discipline's permit-required reports tracking table.

The reclamation discipline monitored some reports

The reclamation discipline developed a process for tracking the submission of two code-required reports for reclamation, an Annual Reclamation Report and a Five-Year Mine Plan and Reclamation Program Report. Annual Reclamation Reports were reviewed only during the inspection process, while Five-Year Mine Plans were reviewed when submitted every five years.

There was no process for tracking permit-required reports. Ministry staff indicated that permit-required reports could be reviewed when planning for inspections, when a permit amendment was sought, or if there was a need to examine the mine-specific file. While the ministry was notified when reports were submitted, there was no established process for the reclamation team to be notified that a permit-required report was submitted or when a mine had failed to submit a permit-required report.

The geotechnical discipline monitored some reports

The geotechnical discipline had a process to monitor three code-required reports (Dam Safety Inspections, Dam Safety Reviews, and Independent Tailings Review Board reports). However, there was no process for monitoring other code-required geotechnical reports such as Care & Maintenance Manuals and Water Management Plans.

The geotechnical discipline did not have a process for monitoring permit-required reports. While the ministry was notified when these reports were submitted, there was no established process for the geotechnical team to be notified when a mine had failed to submit a permit-required report.

Why this matters

An inconsistent approach to monitoring mines for compliance with reporting requirements outside of the inspection process can result in areas of environmental risk not being addressed until a mine is inspected for compliance with geotechnical, geoscience, and reclamation requirements.

Recommendation

1. We recommend the ministry ensure all environmental disciplines have a process for consistently monitoring major mines for compliance with reporting requirements.

See the response from the auditee on page 34.

Policies and procedures for inspections developed

What we looked for

We assessed whether the ministry had developed policies and procedures for inspections of major mines to verify compliance with each of its environmental disciplines: geotechnical, geoscience, and reclamation. We specifically looked at whether policies and guidance had been developed to support inspectors in their compliance verification activities with their respective discipline's requirements.

Learn more about the audit criteria on page 37.

What we found

The ministry developed policies and procedures for inspections of major mines including:

- A compliance and enforcement policy.
- A high-level inspection procedure document.
- A compliance workplan with priorities and areas of focus for inspections.
- Informal inspection procedures (e.g., training, peer review) used by each discipline.

We also found that the ministry had discipline-specific guidance for two of the three environmental disciplines: geoscience and reclamation. The geotechnical discipline did not have discipline-specific written guidance but had processes in place for conducting inspections.

Why this matters

Inspection policies and procedures enhance compliance and enforcement consistency by providing guidance to inspectors on how to do their work. Not having these policies and procedures in writing puts the ministry at risk of being unable to ensure consistency and continuity, especially for technical disciplines that require significant professional judgment.

Recommendation

2. We recommend the ministry formalize geotechnical inspection procedures to support consistency of inspections.

See the response from the auditee on page 34.

Mines Investigations Unit established

What we looked for

We assessed whether the ministry had policies and procedures to consistently respond to serious incidents. Section seven of the *Mines Act* gives the ministry authority to investigate incidents that have caused (or have/had the potential to cause) serious personal injury, loss of life or property, or environmental damage.

Learn more about the audit criteria on page 37.

What we found

The ministry had a policy, a manual, and procedures to consistently respond to serious incidents. In 2017, the ministry created the Mines Investigations Unit. The unit is responsible for carrying out investigations of fatalities, serious injury incidents, major environmental incidents, and major or chronic non-compliance with the *Mines Act* and the *Health, Safety and Reclamation Code*.

We found that the unit had the following policies and procedures in place:

- The *Investigations Under the Mines Act and Regulation Policy* provided clarification and direction for initiating investigations, conducting investigations, reporting investigation findings and recommendations, and file closure.
- An investigation procedure based on a major case management process to support consistent approaches to serious incidents.
- A manual for conducting investigations, the *Mines Investigations Unit Investigations Business Rules: Procedure Manual*.

Why this matters

Investigations are a key tool for identifying the cause of a serious incident, including contributing factors, so that similar incidents can be prevented in the future. Without policies and procedures for consistently conducting investigations, the ministry would not be able to conduct investigations in a complete and thorough manner.

