Mining Skills Innovation Research Project

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MABC
MINING ASSOCIATION OF BRITISH COLUMBIA

CTEM
CENTRE OF TRAINING EXCELLENCE IN MINING

The Mining Skills Innovation Research Project was led by the **Mining Association of British Columbia**.

in partnership with
BC Centre of Training Excellence in Mining.

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Executive Summary

British Columbia's (B.C.'s) mining industry is entering a period of significant opportunity, driven by growing global demand for critical minerals essential to the clean energy transition.

With 18 operating mines, two smelters and 31 new or expanding projects in development, the sector is positioned to generate substantial economic activity across the province. B.C.'s mining workforce of nearly 30,000 represents just one per cent of the province's total workforce, yet its contribution to the province's economy and social infrastructure is substantial.

This workforce generates $18 billion in annual economic activity and over $3 billion in annual revenue for the government, placing mining workers among the highest per-worker economic contributors when compared to other industries.

This essential workforce continues to face declining numbers, an issue that emerged in the 2010s due to pressure from retirements, competition from other sectors, and limited training capacity, particularly in rural and remote regions where mining activity is concentrated. These pressures are compounded today by plans of new and expanded mining projects across the province, many of which may be at risk of delays or advancing due to a lack of skilled workers.

The Mining Skills Innovation Research Project (MSIRP) was launched by the Mining Association of British Columbia (MABC) and the Centre of Training Excellence in Mining (CTEM) to better understand these challenges and identify practical, industry-aligned solutions. The project brought together industry, training providers, communities and government partners to examine labour market demand, training capacity and global models for accelerating skills development.

Research was organized into three workstreams:

1. **Labour demand and supply analysis,**
2. **Sector skills and training capacity assessment and**
3. **Development of a workforce development accelerator framework.**

The labour market demand and supply analysis shows that B.C.'s mining workforce will face significant hiring pressure over the next decade. In 2024, approximately 29,000 people were employed in mining. Under baseline growth assumptions (a scenario where current trends continue), employment is projected to reach 34,400 workers by 2035, which equates to a cumulative hiring need of 35,000 new workers over the next ten years once retirements and turnover are factored in.

Twenty critical occupations — including heavy equipment operators, truck drivers, underground miners, millwrights, electricians, geoscientists and mining engineers — represent more than half of the mining workforce and are already difficult to fill. Labour supply projections indicate that B.C.'s overall workforce will expand, but mining's share of it will remain at roughly one per cent of the provincial labour pool.

At the same time, only five per cent of B.C.'s total labour supply are able to fulfill the 20 critical occupations that mining relies on. As a result, the industry currently depends on out-of-province workers for 28 per cent of its workforce — a proportion likely to increase without targeted intervention.

Skills analysis highlights mining's reliance on technical competencies such as equipment operation, quality control and process monitoring, as well as physical and cognitive abilities like depth perception and spatial visualization. These skills overlap with other sectors, creating both competition for talent and opportunities for worker mobility.

Understanding the training ecosystem is vital to a coordinated response. A survey and key informant interviews allowed for a B.C. specific understanding of the gaps, along with opportunities and priorities identified by individuals working in and connected to B.C.'s mining training ecosystem. Training capacity and barriers were explored particularly in the Cariboo and Northcoast/ Nechako regions where mining is active, and projects are at varying phases of development.

The research participants stressed that to be adaptable to the real needs of the local mining workplace, the prioritization of accessible, flexible and locally delivered training will be essential. The importance of removing and mitigating less visible training barriers (e.g. financial and housing insecurity, transportation and childcare supports), expanding and modernizing how training is delivered, responding to the needs of learners, and creating clear, accessible pathways into mining careers were suggested as ways to expand the pool of potential workers.

B.C.'s opportunity lies in learning from and applying global best practices while adapting to local strengths. The province already has significant advantages: an established industry presence, strong presence of training providers and growing government commitment to skills development. A well-designed mining specific workforce development accelerator could transform these assets into a sustainable competitive advantage.

To help mitigate the challenges in growing the B.C. mining workforce, the B.C. Mining Training Accelerator is proposed. Based on global best-practices, the accelerator will align industry, post-secondary training providers, communities and workforce agencies; provide modular and community-based training; integrate simulation and digital learning technologies; support entry into the workforce; enable skills development for career growth and leadership development; and use labour market intelligence to anticipate future skills needs. These long-term approaches must be matched by near-term focus on flexible, adaptable and scalable training opportunities that target the sector's most critical occupations and skills needs through collaboration between training organizations and industry.

The B.C. mining sector is at a pivotal moment. Without coordinated action, labour and skills shortages will constrain the province's ability to respond to global demand for critical minerals. The B.C. Mining Training Accelerator offers a practical model to strengthen workforce development, support inclusive participation and ensure the sector can meet both current and future labour needs.

Introduction

Mining development represents a significant economic opportunity for British Columbia (B.C.), with the province positioned for sustained growth driven by global demand for critical minerals essential to the clean energy transition. B.C.'s 18 operating mines and two world-class smelters generate $18 billion in annual economic activity in the province, accounting for 28 per cent of the province's goods exports. Today, B.C.'s mining sector faces an unprecedented convergence of opportunity and challenge. Strong global demand for critical minerals is driving plans for 31 new mines or mine expansions, some of which are underway.

B.C.'s mining industry employs nearly 30,000 workers across the province and while B.C.'s mining workforce is a small part of the total provincial workforce (approximately one per cent) the contribution of B.C. mining jobs to the economy and communities cannot be understated, particularly its contributions to B.C.'s rural and remote regions where mining activity is concentrated.

The sector now faces a growing challenge that threatens its ability to sustain its contribution to the economy and realize its future potential. Demand for skilled labour is rising across a range of occupations, yet existing training, workforce development systems and policies are struggling to keep pace. Without timely and innovative action, shortages of the skills and abilities needed across B.C.'s mining workforce have the potential to substantially limit industry growth.

The Mining Skills Innovation Research Project, led by the Mining Association of British Columbia (MABC) in partnership with the Centre of Training Excellence in Mining (CTEM), was developed in response to this challenge. The project brought together industry, training organizations and community representatives to better understand labour market demand and supply, identify barriers to training delivery and explore practical solutions to strengthen the mining workforce pipeline.

Central to this work is an understanding of the mining training ecosystem — the interconnected network of employers, training providers, communities, government agencies, policies, funding models and infrastructure that together shape how skills are developed and accessed. While B.C.'s training ecosystem is structured to meet the needs of a workforce where large quantities of workers are regularly and consistently needed (i.e. trades, nurses, accountants, engineers), it has yet to fully address the unique complexities of B.C.'s mining industry.

The B.C. mining industry includes approximately 120 different careers, each requiring different content and time commitments to develop skilled workers. Training needs are often dependent on specific projects and tied to specific regions with varying development timelines. Industry-experienced trainers are hard to find for both industry and post-secondary training institutions. Training is delivered at different locations and settings depending on the type of job (i.e. on-site training for technical skills, post-secondary training providers for diplomas and degrees and a blend of both for trades and micro-training). In addition to this, the physical, financial and social barriers to training can be numerous and often compounded for learners.

The complexities of the B.C. mining training ecosystem are further intensified due to the industry's project-driven needs where the training ecosystem must expand to meet the current and growing demand and then decrease once the need is met.

These challenges facing the training ecosystem in mining point to the need to move beyond traditional training approaches and towards more coordinated, supported and agile industry-driven solutions, including models that can accelerate and align training with emerging economic opportunities, respond quickly and nimbly to industry needs and support inclusive participation in a rapidly evolving mining sector.

As an industry already facing the challenge of a workforce that continues to age and exit and 27 new projects in the development and permitting pipeline, B.C. needs to ensure it has the workforce with skills in place to safely deliver on B.C.'s Critical Minerals Strategy and the Canadian Critical Minerals Strategy as well as support B.C.'s and Canada's response to current and future economic influences.

The document provides an overview of the findings of this project, with reference to additional supplementary information where applicable. The first section outlines the key questions and approaches to the research project. The second section provides a review of the key findings and conclusions across the three "workstreams." The final section provides initial recommendations on how these findings may be utilized to pursue tangible next steps.

The Mining Skills Innovation Research Project was funded by the Government of Canada's Future Skills Program.

RESEARCH APPROACH

Project Objectives and Deliverables

The Mining Skills Innovation Research Project had three objectives with dedicated workstreams. Each workstream was tailored to explore a central research question. By integrating the workstreams, the project brought together new, mining-specific labour market information, insights from individuals deeply connected to the mining training ecosystem and best practices in training accelerators from around the world.

This work produced three consolidated workstream deliverables:

1. A labour supply-demand analysis across key skills areas to identify the most critical supply gaps in key occupations or competency areas where an increase in skills supply will be required.
2. A primary research study to understand the sector training capacity and the opportunities and barriers to meet supply gaps, building on the previous findings of the 2023 CTEM Skills Roadmap Project[1].
3. An exploratory research study examining use of emerging technologies and international workforce development accelerator models to drive targeted and innovative skills development solutions.

Together, these inputs inform the business case for development of a mining-sector training accelerator model designed to strengthen coordination, improve access, relevance, and support the long-term sustainability of mining-related training across British Columbia.

1 https://bc-ctem.ca/project/skills-road-map-project/

1	**Project Objective**	**Understand the B.C. mining industry skills need**
	Workstream #1	**Sector Demand and Supply Capacity Assessment**
	Research Question	What are the critical occupational and skills/competencies demand-supply gaps resulting from accelerated development of critical minerals and precious metals mines over the next ten years?
2	**Project Objective**	**Understand the regional training capacity**
	Workstream #2	**Sector Skills/Competency Needs Benchmarking Study**
	Research Question	What are the limitations and capacity constraints for addressing the gaps (e.g. not enough training, barriers to training and job development, regional infrastructure)?
3	**Project Objective**	**Develop a skills accelerator framework to meet a mining regional need**
	Workstream #3	**Workforce Development Accelerator Framework**
	Research Question	How can leading frameworks for successful, new skills training practices and technologies fill both these known and emerging skills needs in a way that is flexible, agile and accelerated to meet current and future industry needs?

Project Delivery and Governance

The project, led by the Mining Association of British Columbia (MABC) in partnership with the Centre of Training Excellence in Mining (CTEM), provided an industry-led perspective on training needs and delivery. The three research workstreams within the project were undertaken by project partners the Mining Industry Human Resources Council, PHC Inc. and Propero Learning Systems Inc.

Each project partner brought extensive experience in their research subject area and a strong track record of delivering on engagement-based projects involving multiple stakeholders and complex technical components. MABC, CTEM and project partners met frequently over the course of project design and execution to align workstream deliverables within a collaborative work schedule. This approach ensured consistent and relevant feedback on the broader project objectives and created numerous opportunities for collaboration across workstreams to accommodate known research interdependencies.

This delivery approach was supported through the oversight of the Mining Innovation Advisory Committee (MIAC), which provided technical advisory expertise within the B.C. mining context throughout the project. The MIAC was comprised of members representing diverse perspectives and knowledge from:

- Industry (exploration, development, and operating mines across multiple commodities)
- Labour (union and human resources)
- Training providers (public post-secondary trainers, site trainers and community training)
- Provincial government (Ministry of Critical Minerals and Ministry of Post-Secondary and Future Skills in an ex-officio capacity)

Complementing the direct subject matter expertise, the MIAC participants included a diversity of Indigenous backgrounds, genders and regional representation.

During the project, MIAC members participated in five meetings aligned with project workstream research, facilitating the opportunity to review methodology and outputs from each workstream in collaboration with the project partners. In addition, ad hoc briefings and topic-specific meetings allowed for further interactions on issues relevant to members' expertise. This structure allowed for review of initial findings and perspectives on project impact and recommendations as the project progressed.

The findings and conclusions of the research workstreams are provided in the following section. All tables and figures referenced are available in the appendix.

Project Partner	Responsibility
MiHR RHiM	**Workstream 1** Sector Demand and Supply Capacity Assessment
PHC Inc.	**Workstream 2** Sector Skills/Competency Needs Benchmarking Study
Propero Learning Systems Inc.	**Workstream 3** Workforce Development Accelerator Framework

RESEARCH FINDINGS

This section details the findings and conclusions associated with each workstream. The findings provide a unique look at the challenges and opportunities within the B.C. mining training ecosystem and lay the groundwork for improved decision-making at both the individual and organizational levels and a tactical approach to accelerate training in the mining sector provincewide. Initiatives built on these findings can help industry secure its future skills needs while also supporting individuals in developing necessary, job ready skills and abilities in a direct and applicablefashion. These initiatives are detailed in the sections that follow.

WORKSTREAM 1

Sector Demand and Supply Capacity Assessment

Workstream Overview

This workstream provided an evidence-informed assessment of the current and future estimates of mining sector labour demand and supply, focusing on the critical occupations and the skills and abilities that are anticipated to be most required over the next ten years. The key findings that follow summarize a full analysis that can be found at https://bc-ctem.ca/.

