MINING INDUSTRY HUMAN RESOURCES COUNCIL

2013

Cochrane and Timiskaming Mining Hiring Requirements Forecasts

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Research was conducted in partnership with and funded in part by contributions from the Far Northeast Training Board (FNETB).

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The views expressed in this document do not necessarily reflect those of Employment Ontario.

This work is the result of an unprecedented partnership among six workforce planning boards in Northern Ontario.

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- Goldcorp Inc.
- Xstrata Copper
- Moose Cree First Nation
- Kirkland Lake Gold Inc.
- Queenston Mining Inc.
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Executive Summary

Resource-based industries are a vital part of a strong Northern Ontario economy. The discovery of significant mineral deposits in the Ring of Fire, an area in Ontario's Far North, presents major development opportunities in mining that will contribute to the Ontario economy. Development of the mineral deposits in the Ring of Fire area will create jobs and better position the Northern Ontario economy for future sustained growth.

However, human resources challenges threaten this growth potential. Labour market pressures vary considerably among the provinces and territories in Canada — reflecting differences in commodities, the mix of exploration and mining activities, and the size of the labour pool. Research by the Mining Industry Human Resources Council (MiHR) has demonstrated that regional analysis of the mining labour market is very valuable; it provides important intelligence about local industry conditions, labour market pressures, and predictions of future needs.

This report was prepared for the Far North East Training Board and deals with the geographic regions of Timiskaming and Cochrane. Developed from a provincial forecast for Ontario, the forecast presented here was customized to capture the unique conditions and context of mining in the Timiskaming and Cochrane Districts. This is one of six separate reports on districts across Northern Ontario — the other five include: Kenora and Rainy River; Sudbury; Nipissing; Algoma; and Thunder Bay. The goal is to empower these districts and others across Ontario to create effective labour market and workforce planning strategies — based on an understanding of mining operations and challenges specific to their region.

The Cochrane and Timiskaming Districts' major centres include two of the oldest mining towns in Ontario — Timmins and Kirkland Lake. Historically this area has been a hub of gold mining and with increases in gold prices, there has been resurgence in exploration activity in the area, opening doors for future economic development. This new expansion is also indicating new demand for skilled and trained labour force. Similar to other districts in Northern Ontario, the Cochrane and Timiskaming Districts' labour markets are already facing demographic shifts. Nineteen percent of the Cochrane District population and twenty five percent of the Timiskaming District population are over the age of 60. Low populations growth rates, an aging workforce and youth out migration pose a challenge for regional mining employers to find skilled and trained workers locally. Employers in the area are increasingly using fly in and fly out or commuter workforces for short term solutions to hiring needs. However these workers do not contribute in the long run to the local labour force. A combination of solutions with an aim to encourage workers to settle and live in the area will be needed to address the skills and labour shortages over the long term.

MiHR research indicates employment in the mining sector is more cyclical than in many other industries in Canada.[1] Previous labour market forecasts produced by MiHR show that despite this cyclical nature, future hiring requirements will be quite significant across Canada, even under contractionary (i.e., poor economic outlook) scenarios. These same trends are evident in the labour market forecast for the Timiskaming and Cochrane Districts.

This report uses MiHR's labour market forecasting system, which was developed to produce forecasts of employment and hiring requirements in the mining industry at the national and provincial /territorial levels.[2] This model uses a variety of factors to predict changes in employment in the mineral exploration and mining industry, including commodity prices and other economic indicators, productivity factors and demographic data. The forecasts are prepared for two-, five-, and ten-year time horizons, and are presented using three economic scenarios — contractionary, baseline and expansionary. Hiring requirements represent the sum of net change in employment and replacement requirements due to retirement and other exists from the labour force.

MiHR's provincial forecasts for Ontario were modified to produce regional forecasts for each of the six areas in question for these reports. Sub-provincial forecasting presents a number of unique challenges that do not exist in preparing forecasts at provincial and national levels. To address these challenges in its methodology, MiHR adapted a number of provincial assumptions to produce district-specific data. Adaptation was based on the outcomes of surveys; key informant interviews conducted as part of this research; and information from each planning board's own research and data collection activities within the district[3].

1 Canadian Mining Industry Employment and Hiring Forecasts, 2011.
http://www.mihr.ca/en/publications/resources/Employment_HiringForecasts2011_FINALAug4_ENG.pdf

2 The development of the forecast system was supported, in part, by funding from the Government of Canada and with financial contributions and guidance from the mining and minerals exploration industry stakeholders across Canada.

3 The forecasts presented herein provide custom estimates for the region, based on current information available at the time of production.

Table 1a shows forecasted hiring requirements for the Cochrane District's mining industry and Table 1b shows forecasted hiring requirements for the Timiskaming District. MiHR defines the industry as including all phases of the mining cycle from prospecting and exploration, advanced development and construction, support services for exploration and mining, extraction, mineral processing, and closure, care and maintenance. Forecasts are presented for three scenarios — baseline, contractionary and expansionary. Mining sector employment in the Cochrane District was estimated at almost 16,298 workers in 2012. Under the baseline scenario, the projected cumulative hiring requirements over the next 10 years will be approximately 11,870 workers. Mining sector employment in the Timiskaming District was estimated at almost 2,623 workers in 2012. Under the baseline scenario, the projected cumulative hiring requirements over the next 10 years will be approximately 1,680 workers.

Table 1a
Cumulative Hiring Requirements Forecast — Cochrane By Scenario — 2022

	Net Change in Employment	Replacement Requirements		Cumulative Hiring Requirements
		Retirement	Non-Retirement Separation	
Contractionary	3,710	3,650	3,940	11,280
Baseline	4,190	3,720	4,000	11,870
Expansionary	4,700	3,810	4,070	12,540

Source: Mining Industry Human Resources Council, December 2012
(Estimates may not add perfectly due to rounding).

Table 1b
Cumulative Hiring Requirements Forecast — Timiskaming by Scenario — 2022

	Change in Employment	Replacement Requirements		Cumulative Hiring Requirements
		Retirement	Non-Retirement Separation	
Contractionary	340	600	570	1,510
Baseline	440	640	590	1,680
Expansionary	590	660	640	1,900

Source: Mining Industry Human Resources Council, December 2012
(Estimates may not add perfectly due to rounding.)