Tools for addressing non-compliance developed

What we looked for

We examined whether the ministry developed tools for addressing non-compliance with environmental regulatory requirements. Tools are defined as any policies, procedures, mechanisms, or steps taken to support the ministry's enforcement requirements.

Learn more about the audit criteria on page 37.

What we found

Under the *Mines Act*, the ministry has authority to address non-compliance through orders, administrative monetary penalties, administrative sanctions, and prosecution. The ministry developed tools to address non-compliance, including:

- A non-compliance decision matrix for staff to use when considering the appropriate enforcement tool to apply to individual cases of non-compliance.
- Training and guidance for staff, including training on writing enforceable orders.
- The creation the Mines Investigations Unit to support the ministry's ability to issue administrative monetary penalties and use prosecutions as an enforcement tool.
- Use of the Regulatory Management and Enforcement Branch to assist inspectors by reviewing issues of non-compliance and providing support for escalating enforcement actions.

Why this matters

Enforcement is the backbone of any compliance program. Encouraging compliance through strategies involving education and assistance, monitoring and inspections, and incentives is only effective if backed by credible enforcement actions. The necessary tools to address non-compliance can support and empower ministry staff to enforce environmental requirements as needed.

Reclamation security and liability

As a condition of *Mines Act* permits, mine operators must provide financial security in an amount and in a form acceptable to the chief permitting officer of mines.

Financial securities are held until the chief inspector is satisfied reclamation obligations have been fulfilled. The amount of security is site specific and reflects outstanding reclamation and closure obligations associated with the site. This security is only returned once the mine site has been reclaimed to a satisfactory level and there are no ongoing monitoring or maintenance requirements.

The intent of reclamation security is to ensure modern mine sites in B.C. do not leave ongoing environmental impacts or require public funds for clean-up activities.

The 2016 audit found that the ministry could not provide evidence that the amount of security held by the province was adequate. The ministry was carrying less than half of the estimated liability. It was unclear whether that met government's risk tolerance as there was no clearly articulated reclamation securities mandate for the province.

Reclamation security policy developed

What we looked for

Currently, all new mines are required to post 100 per cent of their reclamation liability amount, while some older mines are not required to post the full amount, resulting in a difference between the liability and security held by the ministry. We looked at whether the ministry had developed a reclamation security policy that articulated its liability risk tolerance for major mines (i.e., its approach to fully or not fully bonding mines based on their risk levels).

Learn more about the audit criteria on page 37.

What we found

The ministry developed a reclamation security policy that articulated its liability risk tolerance for major mines. In 2016 and 2017, the ministry had consultants Stantec and Ernst & Young provide research for the policy. The ministry also met with various partners and organizations for their feedback.

The ministry's reclamation security policy identified new mines with less than five years in operation as the highest risk and that therefore needed to be fully bonded, while long life mines were lower risk and could be eligible for an exploration incentive security. The policy also outlined that security payments must be scheduled to keep pace with land disturbances throughout the life of the mine and must be reviewed every five years, and that the bond held would increase incrementally with the level of disturbance.

Further, the policy encouraged mine operators to progressively reclaim sites to reduce the value of the bond they are required to hold.

Last, the policy required a default contingency amount of 15 per cent of the liability estimate, with the potential that larger values may be required depending on the level of uncertainty, while smaller values would need to be justified.

Why this matters

Under the *Mines Act*, the ministry is empowered to require that mines provide a financial security deposit that is held by government. This deposit is designed to ensure that taxpayers will not have to contribute to mine reclamation costs if a company defaults on its environmental obligations. A policy articulating the ministry's appetite for risk helps to define appropriate security levels needed to achieve ministry objectives.

Gap between liabilities and securities reduced

What we looked for

As of March 31, 2021, the ministry held a total of $2.31 billion in reclamation securities for major mines, while the total liabilities for major mines were estimated at $3.45 billion, leaving a difference of $1.14 billion (this is an industry estimate that the office did not audit). We looked to see whether the ministry created a plan to reduce that difference.