Forecasting Mining Labour Demand Scenarios

To forecast labour demand, MiHR employs two complementary approaches: an econometric method and a project-based method. Each offers distinct insights and together they create a comprehensive and nuanced picture of mining workforce needs in B.C. over the next ten years.

MiHR's econometric forecast approach estimates labour demand based on historical relationships between mining employment and economic drivers such as energy prices, domestic exports, and global market conditions, along with projections of future industry growth. MiHR estimates that 29,000 individuals were employed in the mining sector[1] in 2024.

Employment forecasts were generated using three distinct demand scenarios between 2024 and 2035:

- **Baseline:** Net employment rises to 34,400 in 2035, a 19 per cent increase
- **Expansionary:** Net employment rises to 42,000 workers, a 45 per cent increase
- **Contractionary:** Net employment declines to 26,800 workers, a seven per cent decrease

Furthermore, considering the cumulative hiring requirements, which is the net change in employment plus replacement hiring requirements due to retirements and workers transitioning to other sectors, B.C.'s mining sector will need to hire 35,000 new individual workers over the next decade just to meet the baseline demand for net employment.

The mining industry's hiring needs are complex, with over 120 careers identified by MiHR. Assuming stability in the composition of critical roles over the next decade, the research identified occupations with the largest hiring need and those that were most challenging to fill. These top 20 critical occupations represent about 55 per cent of the sector's total workforce.

Demand for these critical occupations (e.g. heavy equipment operators, mining engineers, and geologists) represent a substantial share of future mining labour demand — but by no means the totality of demand anticipated. Detailed forecasts for the 20 occupations and forecasted demands are in Table 1 of the appendix.

This forecast has been supported by a parallel project-based analysis which individually examined the progression of 49 identified mining and exploration sites across B.C. This analysis confirmed a sharp employment surge — particularly between 2029 and 2032 — under optimistic assumptions and more moderate demand under pessimistic assumptions. It also validated the assumptions provided under the econometric model and revealed the challenge of the influx and contraction of the number of hires based on project development, expansion approval, or closure.

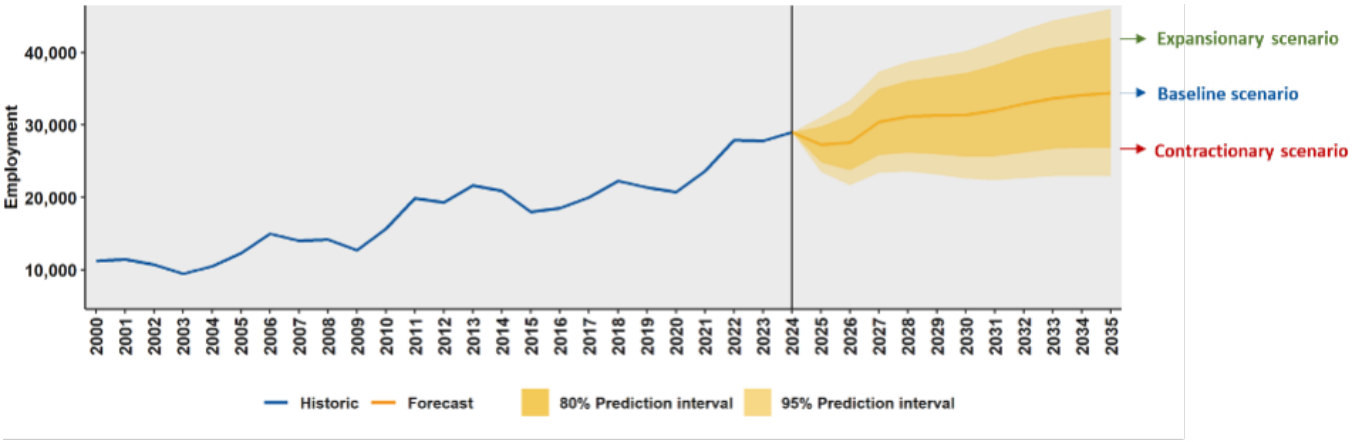
Estimating the Mining Labour Supply Outlook

MiHR's labour market supply analysis model incorporates conservative assumptions based on historical trends, including population growth, labour force participation, unemployment rates and occupational choices.

The model forecasts that B.C.'s total labour supply is projected to grow by 17 per cent, from 2.85 million in 2024 to 3.33 million in 2035, driven largely by immigration-based population growth. Mining's share of B.C.'s total labour supply is expected to remain at about one per cent.

1 Employees included in this measure include: Mining and Quarrying (activities at operating mines across B.C., including both surface and underground mining operations), Mining Support Activities (activities of organizations providing support services for a wide range of mining activities, usually on a contract or fee basis) and Primary Metal Manufacturing (comprises establishments engaged in smelting, refining, and processing ferrous and non-ferrous metals (e.g., copper, aluminum, and other alloys) to produce basic metal products used in manufacturing.

HISTORIC (2000 – 2024) AND FORECASTED (2025 – 2035) EMPLOYMENT FOR B.C.'S MINING SECTOR, DEMAND SCENARIOS



Source: Mining Industry Human Resources Council, British Columbia Mining Labour Market Analysis, 2025; Statistics Canada, System of National Accounts (SNA), 2025.

For the 20 critical occupations analyzed, the overall B.C. labour supply will grow, but the mining sector will face significant challenges as it is projected to capture a limited fraction of the provincial workforce. Of the projected 3.3 million workers that will make up B.C.'s labour supply, only five per cent are in the 20 critical occupations identified for mining, as shown in Table 2. These numbers highlight the challenges specific to the sector as it seeks to secure its future workforce within B.C.'s domestic labour pool.

Finding Critical Labour Market Gaps

Based on the forecasted labour demand and supply, it is evident that there will be a continued imbalance between the available and required workforce within B.C., particularly within the 20 most critical occupations. This raises the question: to what degree can B.C.'s existing mining labour market sustain future growth?

In 2024 the B.C. labour market was only able to provide 72 per cent of the mining industry's labour demand, requiring the B.C. mining industry to rely on 28 per cent of its workforce entrants to come from outside the province. MiHR's baseline labour market forecast predicts that the share of B.C.-based mining workers will remain relatively stable, declining slightly from 72 per cent in 2024 to 71 per cent by 2035. These proportions shift dramatically under expansionary or contractionary scenarios and as they are provincial numbers, more detail is needed to reflect the regional workforce requirements.

In any economic scenario, if the objective is for the sector to maximize the participation of B.C.-based workers, the province will face significant challenges in obtaining the required number of workers without external support. Several factors drive and limit labour supply responsiveness during periods of high demand: baseline labour demand growth, population trends, labour force participation and occupational choices. Specific examples of the current and anticipated gap between B.C.-based labour supply and labour demand across the 20 critical mining occupations can be found in Table 3 of the appendix.

For B.C. to pursue an outcome where a higher proportion of mining workers are B.C.-based, two scenarios must be considered:

1. **Competition Scenario:** Growing mining's labour market share through increasing competition for workers with other provincial sectors. This involves tactics such as increasing wages, investing more in recruitment efforts and intensifying advertising campaigns.
2. **Collaboration Scenario:** Increasing the overall labour market supply to sustain growth across all sectors. This approach emphasizes labour force development by investing in career awareness, skills development and collective training within the province to grow the whole workforce to a level that supports a competitive and sustainable labour supply.

Table 4 in the appendix details mining's increased proportion of the existing labour pool across the 20 critical occupations under a competition scenario, as well as how the overall supply would need to increase across those same occupations under a collaboration scenario. To be successful, a blend of both approaches will be required under any focused BC mining workforce strategy and tailored depending on the occupation, region and specific needs of employers. There is no one-size-fits-all approach.

Analysis of Skills Needs for the Mining Sector

MiHR's skills analysis offers a structured way to quantify the capabilities most critical to B.C.'s mining sector and identify where gaps are likely to emerge. Using the OaSIS skills taxonomy, the analysis maps skills and abilities of occupations using the National Occupational Classification (NOC) system to help identify potential gaps and better align the labour pool with the needs of B.C.'s mining sector[2].

Figures 1 and 2 in the appendix compare the use of OaSIS skills and abilities in the mining sector (vertical axis) and other sectors (horizontal axis) in B.C. The findings show that mining relies heavily on technical skills such as Operation and Control, Quality Control Testing and Operation Monitoring of Machinery and Equipment. Similarly, abilities such as Depth Perception, Spatial Visualization, and Selective Attention rank among the most significant, reflecting the physical and cognitive demands of mining work.

Skills requirements also vary by occupation. For example, engineers require high proficiency across a broad range of technical and cognitive skills, while skilled trades such as industrial electricians, welders, and heavy equipment operators demand specialized technical skills combined with physical abilities. These insights highlight the need for targeted training and workforce development strategies to address both current and emerging gaps based on industry needs.

This analysis also showed there is a clear overlap in mining skills and abilities with other sectors, demonstrating both competitive pressure as well as the opportunity for transferability between industries. Figures 3 through 8 in the appendix shows a comparison between mining and the sectors it competes with for workforce attraction.

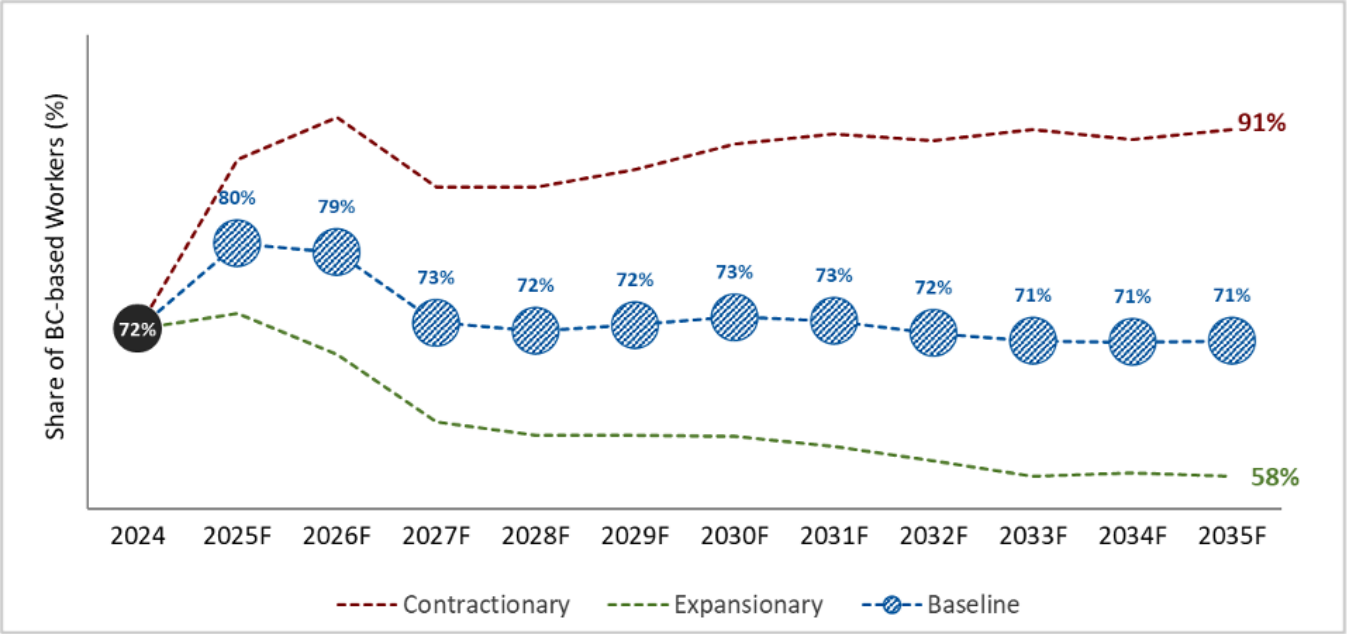
2 OaSIS is a database developed by Employment and Social Development Canada (ESDC) that provides ratings for worker characteristics (e.g., skills, abilities, work environment) associated with occupations.

TOP 20

Critical Mining Occupations

- Heavy equipment operators
- Transport truck drivers
- Underground production and development miners
- Supervisors, mining and quarrying
- Construction millwrights and industrial mechanics
- Heavy-duty equipment mechanics
- Managers in natural resources
- Welders and related machine operators
- Industrial electricians
- Geoscientists and oceanographers
- Senior managers - public and private sector
- Mine labourers
- Central control and process operators
- Machine operators, mineral and metal processing
- Geological and mineral technologists
- Mining engineers
- Underground mine service and support workers
- Industrial instrument technicians and mechanics
- Drillers and blasters
- Civil engineers

CURRENT (2024) AND FORECASTED (2025 – 2035)
SHARE OF B.C.-BASED WORKERS IN B.C.'S MINING SECTOR, DEMAND SCENARIOS



Source: Mining Industry Human Resources Council, British Columbia Mining Labour Market Analysis, 2025.

KEY CONCLUSIONS: PATHWAY TO MINING LABOUR MARKET SUSTAINABILITY

The B.C. mining industry is at a critical point. Labour market sustainability will require targeted strategies by occupation and a multi-faceted approach that combines competitive recruitment with collaborative workforce development to meet future demand. This analysis underscores the following conclusions:

Anticipated labour supply will not be able to respond to all demand

A forecast of labour market gaps reveals the specific occupations and underlying skills and abilities where the labour supply is unable to meet growing demand and will have to rely on out-of-province workers. This is particularly true in some of the sector's most critical occupations. If the objective is to achieve a strong representation of BC workers in the mining workforce, the mining sector should consider both competition and collaboration approaches to fill the gaps.