Based on discussions with stakeholders, the mining industry in the Cochrane and Timiskaming Districts is experiencing a number of potential HR issues. The present expansion in exploration and mining activities has contributed to an increased demand for skilled workers. However the ability of the local labour market to meet demands is constrained due to aging workforce, lack of interest in youth to pursue careers in mining, low participation rates among Aboriginal peoples and new immigrants. There is a need in the Cochrane and Timiskaming District to coordinate and expand initiatives to engage, educate, train and provide employment opportunities for under-represented and under-utilized segments of the labour force such as Aboriginal peoples, new immigrants and women. By tapping into these new sources of talent and by building partnerships to train and develop the local labour force, the Cochrane and Timiskaming Districts will be better positioned to meet the labour force challenges of the future.

Background and Scope

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Background and Scope

Human resources challenges are one of the greatest threats to the future competitiveness of the Canadian mining industry.[4] A number of factors contributed to these significant HR challenges, including the looming retirement of the baby-boom generation, the struggle to attract and engage younger workers, and an under-representation of diverse groups such as Aboriginal peoples, women and new Canadians. While the industry has made tremendous strides in addressing these issues, finding skilled workers is becoming more difficult, and competition continues to increase across all sectors of the Canadian economy.

Labour market pressures vary considerably among the provinces and territories — reflecting differences in commodities, the mix of exploration and mining activities, and the size of the labour pool. Research by the Mining Industry Human Resources Council (MiHR) has demonstrated that regional analysis of the mining labour market is very valuable; it provides important intelligence about local industry conditions, labour market pressures and predictions of future needs.

This report was prepared for the Far North East Training Board (FNETB) and deals with the geographic region of the Cochrane and Timiskaming Districts. Developed from a provincial forecast, the forecast presented here was customized to capture the unique conditions and context of mining in the Cochrane and Timiskaming Districts. This is one of six separate reports on districts across Northern Ontario — the result of a cutting-edge partnership between MiHR and six Northern Ontario workforce planning boards. Each report presents a regional-level outlook that follows MiHR's labour market forecasting model.

Reports have also been prepared for five other Northern Ontario regions: Sudbury, Nipissing, Kenora and Rainy River, Algoma and Thunder Bay. The goal is to empower these districts and others across Ontario to create effective labour market and workforce planning strategies — based on an understanding of mining operations and challenges specific to their region.

4 Ernst and Young, Business Risks Facing Mining and Metals, 2010.

MiHR's Labour Market Forecasting System

This report uses MiHR's labour market forecasting system, which was developed to produce forecasts of employment and hiring requirements in the mining industry at the national and provincial /territorial levels.[5] This model uses a variety of factors to predict changes in employment in the mining and minerals exploration industry, including commodity prices, productivity factors and demographic data. The forecasts are prepared for two-, five- and ten-year time horizons, and are presented using three economic scenarios (contractionary, baseline and expansionary).

The data inputs to the MiHR forecasting model include Statistics Canada data (including, but not limited to, Census and Labour Force Survey), inputs on several economic indicators, and Natural Resources Canada data. This was supplemented and adjusted using primary research sources — region-specific inputs, mining sector employer surveys, focus groups, and key informant interviews. A general description of the forecast methodology can be found in Appendix A, along with an explanation of the underlying assumptions used to generate the Cochrane and Timiskaming hiring requirements forecasts.

Sub-provincial forecasting presents a number of unique challenges that do not exist in preparing forecasts at provincial and national levels. These include limited access to data from traditional Labour Market Information (LMI) data sources; high labour mobility; and the fact that workers may live outside the region in which they work (and vice-versa). To address these challenges in its methodology, MiHR adapted a number of provincial assumptions to produce district-specific data. Adaptation was based on the outcomes of surveys; key informant interviews conducted as part of this research; and information from each planning board's own research and data collection activities within the districts[6].

Industry Definition and Scope

For the purposes of its forecasts, MiHR defines the mining industry as including all phases of the mining cycle: exploration, development, extraction, processing and reclamation. The MiHR forecasts presented here include: exploration, mining and quarrying; support services and contractors (not including oil and gas); iron and steel mills and ferro-alloy manufacturing; alumina and aluminum; and other non-ferrous metal production and processing.

The industry is mainly defined using North American Industry Classification Codes (NAICS) and National Occupational Classification for Statistics (NOC-S) codes. Statistics Canada and other LMI sources organize their data according to these classification codes. Together, the NAICS and NOC-S systems allow MiHR to group statistics to obtain estimates of employment and workforce demographics. Details on the NAICS and NOC-S codes included in the forecasts are found in Appendix B.

5 The development of the forecast system was supported, in part, by funding from the Government of Canada and with financial contributions and guidance from the mining and minerals exploration industry stakeholders across Canada.

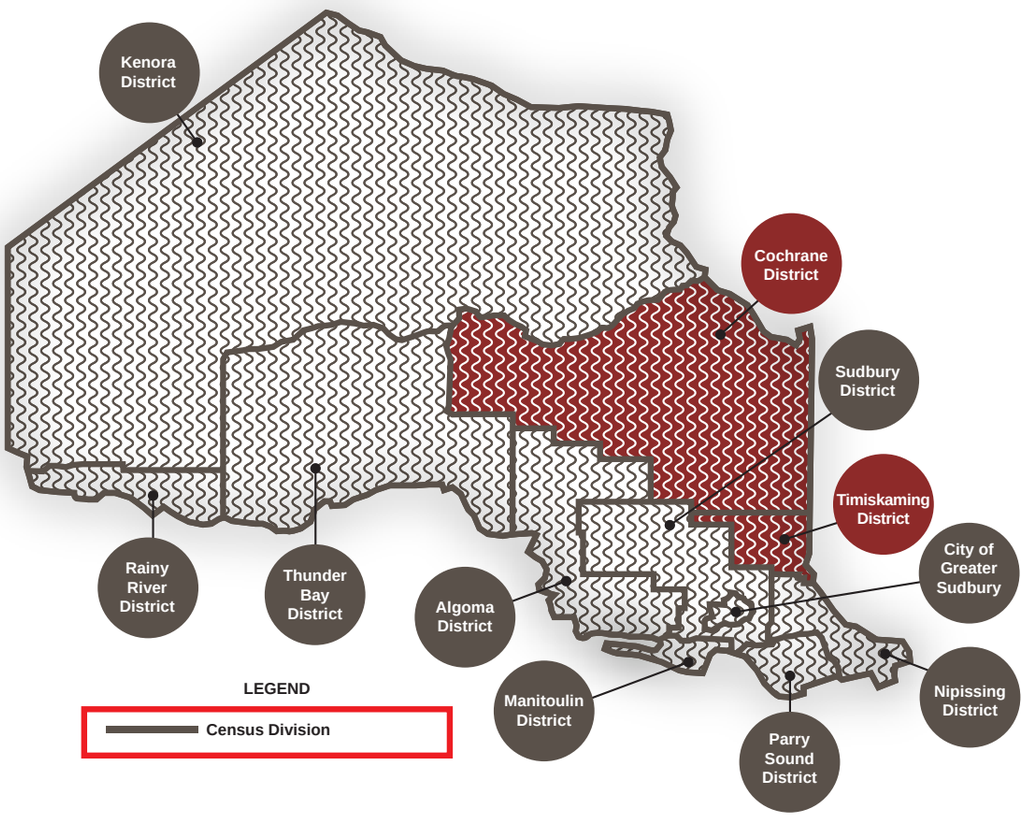
6 The forecasts presented here provide custom estimates for the region, based on current information available at the time of production.