We also looked to see whether the ministry reported annually on the estimated liability and actual security held for each major mine in B.C.

Learn more about the audit criteria on page 37.

What we found

The ministry followed a process for reducing the difference between province-wide reclamation liabilities and securities for major mines. Specifically, the ministry took an opportunistic approach by updating security amounts when permit amendments were submitted. The ministry also reviewed Annual Reclamation Reports and Five-year Mine Plans to assess whether security amounts needed to be increased. In one case, the ministry took a proactive approach to ensure that a high-risk mine had sufficient security to cover most of its liability.

Liability Estimates

An updated, detailed reclamation and closure liability cost estimate must be submitted to the ministry at least every five years (typically with the submission of the Five-year Mine Plan) and when there are significant proposed changes to the mine plan or reclamation programs. An annual liability cost estimate, which shows the details of the mine's current reclamation and closure liabilities, must be submitted with the Annual Reclamation Report, due March 31 every year.

The ministry's reclamation security policy seeks to reduce the difference between reclamation liabilities and reclamation securities for existing mines. For example, mines with depleted reserves that pose a greater risk of default must be fully bonded to protect the environment and taxpayers. Further, according to the policy, the ministry aims to reduce the difference over the next five years. The ministry was developing a cost calculator for reclamation security for major mines, along with a roadmap to assess reclamation liabilities.

The ministry publicly reported the estimated liability and security held for major mines in the Annual Chief Inspector of Mines Reports. The *2020/21 Annual Chief Inspector Report* showed an increase in major mines securities held from 2016/17 to 2020/21 of $1.05 billion, and a reduction of more than $430 million in the difference between liabilities and securities over the same period.

Why this matters

The consequence of not collecting enough security from mining companies is that taxpayers may be left to cover the difference if reclamation costs exceed the mining company's ability to pay.

Recommendation

3. We recommend the ministry continue its work to narrow the difference between reclamation liabilities and securities held, including reporting on its progress to reduce the difference.

See the response from the auditee on page 35.

Photo: Province of British Columbia

Enforceable language in permits

The ministry is responsible for issuing permits under the *Mines Act* and establishing site-specific permit conditions. Proposed major mines, expansions or upgrades to existing mines, and some large-scale projects require a permit before starting any work. Ministry inspectors enforce conditions outlined in permits. It is therefore important that permits use enforceable language.

The 2016 audit found examples of vague phrasing and inconsistent use of regulatory language that would make permit requirements difficult to implement, measure, and enforce. There was no guidance for permit writing, including environmental protection requirements. The report also found that the ministry did not regularly evaluate or review permits to identify areas that might create barriers to enforcement.

Policies to write permits with enforceable language developed

What we looked for

We looked at whether the ministry had policies and procedures to write permits with enforceable language.

Learn more about the audit criteria on page 37.

What we found

The ministry had policies and procedures in place to write permits with enforceable language. A SMART (specific, measurable, achievable, relevant and time-bound) conditions policy was developed that outlined five principles with examples to help inspectors ensure language was enforceable. The policy also stated that supervisory review was mandatory for all permits for major mines.

Templates were created for writing permits, and technical managers and statutory decision makers were required to review draft permits.

Why this matters

Approval for mining activities is provided through permits. Permits outline regulatory requirements that a mine operator must follow over the life of the mine, thereby playing a crucial role in preventing and reducing environmental risks. It is important that permits are written using language that allows permit conditions to be consistently interpreted to ensure compliance. Having guidance that ensures permits are written with enforceable language supports the ministry's ability to effectively enforce permit conditions.

Process for updating historical permits with enforceable language developed

What we looked for

We looked at whether the ministry had a plan to update historical permits that may not have enforceable language. We assessed whether government had identified major mines with historical permits and had a plan for updating them.

Learn more about the audit criteria on page 37.

What we found

The ministry did not have a proactive plan but did follow a process to identify mines with historical permits and updated them with enforceable language when possible. We found that the ministry had identified and tracked major mines that may have older, unenforceable permit conditions, and it had engaged in a formal process to update the permits of 25 major mines out of 94 mine permits that require updates. Ministry staff told us that if an amendment to an existing permit was requested, staff used the opportunity to amalgamate the permit to ensure it had enforceable language. We also found that all new mine permits were drafted using a template to ensure they were written with enforceable language.