The priority for supply must be high-need occupations, skills and abilities

The research analysis offers a clear picture of which occupations, and the underlying skills and abilities, are most needed in B.C.'s mining sector. Heavy equipment operators, transport truck drivers, and underground production and development miners represent 21 per cent of the workforce, the largest proportion of the mining workforce. The largest skills gaps are in Operation and Control, Quality Control Testing, and Operation Monitoring of Machinery and Equipment while the largest abilities gaps are in Depth Perception, Selective Attention, and Spatial Visualization. Aligning training with these in-demand competencies would help build a better-equipped and more resilient labour market.

Occupation-specific strategies will be a necessity

The analysis shows that different occupations require multiple workforce strategies depending on the depth of their underlying labour pools. In occupations with shallow labour pools, the mining industry must focus on long-term collaboration strategies including expanding awareness, strengthening training pathways and developing new entrants to grow the workforce over time.

Occupations with deep labour pools are better suited to competition strategies where the existing provincial supply is technically sufficient for the mining industry to meet its growing demand, if mining can get a larger share of the labour force. Heavy equipment operators, for example, draw from a deeper labour supply, meaning employers might be able to rely on recruitment from other sectors with transferable skills relevant to mining such as construction, forestry and manufacturing, before pursuing supply expansion. In these cases, targeted attraction efforts, competitive compensation and improved workplace conditions are likely to be more effective than large-scale training investments.

WORKSTREAM 2

Sector Skills / Competency Needs Benchmark Study

Workstream Overview

Informed by the labour demand and supply analysis in Workstream #1, Workstream #2 focused on understanding the sector-specific skills needs and training capacity. Building on CTEM's 2023 Skills Roadmap Project, the research engaged the individuals that are doing the work on the ground — employers, trainers, community leaders and support organizations — to understand the gaps, opportunities and priorities in the B.C. mining training ecosystem.

Study Design and Engagement

The research aimed to better understand where current mining training approaches are falling short and to identify capacity constraints which include funding limitations, restricted training availability, barriers to accessing training and employment and regional infrastructure challenges in addressing skills gaps.

Data on training capacity and workforce needs was gathered directly from industry representatives, training providers, community leaders, and workforce development contacts. The research used a mixed-methods approach, combining a provincewide survey of individuals connected to B.C.'s mining training ecosystem with 10 targeted key informant interviews completed in two priority regions: the Cariboo and the Northcoast/Nechako regions.

The survey was distributed by the Centre of Training Excellence in Mining and the Mining Association of British Columbia in the fall of 2025 targeting contacts within the mine training ecosystem. The survey was distributed to approximately 100 contacts, and we received a total of 37 survey responses. The survey respondents included employers, trainers and partnering organizations with limited response from community leaders. As such, the findings are indicative rather than representative and should be considered alongside additional data sources, dialogue and future research, with caution on using the research findings to generalize.

The analysis focused on rural and remote mining-dependent communities to ensure regional perspectives were reflected. Engagement activities explored current and future skills needs, key training barriers and the prioritization of potential training strategies.[1]

Skills Needs and Occupational Demand

Across both employers and training providers, respondents indicated that the highest workforce demand continues to be concentrated in entry-level mine operators and labourers, heavy equipment operators, underground mining and drilling roles, mill processing, mineral processing, and positions related to environmental monitoring and safety. They also pointed to the growing need for emerging and future-facing skill sets, including the operation of automated and semi-autonomous equipment, digital literacy and data analytics, advanced control room operations, environmental compliance and monitoring technologies. Supervisory, leadership and management capability was consistently identified as one of the most critical gaps across all regions. This gap is most pronounced in relation to retention, succession planning and the missing middle decade of mid-career workers, where insufficient leadership readiness poses a risk to operational continuity and workforce sustainability.

Training Barriers

Respondents identified several systemic barriers that limited access to training and workforce development opportunities. Through the survey, respondents were asked to prioritize the training barriers as they perceived them.

1 The primary research study was designed in alignment with the Tri-Council Policy Statement on Ethical Conduct for Research Involving Humans and the First Nations principles of OCAP™ (Ownership, Control, Access, and Possession). The study was reviewed by an independent ethics review board and received unconditional approval in the summer of 2025.

PRIORITIZED TRAINING BARRIERS | SURVEY RESPONDENTS (N=37)

- Limited availability of local training
- Few qualified trainers
- Financial barriers
- Lack of awareness about available training opportunities
- Long travel distances and/or high transportation costs
- Insufficient supports of childcare/eldercare
- Lack of sufficient housing or lodging

Input from the key informant interviews added that financial constraints faced by the trainees, geographic remoteness, long travel distances and limited transportation options create significant challenges for training participation and completion, particularly for members of rural and remote communities. Loss of income during training and limited access to sustainable funding further restricted participation. Housing shortages in mining-adjacent communities intensify these challenges, while inconsistent funding — often driven by short-term pilot projects — undermine long-term planning and delivery.

Additional barriers highlighted by respondents included the inadequate recognition of credentials across provincial jurisdictions, insufficient access to modern training equipment, simulators and qualified trainers — all of which limit training quality and scalability.

Workforce Inclusion and Participation

Respondents indicated that learners of underrepresented groups such as women and Indigenous peoples experience overlapping and compounding barriers to participation in mining-related training. Barriers included limited access to childcare, transportation, housing and a lack of cultural safety and representation within training environments. Participants also highlighted the absence of visible role models in skilled trades and supervisory positions as a deterrent to participation and advancement.

In discussions with the key informants, there was strong support for community-based delivery models, fostering mentorship opportunities and culturally grounded training approaches, particularly for Indigenous learners. These approaches were viewed as essential to improving participation, retention and long-term workforce attachment.

Training Capacity and Delivery Models

When asked to prioritize a list of potential training solutions, local delivery of training programs, hands-on training and increased outreach about training opportunities were identified as the top priorities from the survey respondents.

Key informant interviews confirmed that current training capacity across the province is constrained by shortages of qualified instructors, limited physical infrastructure and the high costs associated with adopting emerging technologies.

Despite these challenges, several promising practices were identified including the use of mobile and on-site training units, hybrid and modular program delivery, micro-credentials and Prior Learning Assessment and Recognition. Strong collaboration between industry and post-secondary institutions was also identified as a key enabler of responsive and effective training delivery.

PRIORITIZED TRAINING SOLUTIONS | SURVEY RESPONDENTS (N=37)

- More locally delivered or mobile training programs
- More hands-on training tools (e.g. simulators, lab equipment)
- Increased outreach about training opportunities
- Financial support (e.g. tuition, travel and child care)
- Community-based training partnerships (e.g. with local schools or organizations)
- Flexible or modular training schedule
- Enhanced job placement or follow-up supports

Regional Spotlights: Cariboo and Northcoast/Nechako

To provide a fuller picture, recognizing that regions across B.C. have different micro-training ecosystems, labour needs and community infrastructure, this workstream examined the capacities of the Cariboo and Northeast/Nechako regions.

Cariboo Region

Research showed that labour demand in the Cariboo Region remains high for entry-level operators, labourers, and transitional roles. Recently the region has experienced workforce disruption due to forestry and mill closures, creating both challenges and opportunities for workforce transition. Emerging skill needs identified were automation, environmental monitoring and digital literacy.

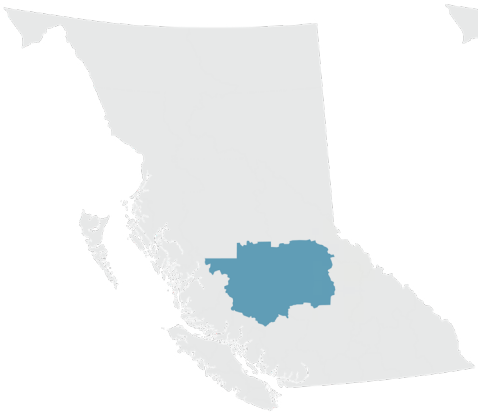
Training barriers in the region include transportation and housing challenges, income disruption during training, limited access to advanced simulation technologies and capacity constraints related to faculty and training infrastructure. Despite these barriers, several opportunities were identified, including the development of forestry-to-mining transition pathways, expanded use of mobile training delivery, growth in micro-credential offerings and the establishment of regional training hubs that leverage shared industry college and university infrastructure.

Northcoast and Nechako Regions

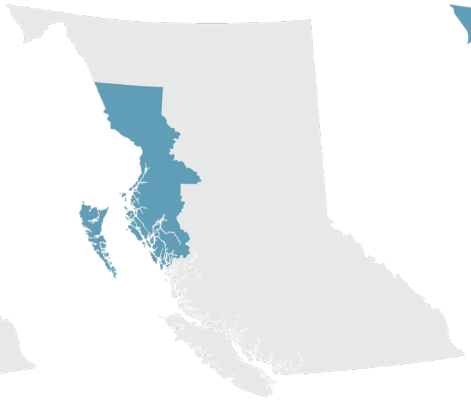
The Northcoast and Nechako Regions continue to experience high demand for skilled trades, millwrights, heavy equipment operators, engineers and supervisory roles. While the supply of entry-level labour is relatively strong, specialized and technical roles are frequently filled by non-local workers. Leadership, supervision and safety compliance were identified as critical skills gaps across the region.

Barriers identified include funding instability, high costs, geographic distance and limited transportation options. Childcare was consistently reported as the primary barrier to participation for women, alongside broader social and infrastructure challenges in remote communities. Opportunities in the region include the expansion of onsite training models, mentorship and internal advancement pipelines, forestry worker reskilling initiatives and community-based, modular training delivery formats.

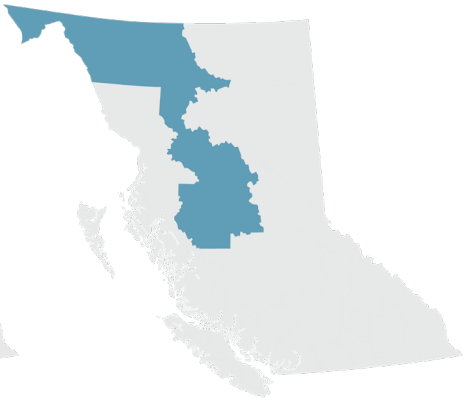
Cariboo Region



Northcoast Region



Nechako Region



KEY CONCLUSIONS: IMPLICATIONS FOR A TRAINING ECOSYSTEM

Overall, the study provided a clearer understanding of the mining sector's evolving skills needs and the capacity of training systems and communities to respond. It also helps identify both the shared challenges and regional differences across the training landscape.

One message was repeated consistently throughout the engagement: "If you invest in people, they will invest in the sector." Participants stressed the importance of removing less visible barriers, modernizing how training is delivered and creating clear, accessible pathways into mining careers. These insights help inform a future framework for training, emphasized in the following conclusions:

Prioritization of accessible, flexible and locally delivered training enabled through technology

Emphasis should be placed on ensuring training meets employers and workers where they are at, both geographically and practically. This means a focus on approaches that are more regionally based and adaptable to the real needs of the mining workplace. Regional training hubs are one example. Through these hubs, infrastructure in priority regions is shared between industry and training institutions, allowing for the co-location of equipment, classrooms and enabling technologies. This allows for access to standardized training across employers and the workforce.

Greater use of mobile, hybrid, and community-based delivery should also be enabled. Mobile training units allow for training to be delivered on-site or in-community, particularly benefitting remote and Indigenous communities. This approach allows trainers to deliver short-cycle, modular programming locally, with a blend of classroom, virtual and hands-on training models.

This approach can be extended to incorporate greater technology-enabled learning through the deployment of simulation and digital training technologies. Use of virtual reality and simulator access can target critical occupational learning needs such as underground mining and heavy equipment. Additionally, integrating digital literacy and data competencies into programs would align delivery with next-generation workforce learning styles.

Strengthen worker retention through inclusive leadership training

Retaining and developing the existing workforce will be equally important as developing a new workforce in the coming years due to competition from other sectors and other jurisdictions. In addition to competitive wages and conditions, the mining sector should also establish development pathways to retain and allow workers to develop additional skills and abilities.

In particular, the development of supervisory, leadership and succession pathways has been identified to retain and secure the existing workforce. Approaches may include targeted supervisor and frontline leadership micro-training or embedding mentorship and coaching into training models to build essential soft skills alongside more traditionally applied skills competencies.

Increasing representation from equity-deserving groups remains a priority for government, industry, and training providers within the mining sector, but existing training and workforce barriers also need to be addressed. To build a more equitable, diverse and sustainable mining workforce, consideration should be given to supporting internal advancement for women, Indigenous peoples and local workers. Recognizing the systemic barriers and needs of trainees and workers should be embedded into the design of worker training with a focus on addressing both access and retention barriers. In addition to targeted recruitment, successful approaches have included funding of community-based training models, development of scholarships, wrap-around support services such as funding for childcare, housing support during training, and mentorship networks for underrepresented groups.