Each district was defined according to Statistics Canada's economic districts as shown in Figure 1. Findings from primary research were used to further define local scope; set region-specific context; verify and validate data from other sources; determine the unique occupational structure of the local workforce; and provide local measurements of diversity, workforce mobility, turnover and average age at retirement. To acquire this local information, MiHR reached out to industry stakeholders in the districts through a survey on mining industry profile, labour market needs and human resources trends.

District Research

In Cochrane and Timiskaming, 27 employers[7] participated in surveys and interviews. Stakeholders included government, education, industry associations and employers in extraction, exploration and development, and in mining support-services sectors. These inputs were used to validate and adjust assumptions used in the employment modelling and forecasts for the district.

Figure 1 — Ontario Districts



7 Surveys were sent to approximately 130 extraction, exploration and development, and support services employers operating in the Cochrane and Timiskaming districts. Responses to the survey included appropriate representation of key stakeholders in the districts.

Economic Overview and Regional Labour Market

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Economic Overview and Regional Labour Market

The global economic recovery stalled due to increased uncertainty in the second half of 2011; as a result, the outlook for global growth deteriorated in the last two quarters in the year. The key factor underlying this deterioration was the ongoing euro-area sovereign debt and banking crisis. With the continued uncertainty, global exploration and mining activity slowed in 2012, casting a shadow over industry prospects for the near-term.

However, fluctuations are a reality in the mining industry and overall — despite recent activities — the economic outlook is cautiously optimistic. In the United States, the largest single customer for Canadian output and production, the economy has shown signs of a gathering momentum for sustained growth since the fall of 2011. Consumer confidence in the U.S. increased in 2012 from the near-record lows of August 2011 and output growth accelerated in both the U.S. manufacturing and non-manufacturing sectors. In addition, demand for Canadian commodities continues to grow as China, India, Brazil and other nations further develop their economies.

Canadian Economic Overview

Canadian exploration activity slackened in 2012 and industry information indicates that exploration expenditures did not meet anticipated levels during the second half of the year. As a result, the exploration and mining sector operated under a blanket of caution in the latter part of 2012. Nonetheless, Canada's economic outlook remains positive amid continued international uncertainty and a tenuous global recovery. Canadian economic growth is forecast to be modest in the near term and then to gradually and moderately increase over the forecast horizon, as demand for Canada's natural resources continues.

Canada's Recent Economic Performance

Canada's economic performance over the 2008-09 recession and throughout the recovery period has been strong relative to peer countries. This strength reflects Canada's sound economic, fiscal and financial-sector fundamentals, along with the support provided under the federal economic-stimulus package. As a result, Canada's real GDP is well above pre-recession levels — the best economic performance in the G-7 countries.

Canada posted the strongest growth in employment in the G-7 during the recovery period — with both the quantity and quality of new employment exceeding expectations. Overall, Canada has regained the ground in employment lost during the recent recession. About 90 per cent of the added jobs were in full-time positions, with over three-quarters in high-wage industries in the private sector. As of mid-year 2012, Canadian businesses are continuing to hire even though the federal government's temporary economic-stimulus program had ended.

In an October 2012 update of Canada's fiscal and economic outlook, the federal government predicted that real GDP growth in 2013 would be lower than private sector forecasters had projected in early 2012.

The largest impact in Canada of the global economic turbulence has been lower commodity prices. The European crisis and its impact on growing economies, including China, remains a drag on world economies. In North America, however, both Canadian and U.S. governments have indicated they will act as needed to provide stimulus to help sustain recovery. This is a clear message to other countries and to industry to continue to invest in North American economies. In early 2012, investment in Canada was well above pre-recession levels, at an annualized rate of 9.4 per cent.

Mining Industry Economic Overview and Outlook

In sync with other industrial sectors in the economy, the Canadian mining sector's GDP rebounded in 2010 after 2009's unprecedented and precipitous decline — increasing by 15 per cent over the levels of the previous year. The sector responded quickly to international demand with strong exports in 2010.

Globalization of international trade and rebounding demand for Canada's mineral resources have stimulated the industry's recovery; however, in mid-2011, the uncertainties associated with weak markets returned due to a number of developments, including a slowdown the U.S. economy and higher than anticipated inflation in China. These trends and others produced a temporary shock to demand for Canadian metals and minerals and resulted in much lower prices.