Why this matters

Permits generally set out site-specific operating conditions. However, *Mines Act* provisions, regulations, and the *Health, Safety and Reclamation Code* remain applicable and can be enforced as required, even when a permit is outdated. It is important that all major mine permits include language that allows the ministry to enforce current environmental regulations and act as an effective regulator for the protection of the environment. Systematic reviews of older permits are also important to identify areas that may create barriers to enforcement.

Recommendation

4. We recommend the ministry continue its work to update historical permits with enforceable language.

See the response from the auditee on page 35.

Evaluation and continual improvement

Compliance and enforcement programs should be evaluated at regular intervals to ensure that the program activities result in the reduction of non-compliant activities. Evaluations can result in greater awareness of problems and are important ways to strategically plan for more effective oversight activities.

The 2016 audit found that the ministry did not have a formal process to evaluate the effectiveness of its compliance and enforcement activities. As a result, the ministry did not know whether its compliance and enforcement policy decisions were effective, and was unable to report to the government or the public on the effectiveness or impact of its activities.

Mine Audits Unit established

What we looked for

We assessed whether the ministry had developed a process for continually improving and reporting the effectiveness of its environmental compliance and enforcement activities.

Learn more about the audit criteria on page 37.

What we found

The ministry established a process for evaluating compliance and enforcement activities by creating the Mine Audits Unit in 2019. The *Mines Act* was amended in 2020 to create the position of chief auditor, appointed by the minister under the *Public Service Act*.

The chief auditor leads and oversees the work of the unit in its mandate to evaluate the effectiveness of provincial mining regulations in protecting the public, workers, and the environment.

The unit created an audit plan for 2019/20 and for 2021/22, as required under the *Mines Act* amendments. During our audit period, the chief auditor published two audits. One dealt with code requirements for tailings storage facilities in June 2021. The other concerned worker protection in mobile equipment near water in April 2022.

The unit also developed a reference manual with standards and procedures for audit topic selection, planning, conducting, and reporting. The unit was finalizing its processes for quality assurance.

Why this matters

A process for evaluating effectiveness supports the ministry as it determines whether its environmental compliance and enforcement activities are effective and aligned with government's goals, and whether improvements are necessary. This process also supports the ability to report to government and the public on the effectiveness or impact of its activities.

Process developed to support implementation of audit recommendations

What we looked for

The chief auditor has authority to develop an audit plan, carry out audits, produce reports with conclusions, and make recommendations if necessary. We assessed whether the ministry had developed a process or plan to support the implementation of recommendations made by the chief auditor and the unit. This included any tracking, analyzing, supporting, and verifying the work the ministry has done to implement the recommendations.

Learn more about the audit criteria on page 37.

What we found

We found that the ministry developed processes for requesting information and following up on actions taken to implement the recommendations. For example, a memorandum of understanding between the chief auditor and the ministry established mutual commitments in relation to audits. The memorandum of understanding included a commitment by the ministry to provide the chief auditor with annual written updates on any actions taken to address previous audit recommendations until those recommendations have been implemented.

The ministry developed a program charter for the Mine Audits Unit which committed the chief auditor to periodically publish the ministry's progress on recommendations until implementation. The unit also had a reference manual that stated the unit may verify and assess the ministry's progress in relation to previous audit recommendations through follow-up audits, and the decision to do so would be made through the audit unit's annual planning process.

The ministry responded to both internal audits by accepting all recommendations and developing action plans to address them. The action plans list all recommendations, the actions the ministry has committed to doing, along with target dates for initiation and implementation. We also found there was a Strategy and Advisory Services team (within the Mine Audits and Strategic Services Branch) with responsibility for tracking and requesting the updates and preparing a quarterly report on actions taken by the ministry to address audit recommendations.

Why this matters

Processes to implement recommendations provided by the Mine Audits Unit are an important part of continual improvement. These processes support the ministry in meeting its own objective to continually improve oversight of the mining industry, which in turn reduces environmental risks.