Structured partnerships enabling sustainable funding and enhanced worker supports

Establishing stable, long-term funding mechanisms is essential to ensuring continuity, consistency and quality in training delivery. Recognizing that there is substantial competition for resources within the training system, multi-year operating funding will be required through structured partnerships between federal, provincial and industry investors. This could include moving away from large-scale investments in traditional infrastructure like buildings and pursuing cost-sharing models for simulation equipment and mobile units that can be scaled to meet multiple training needs.

To be successful, workers should be supported when participating in training. The negative impact of costs of childcare, transportation, housing and loss of income require direct supports to enable training to be undertaken without significant personal or financial sacrifice. Supports also need to assist in the development of essential core skills required to participate in skills training like literacy and drivers' licensing. These supports will ensure worker participation and improve the completion of training, particularly for equity-deserving learners.

WORKSTREAM 3

Workforce Development Accelerator Framework

Workstream Overview

Building on the outputs from Workstreams #1 and #2, this Workstream outlines the case for, and pathway to, the development of a B.C. workforce development accelerator. Designed as a coordinated regional system, it would enable industry to move beyond short-term pilot projects and instead towards a stable, scalable, and industry-aligned training ecosystem. A dedicated B.C. mining training accelerator is an innovative approach to establishing a coordination hub that connects industry, post-secondary training providers, communities and workforce agencies. It would operate as a talent pipeline system that aligns entry-level training with supervisory and leadership development needs, supporting long-term workforce sustainability across the mining sector. The accelerator could provide a platform to identify and pursue shared infrastructure and investments, including simulators and mobile training assets and provide a delivery model for modular, hybrid, and community-based training.

What is a Workforce Development Accelerator

A workforce development accelerator is a structured program or platform designed to rapidly develop, skill and empower individuals by providing intensive training, coaching and career support. They help organizations and governments close workforce gaps quickly, ensure competitiveness and foster community participation in growth industries. Worldwide, jurisdictions seeking to scale their workforce rapidly to meet emerging economic needs are turning to accelerators as ways to speed up the growth of skills, capabilities and career readiness, as well as drive the associated behavioural changes and abilities necessary to meet the changing needs of the economy.

Industry-driven accelerators function as sophisticated economic development tools because they address fundamental market gaps that limit both workforce development and business growth. The economic theory underlying their effectiveness is well-established: markets alone tend to underinvest in skills development as employers tend to focus more on hiring or recruiting existing skilled workers instead of investing and developing their own, while public partnership approaches often lack agility to respond to changing industry needs.

Accelerators bridge this gap by creating industry ownership of solutions while maintaining institutional support for training delivery. This approach generates positive externalities which are benefits that extend beyond direct participants to strengthen entire regional economies.

International examples of successful talent accelerators share common characteristics: industry leadership in governance, competency-based training frameworks, collaborative delivery models and strong connections to regional economic development strategies. These elements create sustainable ecosystems that benefit workers, employers and entire regions.

Cross-jurisdictional Analysis: Global Models of Excellence

The development of the B.C. Mining Training Accelerator would first build upon operational workforce development accelerators before adapting and tailoring it to the needs and attributes of the B.C. mining industry. Four jurisdictional approaches have been identified as potential models for B.C. as they provide the different dimensions of accelerator design essential to B.C. mining's unique challenges and opportunities. Analysis focused deliberately on jurisdictions facing comparable challenges such as resource-dependent economies, skills shortages in technical roles, geographic barriers to training access, workforce development imperatives and industrial transformation driven by technological advancement and environmental priorities.

The selected models represent those operating at sufficient scale and duration to demonstrate sustainability beyond pilot phases, with particular attention to mechanisms for anticipating future skills needs rather than merely responding to current gaps. These evidence-based models set the framework for a B.C. Mining Training Accelerator that combines proven effectiveness with adaptation to provincial contexts, ensuring both immediate workforce impacts and long-term transformation capacity.

Skillnet Ireland: Enterprise-led innovation
skillnetireland.ie

Ireland's approach to industry-driven talent development represents the gold standard for sector-specific workforce development. Skillnet Ireland operates through over 70 industry-led networks, each governed by businesses within specific sectors who collectively identify training needs and design solutions. This enterprise-led approach ensures training remains directly relevant to market demands while creating economies of scale impossible for individual companies to achieve alone.

The model's effectiveness is demonstrated through remarkable outcomes: 26,626 businesses have received upskilling support, generating 748,434 training days and reaching 14,021 workers through digital skills programs alone. What makes Skillnet particularly relevant to B.C. mining is its sectoral specialization, allowing networks to develop deep industry expertise while maintaining flexibility to respond to changing market conditions.

Skillnet's governance model places businesses at the center of decision-making while maintaining strong institutional support. Industry representatives chair networks, set strategic directions and ensure training aligns with real workforce needs. This business leadership is complemented by professional support from Skillnet staff who handle administration, funding coordination and quality assurance. Companies contribute directly to training costs, ensuring they value and utilize the outcomes, while government support enables broader participation and addresses market failures that might otherwise limit investment.

UpSkill Houston: Regional ecosystem development
houston.org/upskillhouston/

Upskill Houston's approach demonstrates how talent accelerators can function as regional economic development tools while maintaining industry specificity. The Greater Houston Partnership's talent pipeline management framework addresses skills needs across oil and gas, advanced manufacturing, petrochemicals, healthcare, construction, ports and maritime and utilities.

The program's sector-specific councils, formed by business leaders, shape training programs to align with industry evolution. These councils don't simply identify current skills gaps — they anticipate future needs based on technological changes, market trends and strategic business planning.

UpSkill Houston's comprehensive service model includes technical and soft skills training, career counseling, job placement assistance and ongoing support for both participants and employers. By creating pathways into multiple industries, UpSkill Houston strengthens the region's overall talent ecosystem, making it more attractive to business investment while providing workers with diverse career options.

METS Ignited: Innovation and workforce integration
metsignited.org

Australia's METS Ignited initiative illustrates how talent development can be integrated with innovation strategies to create comprehensive industry transformation. The program connects mining equipment, technology and services companies with educational and research organizations, creating pathways for both technological advancement and workforce development.

The governance structure combines industry leadership with formal institutional partnerships, ensuring that workforce development aligns with innovation priorities.

METS Ignited's competency framework approach provides a foundation for portable credentials while ensuring industry relevance. Workers can build skills incrementally through modular programs that stack into recognized qualifications, providing flexibility for both learners and employers.

The CCM-Eleva Alliance: Collaborative skills development at scale

ccm-eleva.cl

Chile's CCM-Eleva Alliance demonstrates how coordinated action between government, industry and educational institutions can create responsive training ecosystems that adapt to technological transformation while ensuring sustainable human capital development.

The alliance's structure brings together key government ministries, Chile's economic development agency (Corfo) and the Mining Skills Council (CCM) in a co-designed initiative implemented by Fundación Chile. This multi-stakeholder approach ensures training remains aligned with both industry needs and broader economic development objectives while responding to rapidly evolving sector requirements. Industry leadership manifests through the Mining Skills Council which provides standards and tools that adapt technical and professional training to labour market demands.

Chile's model emphasizes flexible, accessible program delivery that bridges education and employment. Over 50 technical and vocational training institutions receive support to improve training relevance and quality, while universities like Universidad de Chile have adapted mining engineering programs to prepare graduates for new technologies while emphasizing environmental conservation and sustainable development. The alliance's responsiveness to changing requirements is maintained through regular Mining Workforce Studies. This emphasis on skills transferability enables workers to transition between mining and other economic sectors, creating career resilience alongside industry-specific expertise.

Framework to Develop the B.C. Mining Training Accelerator

A B.C. Mining Training Accelerator will need to leverage and integrate key aspects to create a comprehensive accelerator that drives both immediate competitiveness and long-term transformation. Recognizing that sustainable workforce development requires interconnected components working synergistically while maintaining the agility to respond to technological advancement, environmental priorities and evolving market demands, the B.C. Mining Training Accelerator should be industry driven. Industry leadership is foundational to ensure training investments systematically address current skills gaps while building adaptive capacity for future industry transformation.

Eight components are necessary to form a framework to advance a talent accelerator to support B.C. mining:

1. Executive governance and industry leadership architecture

Create a robust governance framework where mining companies, suppliers and industry associations maintain clear leadership through executive council representation, sectoral working groups, advisory committees and regional nodes. This structure ensures comprehensive industry engagement while maintaining strategic accountability and decision-making authority for driving both operational excellence and transformational change.

2. Integrated competency and skills transformation framework

Develop a comprehensive competency-based model that addresses current technical requirements while anticipating future needs driven by technological change, environmental priorities and market evolution. This framework encompasses technical competencies, digital capabilities, ESG requirements, essential skills and adaptive leadership capabilities, providing foundations for credential recognition and dynamic career pathway development.

3. Collaborative network operations and infrastructure

Leverage B.C.'s existing training infrastructure through strategic partnerships while building specialized capabilities for emerging needs. This network approach coordinates training providers, mobile capabilities and virtual platforms to maximize cost-efficiency and geographic coverage while maintaining responsiveness to evolving training requirements and industry transformation.

4. Comprehensive inclusion strategy

Incorporate meaningful pathways for underrepresented and residents including wraparound supports during training and in the workplace while implementing targeted strategies that address systemic barriers and create authentic career development pathways. This component integrates Traditional Knowledge and local knowledge with technical training while ensuring flexible, culturally appropriate approaches that support underrepresented and local participation in industry transformation.

5. Advanced technology integration and innovation

Incorporate cutting-edge training technologies that provide flexible, effective learning experiences while building adaptive capacity for emerging technologies. This includes virtual and augmented reality, simulation platforms, data analytics for personalized learning and anticipatory technology adoption that prepares workforce for industry evolution and competitive advantage.

6. Sustainable investment and partnership model

Explore and implement funded approaches with industry leadership, government partnership, and enterprise participation that ensure long-term viability while maintaining strategic industry control. This model balances shared commitment with transformation-focused resource allocation that drives both immediate workforce needs and adaptive capacity building.

7. Intelligence-driven market adaptation and response

Develop a sophisticated skills anticipation system that combines labour market intelligence with transformation planning to enable proactive identification of emerging needs. This system includes rapid response capabilities, continuous improvement processes and strategic adaptation mechanisms that ensure training investments remain relevant through industry evolution.

8. Impact measurement and strategic value demonstration

Implement robust measurement systems that track individual outcomes, business competitiveness enhancement, regional transformation effects, social-environmental impacts and adaptive capacity indicators. This comprehensive approach enables continuous improvement while demonstrating both operational value and transformation outcomes to all stakeholders.

KEY CONCLUSIONS: B.C. MINING TRAINING ACCELERATOR FOR COMPETITIVE ADVANTAGE

B.C.'s opportunity lies in learning from global best practices while adapting to local strengths. The province already has significant advantages: established industry presence, strong educational institutions and growing government commitment to skills development. A properly designed B.C. Mining Training Accelerator can transform these assets into a sustainable competitive advantage.

Prioritize strategic workforce development and talent acceleration for mining

The evidence from successful models worldwide shows that industry-driven talent accelerators don't just train workers — they transform entire sectors. They create the skilled workforce that enables innovation, attracts investment and builds the foundation for long-term economic prosperity. By leveraging the existing training ecosystem and supplementing as needed, it is more cost-effective and creates a dynamic ecosystem where systematic workforce development drives industry transformation through interconnected components that reinforce adaptive capacity while maintaining operational effectiveness.

A comprehensive training acceleration platform integrates enterprise training with transformational workforce planning. It emphasizes lifelong learning and adaptive skill development mechanisms while creating accessible pathways for middle-skill careers that drive business competitiveness and prepares the workforce for industry evolution in B.C.'s critical minerals sector.

This framework's strength lies in its combination of strategic integration principles with transformation-focused agility, enabling the mining sector to address immediate skills challenges while building competitive advantage through anticipatory workforce development.

Emphasize industry leadership and governance partnered with training organizations

For B.C. mining, if industry does not lead through strategic workforce development, it risks falling behind as global competition for both talent and investment intensify. The blueprint exists, the evidence is compelling and the opportunity is unprecedented. By establishing clear industry governance and leveraging existing B.C. infrastructure within an adaptive framework, this model positions it as both a reliable operational system and a catalyst for sustainable industry evolution.

Industry leadership should convene a founding consortium that combines major producers, junior mining companies, suppliers, technology and Indigenous economic development corporations to establish an executive council to oversee accelerator strategy, investment allocation and performance oversight. Funding architecture should balance industry investment with government partnership through a co-investment model that maintains industry control while enabling broader participation and addressing market gaps in skills development.

Develop competency infrastructure and activate the delivery ecosystem

The evidence from Skillnet Ireland, UpSkill Houston, METS Ignited and CCM-Eleva demonstrates that successful accelerators embed industry leadership, competency clarity and collaborative delivery from inception rather than retrofitting these elements later — making simultaneous advancement across these domains essential rather than optional.