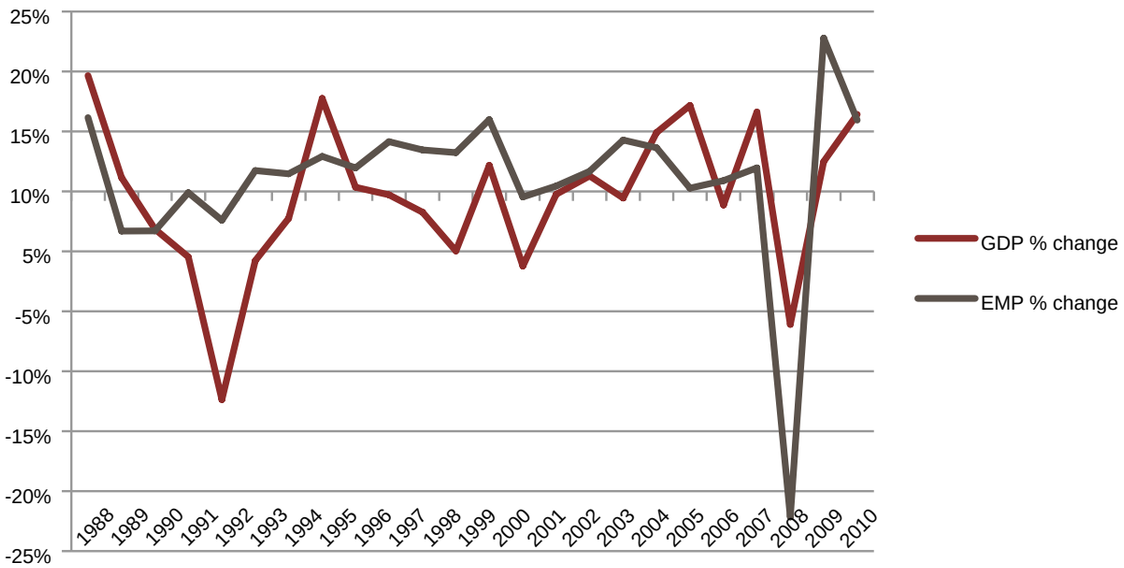
Despite the sector's cyclical nature, demand for Canadian metals and minerals is expected to grow in the long term. This prediction arises from gradual but stable economic growth in the U.S. and from the relatively high economic growth rates of China, India and Brazil. These countries' large domestic markets for Canadian exports of base metals, potash and potassium compounds, and coal bode well for additional incremental demand for Canadian metals and minerals in the near term, as well.

Canadian Mining Industry Employment

The mining industry directly employs over 235,000 people in Canada. Employment in the sector reflects a net increase of 15 per cent during the last six years, or an average increase of 2.5 per cent year-over-year, between 2004 and 2010.

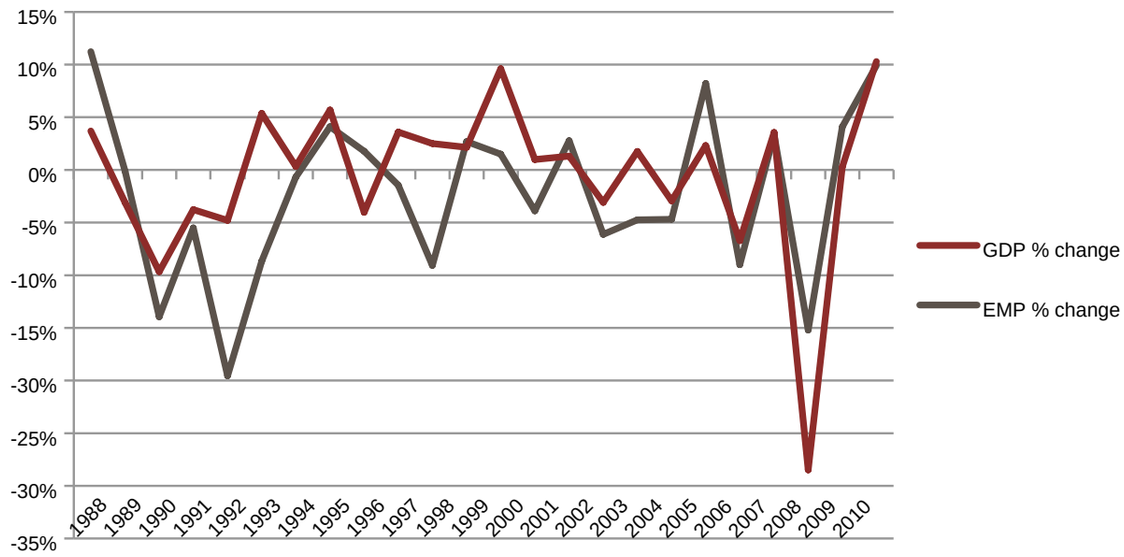
Canadian mining industry employment is sensitive to changes in GDP. Figures 2 and 3 depict this relationship in Canada and in Ontario.

Figure 2 — Employment and GDP Mining — Canada



Source: Mining Industry Human Resources Council

Figure 3 – Employment and GDP Mining - Ontario



Source: Mining Industry Human Resources Council

The Northern Ontario Mining Industry and the Ring of Fire

Resource-based industries are a vital part of a strong Northern Ontario economy. The discovery of significant mineral deposits in the Ring of Fire, an area in Ontario's Far North, presents major development opportunities in mining that will contribute to the Ontario economy. Development of the mineral deposits in the Ring of Fire area will create jobs and better position the Northern Ontario economy for future sustained growth. According to recent feasibility and impact studies, the mine developments currently under consideration in the Ring of Fire are expected to create more than 1,500 permanent jobs, once the mines are in full production. In addition, related jobs will be created in the mining service and supply sector.

Regional Labour Market

The Cochrane and Timiskaming Districts' major centres include two of the oldest mining towns in Ontario, Timmins and Kirkland Lake — the latter known as a gold mining town. The resurgence of new exploration projects and rising gold prices signal positive economic development prospects for the districts. Mining industry demand for skilled workers will be competitive in the region, where on average, 6 percent of the workforce is engaged in the mining and oil and gas sectors.

The demographics of the districts are characterized by an older workforce — 19 percent of the Cochrane population and 25 percent of the Timiskaming population are over the age of 60. This factor, coupled with out-migration of younger workers, makes it challenging for regional mining employers to fill hiring requirements. Between 2005 and 2010, the districts experienced a net out-migration of 4,646 people — almost 50 per cent (2,317) were from the 18 to 24 age group; the workforce cohort with the greatest potential to contribute to the region's economic development. The changing demographics in the region are further strained by a shrinking population (as shown in the 2011 Census) and a higher median age, relative to the Ontario average. The population declines along with the high levels of youth out-migration continue to cause supply-side pressures in the labour market.