Abandoned mines

Mining has occurred in B.C. for more than 100 years, but reclamation legislation did not come into effect until 1969. Since permitting of mine activities started in 1969, a number of major mines have operated and closed with the reclamation obligations being fulfilled to the standards of the day. Mines that met reclamation obligations and had their permits closed are referred to as abandoned mines. At some of these mines, reclamation does not meet today's standards, leaving environmental and/or public safety concerns.

This audit did not examine historic mines that operated and closed prior to the enactment of reclamation legislation in 1969 and were not permitted under the *Mines Act*. Historic mines are mostly managed under the Ministry of Forest's Crown Contaminated Sites Program.

There are 90 abandoned mines in the province that may require additional cleanup or need public safety hazards addressed. The 2016 audit found that the ministry's inspection planning had no specific focus or guidance for conducting inspections at abandoned mines.

Abandoned Mines Branch established

What we looked for

Under the *Mines Act*, the ministry has authority to take action at abandoned mines to prevent danger to people or property, or to decrease pollution of the land and watercourses affected by the mine. We examined whether the ministry had a detailed approach to assessing the risks of abandoned mines, including documents to show:

- Goals and objectives related to abandoned mines.
- Resourcing requirements to assess risks of abandoned mines.
- Timelines and performance indicators for meeting objectives.

Learn more about the audit criteria on page 37.

What we found

The ministry had developed a program to manage the potential public safety and environmental concerns at abandoned mines.

In September 2018, the ministry developed a concept paper proposing the abandoned mines program, which set out guiding principles for developing and implementing a systematic approach. The paper included a summary of resources needed by the program.

The ministry established the Abandoned Mines Branch in 2019 with a mandate to take on responsibility of abandoned mines. Its responsibilities also included abandoned tailings storage dams that were previously under the management of the chief inspector's regulatory branch.

The program objectives of the branch were to address physical hazards to public safety, and environmental risks or contamination at abandoned mines. Work planning for abandoned mines occurred annually. The branch consisted of four staff and was responsible for the overall management of abandoned mines. Ministry staff indicated that independent qualified professionals were contracted to conduct site assessments, develop recommendations, and complete reclamation work. Funding for abandoned mines came from two streams: confiscated security deposits or provincial funds. In 2021, the branch allocated $2.41 million to abandoned mines work.

Why this matters

There are 90 abandoned mine sites that were closed and were reclaimed to the standards of the day, potentially leaving environmental and/or public safety concerns. A plan to manage abandoned mines is a key component of the ministry's ability to effectively address potential public safety and environmental risks at these sites.

Risk assessment of abandoned mines started

What we looked for

The creation of the Abandoned Mines Branch established the structure within the ministry to address risks at abandoned mines more systematically. We assessed whether the ministry had identified all abandoned mines in the province and developed an approach to assess them for potential public safety and environmental risks.

Learn more about the audit criteria on page 37.

What we found

The ministry had established an inventory of abandoned mines in the province and was in the early stages of assessing and risk-ranking the sites. We found the ministry had an approach – and had started some work – to assess risks to public safety. The branch had completed preliminary assessments at 10 sites prioritized for their potential public safety risks. The ministry had also developed a digital site assessment form to geo-reference and standardize site assessments to ensure consistency for field assessments.

We found the ministry did not have a documented approach for assessing mines presenting the highest risk to the environment. The ministry indicated for the second year of assessments (2022), the branch would focus on metal mines with known or suspected tailings storage facilities as they may pose a higher risk for contamination. No documentation was available to review, as the program was in the planning phase.

The branch had also assumed management of five tailings storage facilities at four abandoned mine sites. The branch oversaw the monitoring of the sites, including contracting with independent qualified geotechnical engineers to inspect and advise the ministry on dam stability and performance at the sites.

Why this matters

Abandoned mines generally have limited or poor historical documentation with respect to their social, environmental, and local economic impacts and liabilities. Due to the large number of abandoned mines and potential liabilities, the ministry must take a risk-based approach to address sites posing the highest risk to public safety and the environment. Using a risk-based approach can support management decisions to ensure the sites that present the highest risks receive priority for resources and funding.