This governance body should launch workstreams that develop an integrated competency framework mapping current and emerging skills requirements across technical, digital, environmental and leadership domains and formalize partnerships with B.C.'s post-secondary training providers to activate training capacity while identifying gaps requiring specialized solutions.

Demonstrate value through prioritized implementation

Implementation priorities must emphasize rapid demonstration of value alongside infrastructure for sustained transformation. The accelerator should launch targeted programs addressing critical bottlenecks using competency-based approaches that provide portable credentials while meeting immediate employer needs.

Simultaneously, the industry consortium needs to establish intelligence-driven market adaptation systems that combine labour market analysis with technology forecasting, creating capacity for anticipatory program development rather than purely reactive responses to skills gaps. Technology integration — including simulation platforms, virtual reality training and data analytics for personalized learning — should be embedded in program design from launch rather than added incrementally, ensuring B.C.'s mining workforce develops capabilities aligned with global best practices.

By pursuing governance formalization, competency development, partnership activation, program launch and funding sustainability simultaneously rather than sequentially, B.C. can compress the timeline from concept to impact while creating an accelerator positioned for both immediate workforce gains and long-term competitive advantage through adaptive capacity.

MOVING FORWARD

Advancing a B.C. Mining Training Accelerator

The work undertaken through this project leads to one main and undeniable conclusion: the B.C. mining industry will not be able to meet its future potential for the benefit of British Columbians without bold action to address the critical gaps in labour supply, which in part must be met through the development of new skills and abilities across B.C.'s workforce. While the existing training system in B.C. demonstrated many successes in getting the industry to where it is today, it is not equipped to deliver the scale and speed the industry is likely to require for the future. A robust and innovative training eco-system will be required to meet future needs, particularly as demand grows within B.C.'s regions.

B.C.'s opportunity lies in learning from global best practices while adapting to local strengths. The province already has significant advantages including an established industry presence, strong educational institutions, and growing government commitment to skills development. A properly designed approach led by and driven in partnership with industry can transform these assets into a sustainable competitive advantage.

Workstream #1 made a persuasive case for the gap between supply and demand in mining's most critical occupations. It further demonstrates the value in embracing a skills and abilities mindset when it comes to bridging that gap whether through refining how mining competes for existing skilled workers, or how it collaborates to develop the broader pool of skilled labour.

This mindset includes letting go of traditional biases towards comprehensive educational programming and established experience within the sector when it comes to training and recruiting qualified individuals, favouring instead the recognition and acceptance of learned skills, transferable skills from other jobs and sectors and fit-for-purpose training approaches (such as micro-training or credentialing) tailored to a given region, site, or individual.

Workstream #2 was similarly compelling in validating that the training system is subject to multiple and unique variables both in terms of how training is best delivered and how learners are best enabled to participate in that training. Recognizing and adapting to these unique variables can only be achieved through focused efforts by all parties:

- Training institutions to create learning opportunities that reflect industry needs, are available on-demand to align with industry cycles and flexible through modern delivery models which include flexible timing, online and virtual options.
- Industry to expand its own on-site training infrastructure and functionality and work with community-based partners to provide tactical skill-based training for new employees, apprenticeship opportunities for trades and financial support for training not available on-site.
- Government to bring financial and social supports to reduce barriers for workers to participate in training, while also ensuring the training ecosystem overall is responsive to emerging needs and opportunities between sectors.

Workstream #3 provided the opportunity to bring the above concepts together, recommending a solution that moves beyond traditional training approaches to align workforce development with economic growth while ensuring deep industry and community engagement. A comprehensive workforce accelerator platform for B.C. integrates enterprise training with transformational workforce planning through a focus on strategic partnerships. It emphasizes lifelong learning and adaptive skill development mechanisms while creating accessible pathways for middle-skill careers that drive business competitiveness and prepare the workforce for industry evolution in B.C.'s critical minerals sector.

The identification of the gaps in supply and systemic capacity to meet the sector's needs should be addressed. Utilizing the data and conclusions from this report, the sector should pursue urgent and nimble responses to reducing the gaps in these occupations through targeted and evidence-based training approaches. Critical occupations as identified by industry (such as equipment operators) should be prioritized for early wins in collaboration between training entities and individual mining sites within regions. The findings of this report can be instructive in supporting the sector in design-ing these training approaches to be flexible, adaptable and scalable across regions and the province.

Alongside these early actions this report also outlines the fundamental components of a B.C. Mining Training Accelerator that could be developed over a multi-year program as part of the B.C. Critical Minerals Strategy. This approach could be pursued first at a regional level and then expanded cross-regionally as mining projects advance. This would establish a comprehensive approach to complement and align existing and proven institutional and industry training pursuits.

Entities within industry and the training ecosystem will benefit from working as a collective unit. The depth of response and level of engagement at the research and analysis phases of the project provided a clear understanding that representatives and their organizations want to be engaged in a solution that supports industry needs. Governmental leadership is essential to align necessary resources and talent to navigate the unique complexities of the sector.

To meet the current and future needs and sustain the B.C. mining industry's workforce, the current training ecosystem needs to be utilized differently, evolved and expanded. It requires a solution that goes beyond traditional training approaches to embrace the proven model of industry-driven talent and workforce accelerators. There is an opportunity to support a workforce that spans every region across B.C., particularly in rural and remote regions where mining activities are concentrated and other sectors are being impacted.

The Mining Skills Innovation Research Project builds upon evidence-driven quantitative and qualitative research to offer a framework that will enable industry to collaborate and address the complexities of B.C.'s mining sector. The opportunity to act is now.

GLOSSARY OF TERMS

Abilities

The innate qualities or talents that a person possesses, such as creativity, problem-solving, or leadership.

Baseline scenario

A scenario used for comparison, based on current trends and expected conditions if no major changes occur.

British Columbia

A geographical boundary that defines the province of British Columbia as the most westerly province of Canada.

Competencies

The qualification of ability to apply a combination of skills and characteristics to do a specific task.

Contractionary scenario

A scenario that assumes slower economic activity, reduced investment or lower demand, leading to weaker growth or job losses.

Expansionary scenario

A scenario that assumes stronger economic growth, higher investment or increased demand, leading to faster growth and job gains.

Mining community

All communities in B.C. are considered B.C. mining communities as the B.C. mining industry impacts and connects with communities in all spaces and places within the province.

Mining industry

Organizations or individuals that work on some aspect of the mining life cycle within B.C. including exploration, extraction, processing of minerals and metals, closure and restoration of mining lands and organizations or individuals that support these activities through consultation or other service offerings.

Skills

Learned behaviors or actions that can be developed and improved over time, such as communication, computer programming, or cooking.

Training

The act of sharing knowledge or information specific to a topic.

PARTNER ORGANIZATIONS

& Researcher Profiles

Partner Organizations

The Mining Association of BC (MABC) as project sponsor, is the voice of B.C.'s steelmaking coal, metal and mineral producers, smelters and advanced development companies. MABC has extensive experience as convener on behalf of and with both pro-vincial and federal governments in execution of multi-party research projects such as the Mining Innovation Roadmap and has demonstrated capacity to align industry with major initiatives that advance the interests of mining and mining communi-ties provincewide.

The Centre of Training Excellence in Mining (CTEM) as primary project partner and co-lead plays a leading role in understanding industry skills requirements, facilitating industry-driven training, building and supporting strategic partnerships. CTEM brings substantial experience in convening subject matter experts in the mining training eco-system to develop detailed research out-comes as profiled through the recent design and development of the Mining Skills Roadmap Project.

The Mining Human Resources Council (MiHR) is an independent, not-for-profit organization that specializes in identifying and addressing the human resource and labour market challenges facing the Canadian minerals and metals sector. MiHR's cus-tom labour market research and consulting services, as demonstrated through projects such as their annual Canadian Mining Outlook, have been used by mining employers, post-secondary educational institutions, governments, industry associations, Indigenous organizations and community representatives to understand their unique labour market challenges and develop effective training and recruitment strategies.

PHC Inc. is a boutique firm that consults on workforce and training development for individual companies, provincial sector wide initiatives and demographic/topical multi-sector initiatives. It brings a seasoned focus on respectful and safe workplaces having supported companies and sectoral groups through their labour focused initiatives.

Propero Learning Systems Inc. is a management consulting firm with extensive experience in workforce development, research and program implementation. Research leads collectively brought decades of experience in public policy, educational delivery and collaborating on large-scale research projects with access to specialized resources in data analytics, technology integra-tion, stakeholder engagement and project management.

Researcher Profiles

Jay Schlosar, BA, MA

Jay is Principal of JMS Strategies Group, which provides advisory services to resource companies and associations in the areas of governmental relations and public policy – including the Mining Association of BC. He previously served as an Assistant Deputy Minister with the Province of BC as well as Director of Community and Indigenous Affairs for Teck Resources, Canada's largest diversified mining company. He holds Masters Degree in Political Science from the University of Victoria and a Diploma in Sustainable Development from Columbia University, New York.

Jill Budelli, BA, MBA

Jill is Executive Director of the Centre of Training Excellence and brings 20 plus years of industry experience centered within the mining ecosystem having represented training providers in British Columbia and exploration, development, and mining projects in Canada, the US, and Latin America. She has served on various industry boards, including one that held 13 years of service, three of them as Chair of the board. Jill has an MBA from Arden University, England that is preceded by a degree in geography with a concentration in sociology and additional credentials in mining studies, diversity and inclusion, and leader-ship from various Canadian organizations.

Jamie Wolcott, BA, MA

Jamie is the Director of Labour Market Information at MiHR, where he collaborates with industry stakeholders to research and forecast labour market trends in Canada's mining industry. With extensive experience in labour market research, Jamie is dedicated to leveraging data and insights to inform decision-making and drive positive outcomes for the mining industry and the Canadian economy.

Gustavo Jurado, BA, MA

Gustavo is MiHR's Senior Labour Market Economist and plays a central role in labour market research and forecasting for Canada's mining industry. He brings over seven years of experience analyzing labour market trends and has worked with private sector partners, government agencies, and industry associations across Canada. His research focuses on skills shortages, the mining postsecondary education pipeline, and the impacts of technology on the workforce, among other topics.

Vickey Sobhani, BA, MA

Vickey is a Labour Market Economist at MiHR. Vickey contributes to the research, analysis, and interpretation of labour force data to explain economic conditions and forecast labour market trends in Canada's mining industry, applying econometric models and statistical techniques. She brings experience in private sector market analytics, as well as public sector economic assessment and management consulting across all levels of government.

Courtenay Hughes, BBA, MASc

Courtenay is a Senior Consultant, Human Resources at PHC Inc., has led labour market research, workforce programing and policy initiatives for the Canadian mining sector at the national and regional level. Courtnay holds a Bachelor of Business Administration from Simon Fraser University and a Masters of Applied Science in Mining Engineering from the University of British Columbia. She has engaged and advised multiple mining industry committees and taskforces on building workforce capacity and addressing barriers, including the BC HR Mining Taskforce, Women in Mining, APEGBC's Gender Diversity Taskforce, CIM Diversity and Inclusion Advisory, AME's Board of Directors, CTEM, and WIM Canada.

D. Scott MacDonald, BEd, MBA

Scott is a Partner at Propero Learning Systems Inc., a management consulting firm addressing workforce development challenges. Scott is an experienced senior executive with over 30 years in education and public policy, including beginning as a classroom teacher in Vancouver and eventually serving as British Columbia's Deputy Minister of Education. He specializes in designing competency-based learning solutions aligned with employer needs and has a strong track record of building creative partnerships among educational institutions, governments, economic development agencies, industry associations, and not-for-profit organizations to deliver innovative skills-training solutions.

Dr. Curtis Clarke, PhD

Curtis is a Partner at Propero Learning Systems Inc., a management consulting firm addressing workforce development challenges. As a former Deputy Minister for Advanced Education, Education (K-12), and Solicitor General, Curtis has shaped transformative initiatives at the highest levels of government nationally and internationally – including serving as vice-chair of the OECD Education Policy Committee Bureau, representing the Canadian Council of Ministers of Education. With a PhD in Sociology from York University and graduate degrees from Queen's University (BA Hon, MA Sociology), Curtis combines rigorous academic grounding with pragmatic leadership experience to drive meaningful change in complex organizations.

APPENDIX

Tables and Figures

TABLE 1: HISTORIC (2024) AND FORECASTED (2035) LABOUR DEMAND IN BRITISH COLUMBIA'S MINING SECTOR, BASELINE SCENARIO

Occupation	Historic BC Mining's Labour Demand (2024)	Forecasted BC Mining's Labour Demand (2035)	Net Change in BC Mining's Labour Demand
20 critical occupations	15,925	18,898	2,973
Heavy equipment operators	2,576	3,058	481
Transport truck drivers	1,863	2,211	348
Underground production and development miners	1,372	1,628	256
Supervisors, mining and quarrying	1,171	1,389	219
Construction millwrights and industrial mechanics	1,161	1,377	217
Heavy-duty equipment mechanics	901	1,069	168
Managers in natural resources	768	912	144
Welders and related machine operators	754	895	141
Industrial electricians	717	851	134
Geoscientists and oceanographers	708	840	132
Senior managers - public and private sector	687	815	128
Mine labourers	584	693	109
Central control and process operators	505	600	94
Machine operators, mineral and metal processing	493	585	92
Geological and mineral technologists	457	542	85
Mining engineers	424	503	79
Underground mine service and support workers	334	396	62
Industrial instrument technicians and mechanics	197	234	37
Drillers and blasters	156	185	29
Civil engineers	97	115	18
All occupations in BC Mining	**29,010**	**34,431**	**5,421**

Source: Mining Industry Human Resources Council, British Columbia Mining Labour Market Analysis, 2025.