Cochrane and Timiskaming Worker Demand

The Cochrane and Timiskaming Districts face an impending shortage of skilled workers, primarily due to a lack of younger entrants with appropriate skills coming into the labour market. The intra- and inter-industry competition for skilled workers within this region, as well as in other parts of Northern Ontario is creating recruitment and retention challenges.

Various initiatives could help alleviate the region's current scarcity of skilled workers. These include matching individual students/graduates to specific employers and aligning industry needs to academic curriculum for sectors that require specialized training. Such strategies could also help prevent youth out-migration and provide stability.

Workers who are brought into the region to fill positions can only provide short-term solutions. Fly-in fly-out workers do not contribute in the long term to the local labour pool nor do they enhance the districts' knowledge base. A combination of solutions, with an aim to encouraging workers to settle and live in the region will be needed to address the skills shortage.

Respondents to MiHR's survey reported that on average 35 per cent of their workforce is at a high school level of education, 45 per cent have completed college education, 30 per cent have received trade certification and just under 25 per cent have a university level of education. Nearly three quarters of employers reported outsourcing at least one component of education and training for their organization, including health and safety, Common Core training, leadership and managerial, apprenticeships, and language training.

Employers in the region rely most heavily on word of mouth, online job boards, newspapers and other print media, and company websites when recruiting talent. Very few (less than 5 per cent) of employers reported using social media, radio or TV, or direct recruiting from schools to find talent.

Cochrane and Timiskaming Projected Mining Activity Growth

Between 2006 and 2011, total employment in Cochrane and Timiskaming in all sectors increased by 3,700. Large losses of manufacturing jobs in the goods-producing sector were countered by employment gains in forestry, fishing, mining and the oil and gas sectors. Employment in these natural resource sectors increased by 1,100 or 6.2 per cent. These gains would have produced associated gains in the construction and professional, scientific and technical services that support mining activity. According to the industry stakeholders who responded to the MiHR survey, this upward trend will continue in the districts.

Regional respondents to MiHR's survey questionnaire indicated that employment in mining exploration, development and support activities will likely increase in the region beginning in 2013. Nearly three-quarters of employers reported business conditions as favourable and expected conditions to remain the same or improve in the year ahead. Most employers have a workforce planning horizon of about 3-6 months and react quickly (within 6 months) to economic conditions. The challenge will be to proactively find enough skilled workers to support employment expansion, given the district's current demographics and education levels.

Respondents indicated that approximately 55 per cent of their non-Aboriginal workforce live in the region, with some employers reporting as much as 100 per cent local workforces and others reporting as few as 30 per cent. Workers mainly commute into the region from Ontario and Quebec, with some employers reporting as much as one third of their workforce commuting from Saskatchewan or New Brunswick. Turnover or churn was reported at about 12 per cent for employers, but ranged between less than 1 per cent to as much as 75 per cent, depending on the employer's activities and operating context.

Cochrane and Timiskaming Potential to Employ Aboriginal Peoples and Other Diverse Groups

In Cochrane, Aboriginal communities represent 12 per cent of the population and in Timiskaming, they represent 6 per cent of the population. Responses to MiHR's survey showed that nearly 5 per cent of mining workforces are Aboriginal peoples; with a range of less than 5 per cent to as much as 20 per cent. Note that these are averages from a sample of employers and not all employers responded to this question—it is assumed that participation could be much higher in individual companies, particularly those with partnership agreements with local communities. Many of the Aboriginal people employed in the industry are in entry level, trades and production occupations. Stakeholders from industry, education, and communities expressed an opportunity for local employers to continue and increase collaboration with Aboriginal communities to expand the limited skilled labour pool.

Other demographic characteristics of the survey respondents' workforces are similar to the national patterns observed for mining. About 14 per cent of respondents' workforces are female with a range of less than 5 per cent to as much as 50 per cent. Employers reported less than 5 per cent of their workforces are new Canadians or temporary foreign workers.

Findings from MiHR's survey of employers revealed that the average age of respondents' workforces was 42 years old, with some employers reporting an average age of as much as 55. Mining sector workforces tended to be older with an average of 47; whereas exploration and support services employers reported an average age of 39. Most employers reported between 5 and 25 per cent of their workforces are eligible to retire in the next 12 months, with between 5 and 10 per cent more becoming eligible over the next 3 years, and another 5 per cent eligible in 3 to 5 years. The average age of retirement is not tracked by many respondents, but the few who do track it reported between 59 and 65 years.

Cochrane and Timiskaming Districts Hiring Requirements

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Cochrane and Timiskaming Districts Hiring Requirements

MiHR research indicates that employment in the mining sector is more cyclical than in many other industries in Canada.[8] Previous labour market forecasts produced by MiHR show that despite this cyclical nature, future hiring requirements will be quite significant across Canada, even under contractionary (i.e., poor economic outlook) scenarios. MiHR's projections for all of Canada forecast mining hiring requirements ranging from 118,600 to 196,300 workers over the next decade. Even with a very moderate outlook, MiHR's baseline scenario for the mining industry predicts the need to hire approximately 147,400 workers over the next 10 years.

Projections for Ontario mirror the national trends. The range for Ontario mining hiring projections is an estimated 51,600 to 65,800 workers. Even under a moderate hiring outlook (the baseline scenario), MiHR projects the need to hire over 59,000 workers in Ontario over the next 10 years — slightly shy of one-third of the total mining hiring requirements for all of Canada.

These same trends are evident in the labour market forecast for the Cochrane and Timiskaming Districts; even under a contractionary scenario — where total employment in the districts' mining sector increases by 17 percent — almost 12,800 workers will need to be hired to offset workforce attrition due to retirements and other separations.

Cumulative Hiring Requirements Forecast

Mining sector employment in the Cochrane and Timiskaming Districts was estimated at just over 18,900 workers in 2012. Under the baseline scenario, the projected cumulative hiring requirements over the next 10 years will be approximately 13,550 workers. The industry will need to hire 12,790 workers under a contractionary scenario and 14,440 workers under an expansionary scenario.