Recommendation

5. We recommend the ministry continue its work to address abandoned mines presenting the highest risk to public safety and the environment, including developing a risk-based approach to addressing environmental risks.

See the response from the auditee on page 36.

Work done to address risks at abandoned mines reported

What we looked for

Section 36 of the *Mines Act* states that the chief inspector must publish an annual report showing results during the previous year in achieving the purposes of the act. We assessed whether the ministry had publicly reported on any work done to assess environmental risks of abandoned mines.

What we found

The ministry reported on the work done in 2021 to address the public safety and environmental risks of abandoned mines.

The ministry began publishing information about the Abandoned Mines Branch and its work in the *2020/21 Annual Chief Inspector Report*. The report included sections on the branch's mandate and regulatory authority, its approach to addressing the risks of abandoned mines, its work with other ministries and partners, and highlights of work done in 2020/21.

Why this matters

By effectively communicating results of its abandoned mines management, the ministry was able to fulfil its program objectives, and improve public confidence in its oversight capabilities of the mining sector.

About the audit

We conducted this audit under the authority of section 11(8) of the *Auditor General Act* and in accordance with the Canadian Standard on Assurance Engagements (CSAE) 3001—Direct Engagements, set out by the Chartered Professional Accountants of Canada (CPA Canada) in the *CPA Canada Handbook—Assurance*. These standards require that we comply with ethical requirements and conduct the audit to independently express a conclusion against the objective of the audit.

A direct audit involves understanding the subject matter to identify areas of significance and risk, and to identify relevant controls. This understanding is used as the basis for designing and performing audit procedures to obtain evidence on which to base the audit conclusion.

The audit procedures we conducted include document analysis and enquiry. The documents we analyzed included the ministry's mining oversight data and reports, mine permits and inspection reports, policy, procedure and guidance documents, and agreements with other ministries. We interviewed ministry staff and carried out most interviews remotely due to COVID-19 restrictions.

We believe the audit evidence we have obtained is sufficient and appropriate to provide a basis for our conclusions.

Our office applies the Canadian Standard on Quality Control (CSQC 1), and we have complied with the independence and other requirements of the code of ethics issued by the Chartered Professional Accountants of British Columbia that are relevant to this audit.

Audit report date: June 2, 2022

Michael A. Pickup, FCPA, FCA
Auditor General of British Columbia
Victoria, B.C.

Appendix A: Recommendations and auditee response

Recommendation 1: We recommend the ministry ensure all environmental disciplines have a process for consistently monitoring major mines for compliance with reporting requirements.

Recommendation 1 Response: The ministry accepts this recommendation.

Consistent processes are already in place to monitor compliance with reporting requirements for major mines that are selected for risk-based inspections. Consistent processes are also in place for monitoring compliance with reporting requirements for geoscience and reporting for tailings storage facilities as per the Health, Safety and Reclamation Code for Mines in British Columbia.

The Ministry of Energy, Mines, and Low Carbon Innovation has drafted the Compliance Verification of Reports Policy which lays out a process to track compliance with reporting requirements for major mines and establishes a consistent, risk-based approach for review of reports. The process for consistently monitoring major mines for compliance with reporting requirements will be implemented in June 2022.

Recommendation 2: We recommend the ministry formalize geotechnical inspection procedures to support consistency of inspections.

Recommendation 2 Response: The ministry accepts this recommendation.

General inspection procedures that apply to all inspections are already in place and existing discipline-specific geotechnical inspection procedures will be formalized in writing.

To ensure a consistent approach for all environmental inspections, the Ministry of Energy, Mines, and Low Carbon Innovation has drafted the Technical Compliance Inspections Procedures Manual, with separate sections for geoscience, reclamation, and geotechnical inspection procedures. This manual provides a common approach to inspections applicable to all the environmental disciplines, and details discipline specific areas of inspection focus and provides guidelines and resources.

Recommendation 3: We recommend the ministry continue its work to narrow the difference between reclamation liabilities and securities held, including reporting on its progress to reduce the difference.