TABLE 2: HISTORIC (2024) AND FORECASTED (2035) OVERALL LABOUR SUPPLY IN BRITISH COLUMBIA

Occupation	Historic British Columbia's Labour Demand (2024)	Forecasted British Columbia's Labour Demand (2035)	Net Change in British Columbia's Labour Demand
20 critical occupations	147,696	172,514	24,818
Heavy equipment operators	14,422	16,846	2,423
Transport truck drivers	47,004	54,901	7,897
Underground production and development miners	1,431	1,672	240
Supervisors, mining and quarrying	1,095	1,279	184
Construction millwrights and industrial mechanics	8,505	9,934	1,429
Heavy-duty equipment mechanics	7,091	8,283	1,191
Managers in natural resources	2,141	2,501	360
Welders and related machine operators	10,840	12,661	1,821
Industrial electricians	4,072	4,756	684
Geoscientists and oceanographers	2,386	2,787	401
Senior managers - public and private sector	33,293	38,887	5,594
Mine labourers	587	686	99
Central control and process operators	511	597	86
Machine operators, mineral and metal processing	696	813	117
Geological and mineral technologists	1,123	1,312	189
Mining engineers	784	915	132
Underground mine service and support workers	351	410	59
Industrial instrument technicians and mechanics	966	1,129	162
Drillers and blasters	719	840	121
Civil engineers	9,679	11,305	1,626
All occupations in BC	**2,854,785**	**3,334,431**	**479,646**

Note: Minor discrepancies may occur due to rounding.
Source: Mining Industry Human Resources Council, British Columbia Mining Labour Market Analysis, 2025.

TABLE 3: HISTORIC (2024) AND FORECASTED (2035) LABOUR GAP IN BRITISH COLUMBIA'S MINING SECTOR, BASELINE SCENARIO

	HISTORIC			FORECASTED		
Occupation	BC Mining's Labour Supply (2024)	BC Mining's Labour Demand (2024)	BC Mining's Labour Gap (2024)	BC Mining's Labour Supply (2035)	BC Mining's Labour Demand (2035)	BC Mining's Labour Gap (2035)
20 critical occupations	11,444	15,925	4,481	13,373	18,898	5,525
Heavy equipment operators	1,850	2,576	726	2,161	3,058	897
Transport truck drivers	1,345	1,863	517	1,572	2,211	639
Underground production and development miners	995	1,372	376	1,163	1,628	466
Supervisors, mining and quarrying	843	1,171	328	985	1,389	405
Construction millwrights and industrial mechanics	844	1,161	317	986	1,377	392
Heavy-duty equipment mechanics	640	901	261	747	1,069	322
Managers in natural resources	560	768	208	655	912	257
Welders and related machine operators	539	754	215	630	895	265
Industrial electricians	526	717	191	615	851	236
Geoscientists and oceanographers	502	708	205	587	840	253
Senior managers - public and private sector	482	687	204	563	815	252
Mine labourers	420	584	164	491	693	202
Central control and process operators	360	505	146	420	600	180
Machine operators, mineral and metal processing	356	493	137	416	585	170
Geological and mineral technologists	327	457	130	382	542	160
Mining engineers	306	424	117	358	503	145
Underground mine service and support workers	229	334	105	267	396	129
Industrial instrument technicians and mechanics	142	197	55	166	234	68
Drillers and blasters	109	156	47	128	185	57
Civil engineers	69	97	28	81	115	34
All occupations in BC Mining	**20,901**	**29,010**	**8,109**	**24,413**	**34,431**	**10,018**

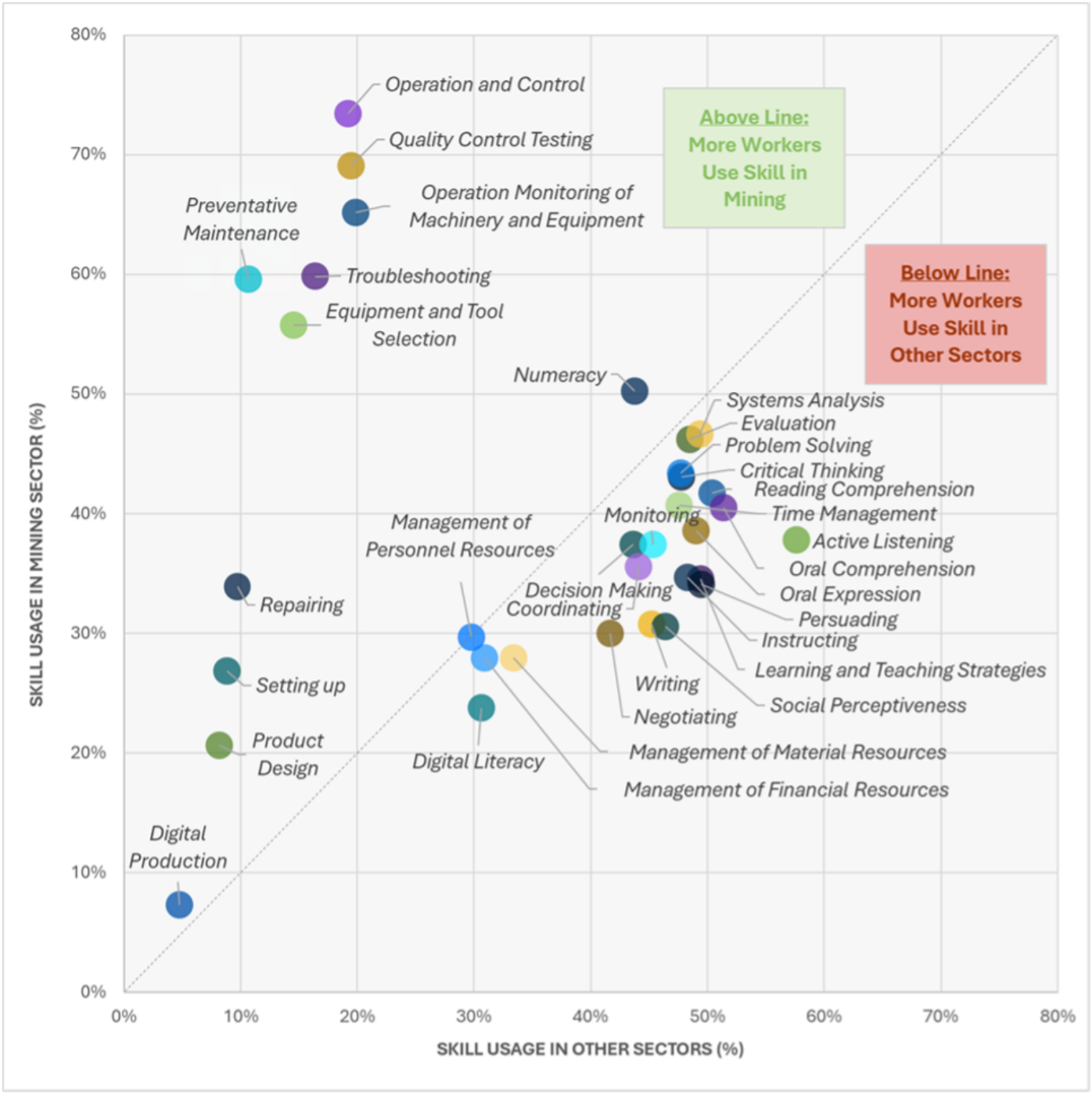
Note: Minor discrepancies may occur due to rounding.
Source: Mining Industry Human Resources Council, British Columbia Mining Labour Market Analysis, 2025.

TABLE 4: COMPETITION SCENARIO VS. COLLABORATION SCENARIO FOR CRITICAL OCCUPATIONS IN BRITISH COLUMBIA'S MINING SECTOR (2025 – 2035)

Occupation	Competition Scenario: Labour Gap (2025 - 2035)	Collaboration Scenario: Required Labour Supply Growth (2025 - 2035)
Heavy equipment operators	488 897	3,805 6,992
Transport truck drivers	345 639	12,043 22,339
Underground production and development miners	249 466	358 670
Supervisors, mining and quarrying	219 405	285 525
Construction millwrights and industrial mechanics	209 392	2,104 3,947
Heavy-duty equipment mechanics	178 322	1,974 3,568
Managers in natural resources	136 257	521 983
Welders and related machine operators	145 265	2,920 5,331
Industrial electricians	124 236	960 1,830
Geoscientists and oceanographers	140 253	667 1,204
Senior managers - public and private sector	141 252	9,757 17,369

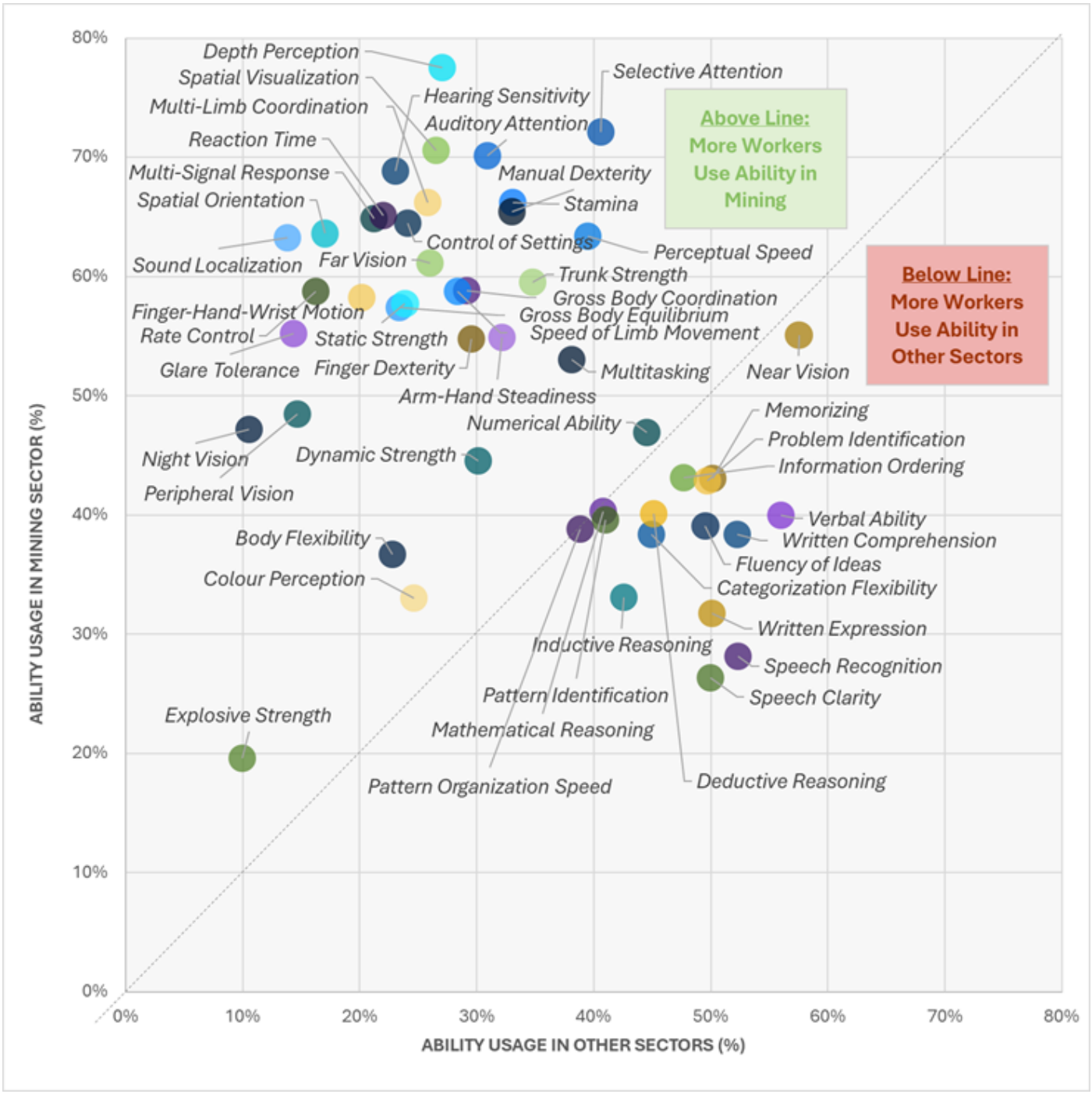
Source: Mining Industry Human Resources Council, British Columbia Mining Labour Market Analysis, 2025.