8 Canadian Mining Industry Employment and Hiring Forecasts: A MIWIN Report, 2011. http://www.mihr.ca/en/publications/resources/Employment_HiringForecasts2011_FINALAug4_ENG.pdf

Cochrane Hiring Requirements

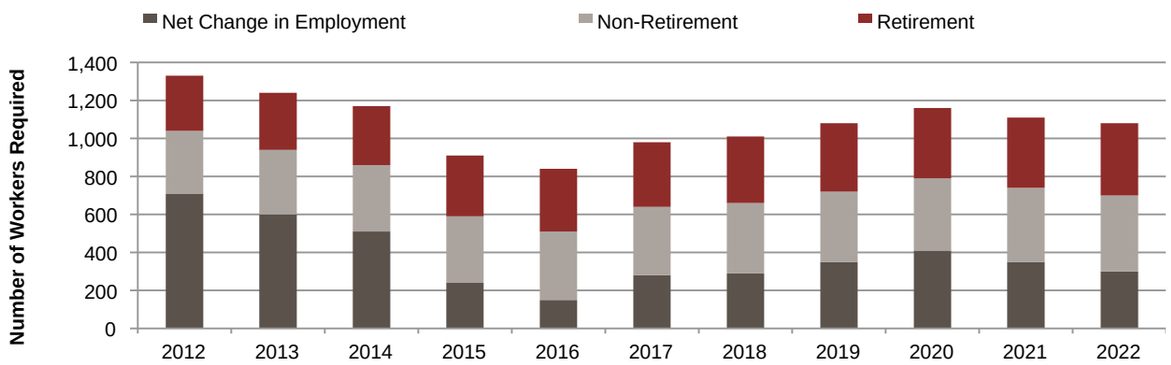
Tables 1a and 1b show forecasted hiring requirements for the Cochrane and Timiskaming Districts' mining industry under three scenarios — baseline, contractionary and expansionary. (Details on scenario development and assumptions can be found in Appendix A). Figures 4a and 4b show the hiring requirements for the Cochrane and Timiskaming Districts on a year-over-year basis, for the baseline scenario. Tables 2a and 2b summarize the cumulative hiring requirements for the Cochrane and Timiskaming Districts in 2014, 2017 and 2022, under MiHR's contractionary, baseline and expansionary scenarios.

Table 1a
Cumulative Hiring Requirements Forecast — Cochrane by Scenario — 2022

	Change in Employment	Replacement Requirements		Cumulative Hiring Requirements
		Retirement	Non-Retirement Separation	
Contractionary	3,710	3,650	3,940	11,280
Baseline	4,190	3,720	4,000	11,870
Expansionary	4,700	3,810	4,070	12,540

Source: Mining Industry Human Resources Council, December 2012
(Estimates may not add perfectly due to rounding.)

Figure 4a
Annual Hiring Requirements Forecasts — Cochrane
Baseline Scenario — 2012 to 2022



Source: Mining Industry Human Resources Council, December 2012
(Estimates may not add perfectly due to rounding.)

Table 2a
Cumulative Hiring Requirements Forecast — Cochrane by Scenario — 2014, 2017, 2022

	Cumulative Hiring Requirements		
	2014	2017	2022
Contractionary	3,580	6,010	11,280
Baseline	3,730	6,450	11,870
Expansionary	3,880	6,940	12,540

Source: Mining Industry Human Resources Council, December 2012
(Estimates may not add perfectly due to rounding.)

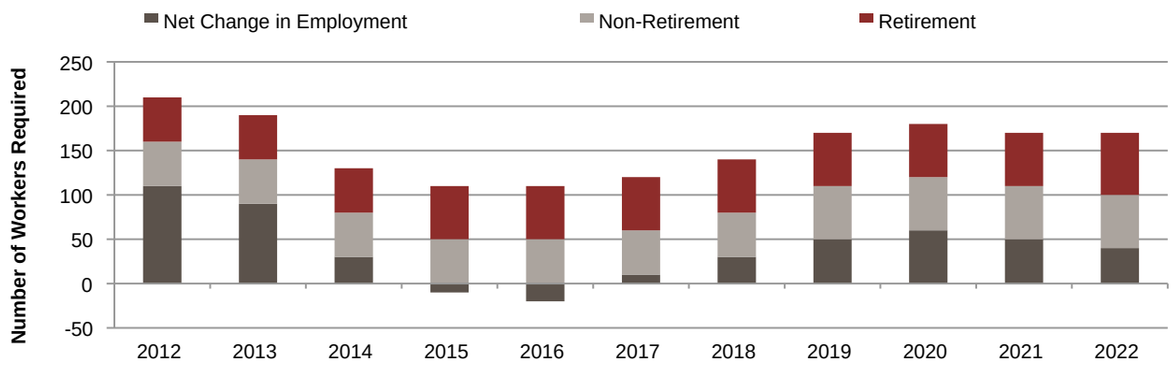
Timiskaming Hiring Requirements

Table 1b
Cumulative Hiring Requirements Forecast — Timiskaming by Scenario — 2022

	Change in Employment	Replacement Requirements		Cumulative Hiring Requirements
		Retirement	Non-Retirement Separation	
Contractionary	340	600	570	1,510
Baseline	440	640	590	1,680
Expansionary	590	660	640	1,900

Source: Mining Industry Human Resources Council, December 2012
(Estimates may not add perfectly due to rounding.)

Figure 4b
Annual Hiring Requirements Forecasts —Timiskaming Baseline Scenario — 2012 to 2022



Source: Mining Industry Human Resources Council

Table 2b
Cumulative Hiring Requirements Forecast — Timiskaming by Scenario — 2014, 2017, 2022

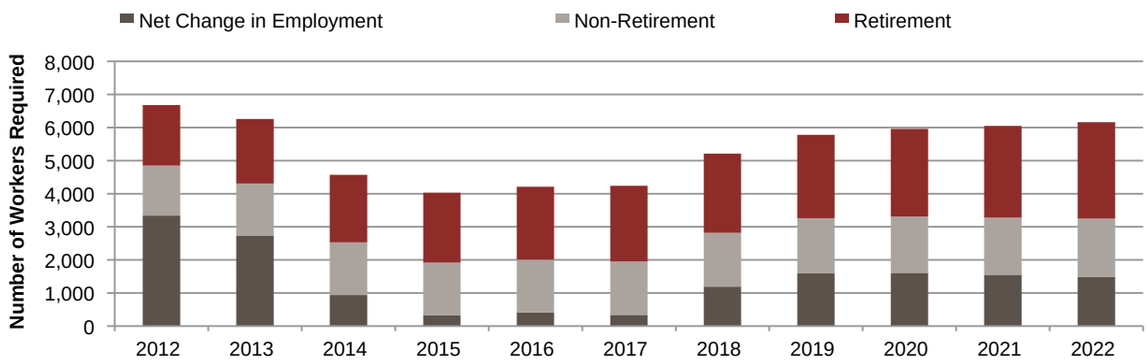
	Cumulative Hiring Requirements		
	2014	2017	2022
Contractionary	490	720	1,510
Baseline	540	850	1,680
Expansionary	590	1,010	1,900

Source: Mining Industry Human Resources Council, December 2012
(Estimates may not add perfectly due to rounding.)