Recommendation 3 Response: The ministry accepts this recommendation.

Between 2016 and 2021, the amount of reclamation securities held by the Province for major mines increased by $1.05B while the differential between the Province's security held and the reclamation liability of mining companies decreased by $430M over the same period. The Ministry of Energy, Mines, and Low Carbon Innovation recently published an Interim Reclamation Security Policy and will continue to work to reduce the differential in accordance with this Policy. Reporting on progress will continue to be included in the annual report of the Chief Inspector of Mines and the Chief Permitting Officer.

Recommendation 4: We recommend the ministry continue its work to update historical permits with enforceable language.

Recommendation 4 Response: The ministry accepts this recommendation.

To date, historical permits have been modernized for 26 major mines. This process includes updates to permit conditions to ensure that they are written with enforceable language. All new permit amendments are written with enforceable language consistent with the SMART conditions policy. The Ministry of Energy, Mines, and Low Carbon Innovation will continue its work to update historical major mine permits with enforceable language.

Recommendation 5: We recommend the ministry continue its work to address abandoned mines presenting the highest risk to public safety and the environment, including developing a risk-based approach to addressing environmental risks.

Recommendation 5 Response: The ministry accepts this recommendation.

Mine closure is a process that takes time and resources to ensure chemical and physical stability, and to implement approaches to minimize long-term active management. The ministry is assessing abandoned mines for both environmental and physical liabilities to focus on addressing those sites that are highest risk to public safety and the environment. The ministry will develop a risk-based approach to assessing and addressing environmental risks, similar to the approach in place for assessing physical hazards posed by these sites. Reporting on progress will be included in the annual report of the Chief Inspector of Mines and the Chief Permitting Officer.

Appendix B: Audit criteria

Objective 1: To determine whether the Ministry of Energy, Mines and Low Carbon Innovation developed adequate policies and procedures to address the key environmental risks of major mines identified in the 2016 audit of compliance and enforcement of the mining sector.

1. Enforceable Language

   1.1 The ministry had policies and procedures in place to write permits with enforceable language.

   1.2 The ministry developed a plan to update historical permits with enforceable language.

2. Compliance and Enforcement

   2.1 The ministry developed a plan outlining its regulatory approach to compliance and enforcement.

   2.2 The ministry developed a process for consistently monitoring all major mines for compliance with:

      2.2.1 Geotechnical reporting requirements

      2.2.2 Geoscience reporting requirements

      2.2.3 Reclamation reporting requirements

   2.3 The ministry developed a risk-based approach to inspection planning.

   2.4 The ministry developed policies and procedures for inspections of major mines to verify compliance with:

      2.4.1 Geotechnical requirements

      2.4.2 Geoscience requirements

      2.4.3 Reclamation requirements

   2.5 The ministry developed policies and procedures to consistently respond to serious incidents.

   2.6 The ministry developed tools for addressing non-compliances.

3. Evaluation and Continual Improvement

3.1 The ministry developed a process for evaluating the effectiveness of its environmental compliance and enforcement activities.

3.2 The ministry developed a process to support the implementation of recommendations made by the Audit Unit regarding continual improvement of its environmental compliance and enforcement activities.

4. Reclamation Security

4.1 The ministry developed a reclamation security policy that articulates its liability risk tolerance for major mines.

4.2 The ministry developed a plan to narrow the gap between province-wide reclamation liabilities and reclamation securities for major mines.

5. Reporting

5.1 The ministry reported annually on environmental compliance activities as per the Act.

5.2 The ministry publicly reported on audits as per the Act.

5.3 The ministry reported annually on the estimated liability and security held for each major mine.

Objective 2: To determine whether the Ministry of Energy, Mines and Low Carbon Innovation developed an adequate framework to address potential public safety and environmental concerns at abandoned mines.

6. Abandoned Mines

6.1 The ministry developed a program to address the potential public safety and environmental concerns at abandoned mines.

6.2 The ministry developed a risk-based approach to address public safety and environmental concerns at abandoned mines.

6.3 The ministry reported on work done to address public safety and environmental concerns at abandoned mines.

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