FIGURE 1: COMPARISON OF SKILLS PREVALENCE IN BRITISH COLUMBIA'S MINING SECTOR AND OTHER SECTORS (2021)



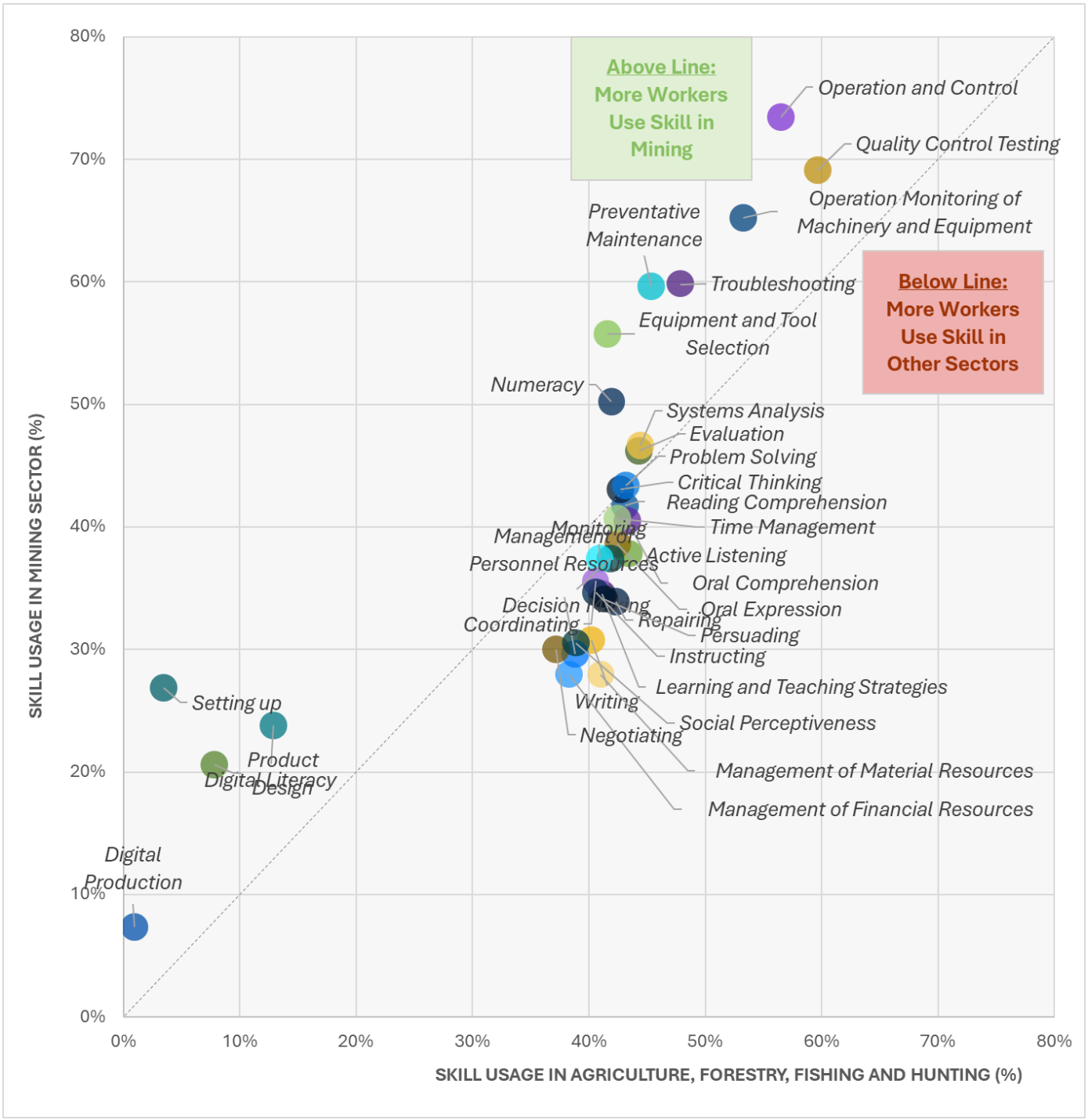
Source: Mining Industry Human Resources Council, British Columbia Labour Market Analysis, 2025; Employment and Social Development Canada, Occupational and Skills Information System (OaSIS), 2025; Statistics Canada, Census of Population, 2021.

FIGURE 2: COMPARISON OF ABILITIES PREVALENCE IN BRITISH COLUMBIA'S MINING SECTOR AND OTHER SECTORS (2021)



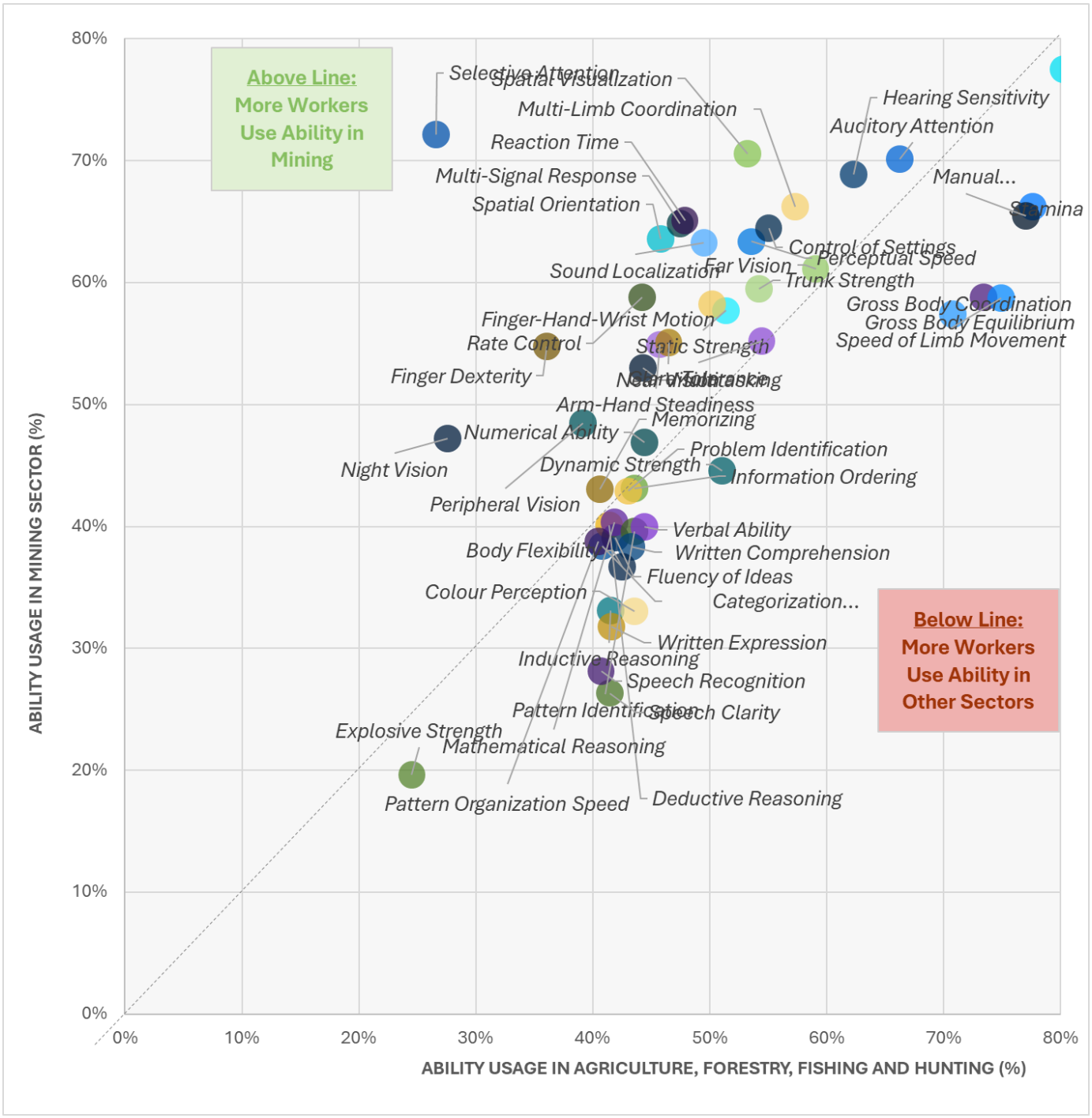
Source: Mining Industry Human Resources Council, British Columbia Labour Market Analysis, 2025; Employment and Social Development Canada, Occupational and Skills Information System (OaSIS), 2025; Statistics Canada, Census of Population, 2021.

FIGURE 3: COMPARISON OF SKILLS PREVALENCE IN BRITISH COLUMBIA'S MINING SECTOR AND AGRICULTURE, FORESTRY, FISHING AND HUNTING SECTORS (2021)



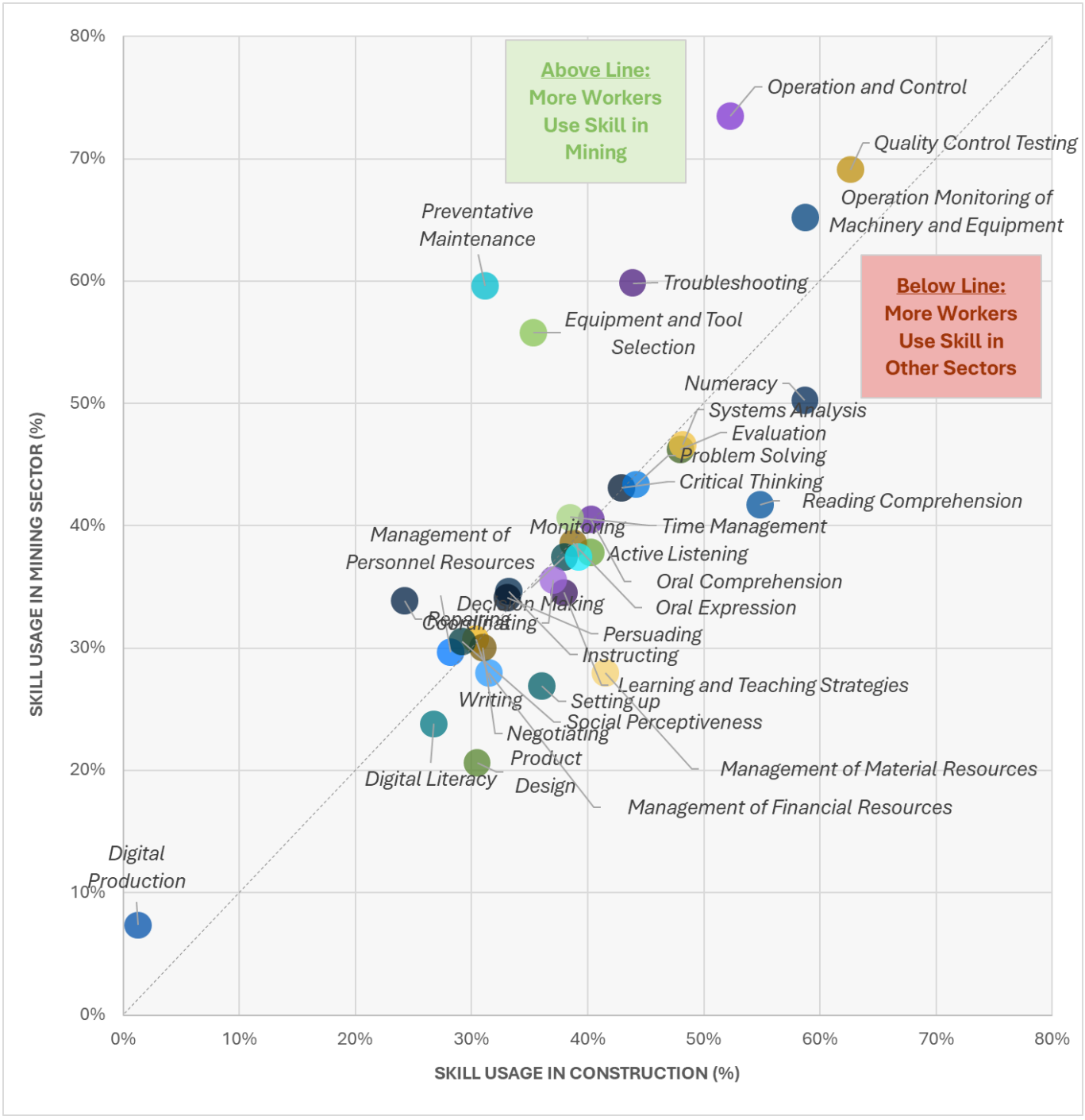
Source: Mining Industry Human Resources Council, British Columbia Labour Market Analysis, 2025; Employment and Social Development Canada, Occupational and Skills Information System (OaSIS), 2025; Statistics Canada, Census of Population, 2021.