Ontario Hiring Requirements

The projected hiring requirements for the Cochrane and Timiskaming Districts do not vary significantly from forecasts for the Ontario mining industry as a whole (shown in Figure 5). Ontario shows cumulative hiring requirements of approximately 59,000 workers. These requirements are driven by a combination of replacement demand and industry expansion.

Figure 5
Annual Hiring Requirements Forecasts — Ontario
Baseline Scenario — 2012 to 2022



Source: Mining Industry Human Resources Council, December 2012
(Estimates may not add perfectly due to rounding.)

Hiring Requirements Forecast By Occupation

The occupational hiring requirements for Cochrane and Timiskaming are presented in Tables 3a and 3b by broad occupational category. Occupational hiring requirements are based on the current occupational structure of the mining sector and may over- or under-estimate needs for each occupation, as new mines come online and the occupational structure of the mining workforce shifts over time. Such a shift would occur, for example, when mine development moves from the construction phase into the production phases.

The estimates in Tables 3a and 3b provide an indication of needs for training and other supports in Cochrane and Timiskaming, in particular occupational groupings.

MiHR includes 66 key occupations in its occupation-level analysis of forecasts. These occupations represent just over 70 per cent of all employees in the mining sector and are carefully selected to represent a broad spectrum of jobs that are considered unique or essential to the industry. Occupations listed in the "other" category are considered non-specific to mining; these are jobs also commonly found in other sectors (e.g., cleaning and janitorial positions, non-specific administrative roles, accountants and business analysts, nurses and other roles).

Cochrane Occupational Hiring Requirements

Table 3a
Cumulative Hiring Requirements Forecast by Occupational Category[9] — Cochrane District, by Scenario, 2014, 2017, 2022

	Cumulative Hiring Requirements		
	2014	2017	2022
Trades and Labour Occupations	1,690	2,920	5,370
Professional and Physical Science Occupations	195	330	625
Human Resources and Financial Occupations	85	145	265
Support Workers	125	225	415
Technical Occupations	135	230	440
Supervisors, Coordinators, and Foremen	280	485	895
All Other Occupations	1,220	2,115	3,860
Total	**3,730**	**6,450**	**11,870**

Source: Mining Industry Human Resources Council, January 2012

9 An occupation-specific breakdown of the needs within each category is possible. All occupation-specific data has been rounded to the nearest 5 workers.

Timiskaming Occupational Hiring Requirements

Table 3b
Cumulative Hiring Requirements Forecast by Occupational Category[10] — Timiskaming District, by Scenario, 2014, 2017, 2022

	Cumulative Hiring Requirements		
	2014	2017	2022
Trades and Labour Occupations	250	375	765
Professional and Physical Science Occupations	20	40	85
Human Resources and Financial Occupations	5	20	35
Support Workers	15	35	55
Technical Occupations	15	30	65
Supervisors, Coordinators, and Foremen	35	60	120
All Other Occupations	200	290	555
Total	**540**	**850**	**1,680**

Source: Mining Industry Human Resources Council, January 2012

These requirements can be broken down even further by individual NOC-S codes and this breakdown is shown in Table 4. It should be noted that with smaller regional-specific data sets, such as the ones used here, the error margins for an occupation-specific breakdown are high and the forecasts should be interpreted with caution. For this reason, the occupation specific breakdown is reported for both districts combined, under a baseline scenario.

10 An occupation-specific breakdown of the needs within each category is possible. All occupation-specific data has been rounded to the nearest 5 workers.

Table 4:
Occupational Breakdown of Hiring Requirements Forecast—Cochrane and Timiskaming District
Baseline Scenario—to 2022

Trades and Production Occupations	
Underground production and development miners	1,115
Labourers in mineral and metal processing	750
Construction millwrights and industrial mechanics (except textile)	710
Heavy equipment operators (except crane)	490
Industrial electricians	405
Crane operators	340
Machine operators, mineral and metal processing	320
Central control and process operators, mineral and metal processing	315
Heavy-duty equipment mechanics	290
Truck drivers	265
Material handlers	250
Welders and related machine operators	235
Underground mine service and support workers	190
Mine labourers	160
Construction trades helpers and labourers	115
Steamfitters, pipefitters and sprinkler system installers	85
Drillers and blasters — Surface mining, quarrying and construction	55
Carpenters	30
Plumbers	10
Other trades helpers and labourers	5
Total	**6,135**

Professional and Physical Science Occupations	
Geologists, geochemists and geophysicists	185
Mining engineers	150
Industrial and manufacturing engineers	95
Metallurgical and materials engineers	70
Mechanical engineers	55
Other professional occupations in physical sciences	55
Chemists	35
Electrical and electronics engineers	30
Chemical engineers	15
Civil engineers	15
Geological engineers	5
Other professional engineers, n.e.c.	0
Biologists and related scientists	0
Total	**710**

Human Resources and Financial Occupations	
Financial auditors and accountants	125
Human resources managers	55
Financial managers	55
Specialists in human resources	35
Financial and investment analysts	30
Total	**300**

Support workers	
Inspectors and testers, mineral and metal processing	145
Production clerks	85
Secretaries (except legal and medical)	75
Dispatchers and radio operators	55
Inspectors in public and environmental health and occupational health and safety	50
Administrative clerks	40
Transportation route and crew schedulers	10
Construction estimators	10
Engineering inspectors and regulatory officers	0
Cooks	0
Total	**470**