FIGURE 4: COMPARISON OF ABILITIES PREVALENCE IN BRITISH COLUMBIA'S MINING SECTOR AND AGRICULTURE, FORESTRY, FISHING AND HUNTING SECTORS (2021)



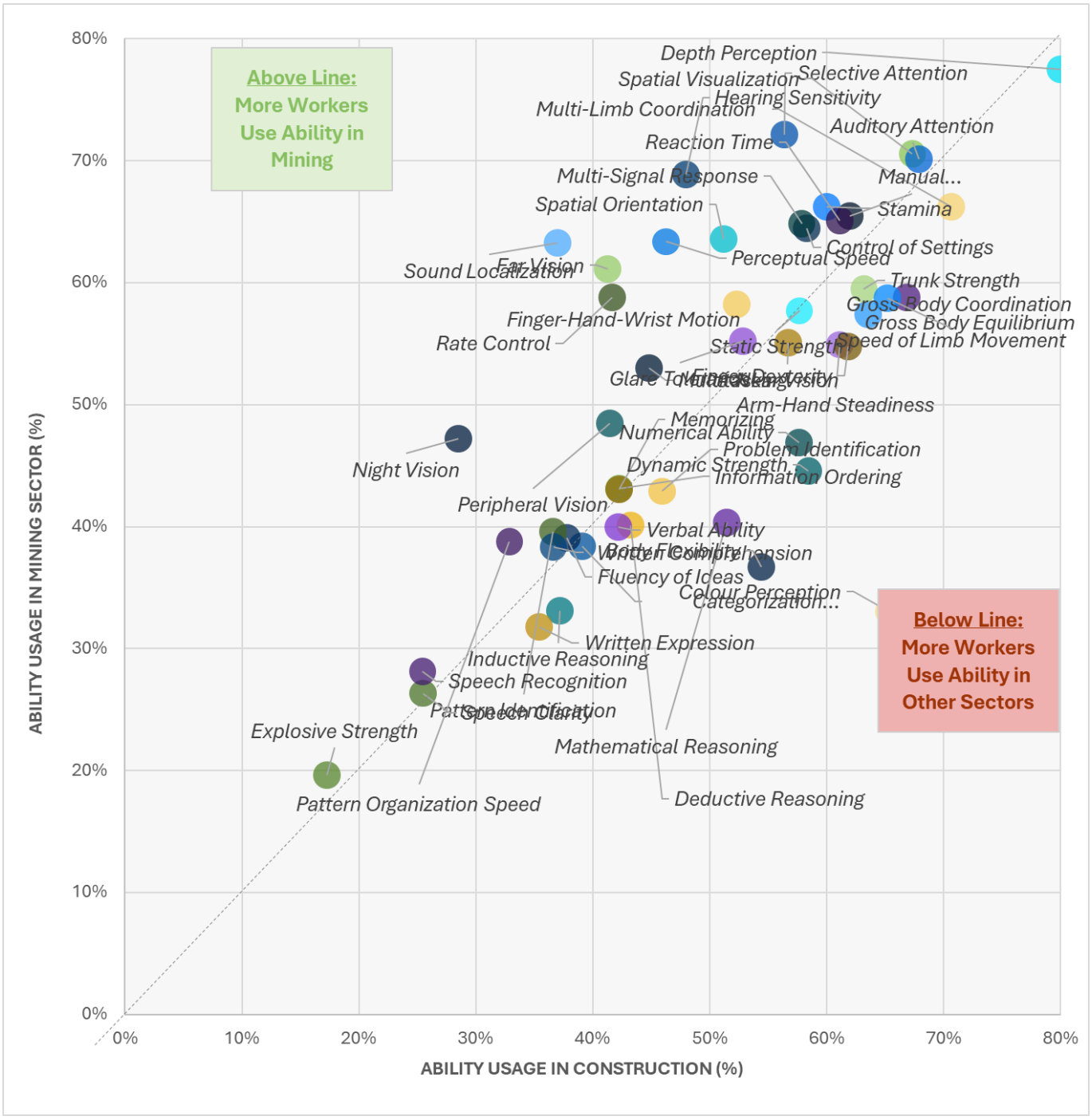
Source: Mining Industry Human Resources Council, British Columbia Labour Market Analysis, 2025; Employment and Social Development Canada, Occupational and Skills Information System (OaSIS), 2025; Statistics Canada, Census of Population, 2021.

FIGURE 5: COMPARISON OF SKILLS PREVALENCE IN BRITISH COLUMBIA'S MINING SECTOR AND CONSTRUCTION SECTOR (2021)



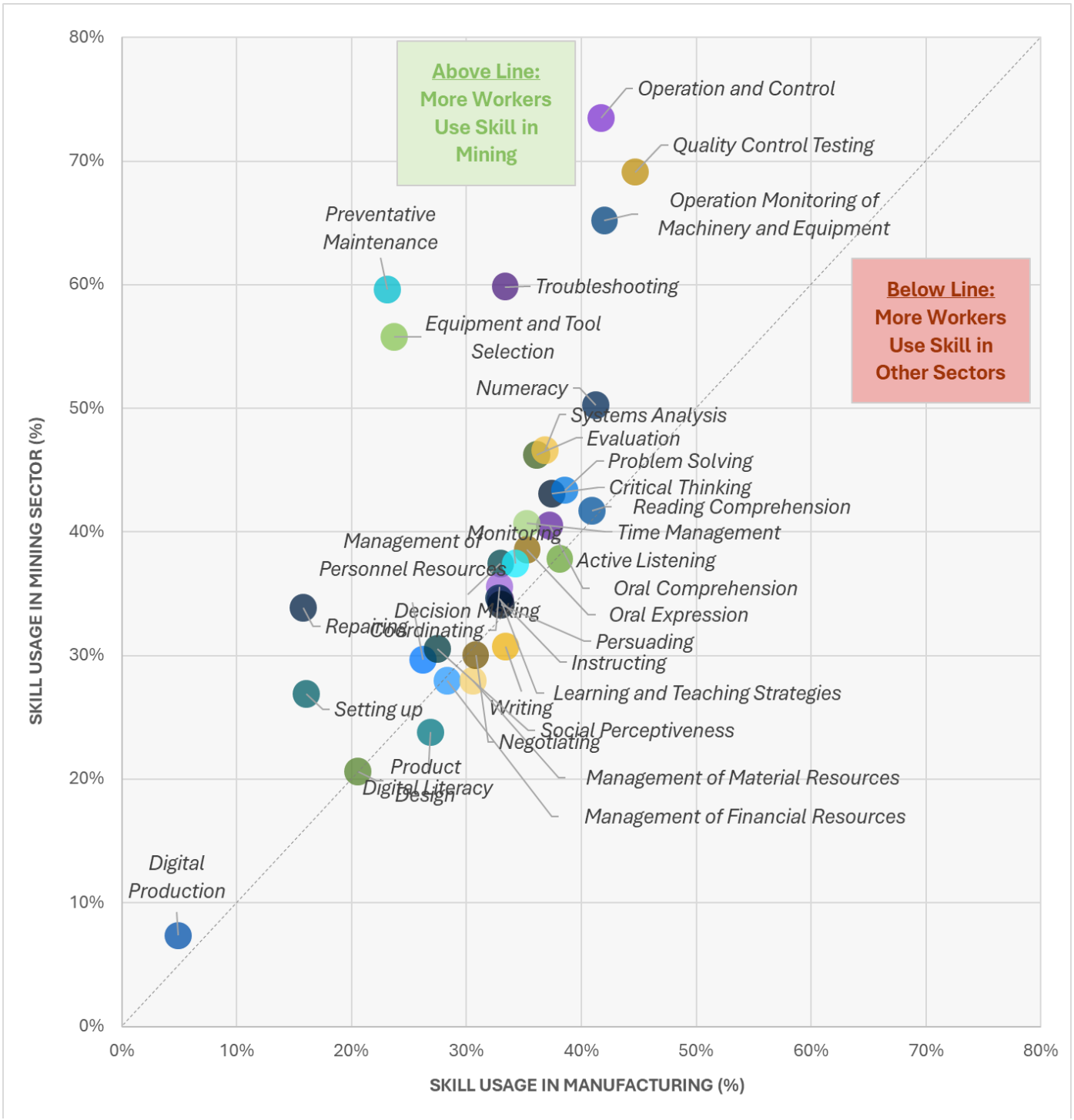
Source: Mining Industry Human Resources Council, British Columbia Labour Market Analysis, 2025; Employment and Social Development Canada, Occupational and Skills Information System (OaSIS), 2025; Statistics Canada, Census of Population, 2021.

FIGURE 6: COMPARISON OF ABILITIES PREVALENCE IN BRITISH COLUMBIA'S MINING SECTOR AND CONSTRUCTION SECTOR (2021)



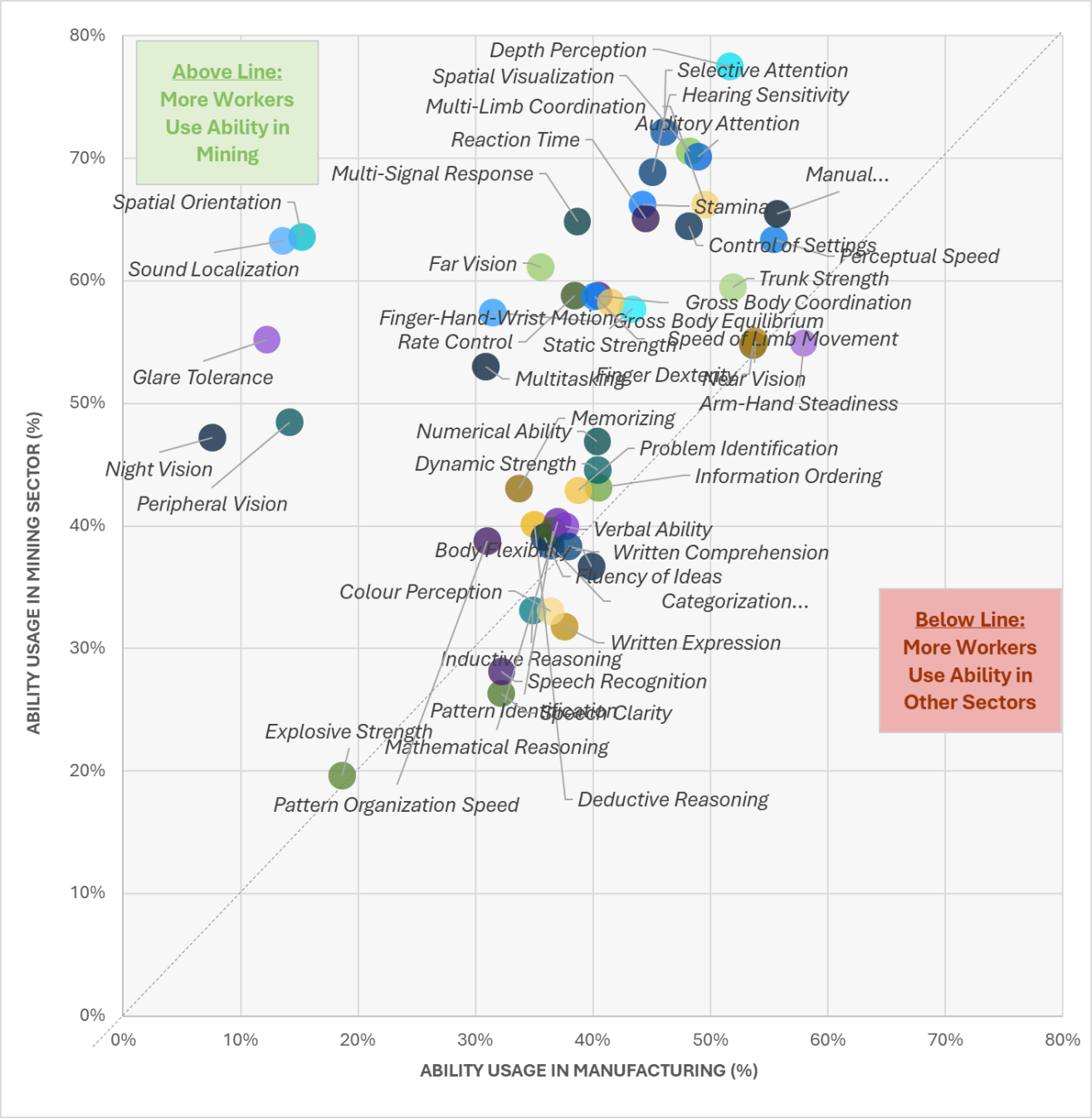
Source: Mining Industry Human Resources Council, British Columbia Labour Market Analysis, 2025; Employment and Social Development Canada, Occupational and Skills Information System (OaSIS), 2025; Statistics Canada, Census of Population, 2021.

FIGURE 7: COMPARISON OF SKILLS PREVALENCE IN BRITISH COLUMBIA'S MINING SECTOR AND MANUFACTURING SECTOR (2021)



Source: Mining Industry Human Resources Council, British Columbia Labour Market Analysis, 2025; Employment and Social Development Canada, Occupational and Skills Information System (OaSIS), 2025; Statistics Canada, Census of Population, 2021.

FIGURE 8: COMPARISON OF ABILITIES PREVALENCE IN BRITISH COLUMBIA'S MINING SECTOR AND MANUFACTURING SECTOR (2021)



Source: Mining Industry Human Resources Council, British Columbia Labour Market Analysis, 2025; Employment and Social Development Canada, Occupational and Skills Information System (OaSIS), 2025; Statistics Canada, Census of Population, 2021.