Technical Occupations	
Geological and mineral technologists and technicians	185
Chemical technologists and technicians	90
Industrial engineering and manufacturing technologists and technicians	75
Electrical and electronics engineering technologists and technicians	45
Mechanical engineering technologists and technicians	45
Drafting technologists and technicians	25
Land surveyors	25
Mapping and related technologists and technicians	5
Land survey technologists and technicians	5
Civil engineering technologists and technicians	5
Biological technologists and technicians	0
Total	**505**

Supervisors, Coordinators, and Foremen	
Supervisors, mineral and metal processing	410
Supervisors, mining and quarrying	340
Primary production managers (except agriculture)	165
Contractors and supervisors, mechanic trades	45
Engineering managers	40
Construction managers	10
Contractors and supervisors, pipefitting trades	5
Total	**1,015**

Notable Trends and Potential HR Issues

As shown by the forecasts and trends presented in this report, the mining industry in the Cochrane and Timiskaming Districts faces a number of potential HR issues. These include:

- On an occupational basis, the greatest hiring requirements for the region are in the "*trades and production occupations*." This is consistent with the requirements that MiHR has found across the country. The production and extraction phases of mining are labour-intensive and with several new mines expected to come online in the region, these positions will be difficult to fill and workers in these roles will become more mobile. Furthermore, skilled workers such as Tradespeople (Millwrights and Electricians), Heavy Equipment Operators and Truck Drivers, who are among the specific occupations in highest demand, hold highly transferable skills. This means other industries will also be trying to attract them, presenting the mining sector with stiff competition for these workers.

- The demographics and aging of the workforce indicate that the industry in the Cochrane and Timiskaming Districts will be losing a large number of their experienced workers. This could pose a significant challenge, as their replacements may lack the experience and workplace intuition that comes with many years' experience on the job. In particular, the demand for *professional and physical science* workers is expected to increase in the region. There is a higher proportion of geoscientists in the region and the geosciences workforce is older and has fewer midcareer professionals than the mining workforce. This will place increased pressures on employers to find workers with the knowledge, experience, and authority to fulfill senior roles in the sector.

- It is worth noting that the age demographics of the exploration workforce are somewhat different than those of the extraction workforce. Workers in exploration, particularly in geoscience and technician roles, tend to retire slightly older at age 62. However, there is evidence that this segment of the mining workforce lacks workers in the mid-career age categories (35-45 years). With the significant level of exploration activity in the region, this trend may add to the challenge of finding experienced geoscientists and geological technicians to meet future hiring needs. According to survey responses, the Timiskaming and Cochrane exploration and support services workforces tended to be younger, with older retirement ages than the extraction workforce.

- The category with the second-greatest hiring requirements is "*supervisors, coordinators, and foremen.*" This need is not surprising, given the outlook for the region and the mix of activities being undertaken — with many new mines projected to begin operations over the forecast period. These supervisory roles are normally occupied by employees with significant experience in the industry. The fact that a majority of these experienced workers are eligible to retire over the next decade underscores a key replacement challenge — the need to attract and retain new employees now, to provide them with the opportunity to build their depth of experience and develop the competencies for the supervisory roles they will need to assume.

- Aboriginal peoples are an important source of talent for the Cochrane and Timiskaming region. Many employers in the region have proactive strategies to engage and develop the talent potential that exists in local Aboriginal communities. Stakeholders indicated that local communities are well informed and cautiously optimistic about future employment opportunities.

- Aboriginal talent tends to be under-utilized in all sectors across Canada. In mining, Aboriginal employees are employed mainly in labour and support roles. Industry and education partnerships to provide advanced education opportunities for members of local Aboriginal communities could potentially ease the pressures that Cochrane and Timiskaming employers will experience — as they attempt to source critical talent for jobs in the physical sciences and engineering, and in technician roles.

- Women are broadly under-represented in Canadian mining (14 per cent compared to 47 per cent in the overall national labour force). Furthermore, the women employed in the industry occupy mainly administrative and clerical roles. Survey results indicated that women are comparatively under-represented in mining in the Cochrane and Timiskaming Districts. While not a Census estimate, the surveys suggested that women represent 14 per cent of the workforce on average — with employers providing a range of 5 to 20 per cent. Efforts to remove potential barriers and ensure opportunities for women in the industry will be key to meeting future hiring requirements in the districts.

- Education and training partnerships are important to the districts. Industry consultation highlighted opportunities for employers and local education institutions to further strengthen partnerships and collaborations. With increasing needs to hire over the short term in many highly skilled occupations that require extensive education and training; immediate action and proactive planning and communication among stakeholders will ensure the local workforce is ready and able to fill vacant positions in all segments of the industry.

Available Talent—Ontario

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Available Talent—Ontario

A natural reaction to MiHR's hiring requirements forecasts is a desire to know more about potential sources of talent to meet the projected needs. MiHR has recently developed new forecasting capabilities to project total available talent for the same 66 key mining occupations included in its hiring requirements forecasts. Currently, these talent projections have been developed at the provincial level only — largely due to challenges with reliably tracking mobility rates at a sub-provincial level.

While MiHR is not yet able to disaggregate these forecasts to a regional level, the provincial-level projections can provide an indicator of the needs of a specific region, assuming that the region will attract a portion of the talent available to the province as a whole. The numbers presented here are intended to provide insights into the gaps that the Cochrane and Timiskaming Districts can expect to face in meeting their hiring needs over the next decade. They also help to inform the recommendations at the end of this section on ways to increase the region's share of available talent, as well at potential strategies to grow the talent pool.

Forecasting Talent Availability for the Province of Ontario

MiHR's model for Available Talent includes specific occupations identified as critical to the mining industry. The model first projects the pool of labour that the mining industry is expected to draw from — for each occupation — and then predicts the proportion of that pool that the industry will successfully attract in a given year.

The share of talent that the mining industry is able to attract varies among occupations — depending on how specific an occupation is to the mining industry. For example, the mining industry has historically attracted approximately 100 per cent of underground mine service and support workers but only 3 per cent of HR specialists. The predicted share for the mining industry is based on historic patterns — reflecting mining's traditional capacity to attract and retain talent compared to all other industries drawing from the same occupation pool. Talent share is typically stable over time. As the mining industry attempts to increase its own share, it is likely that competition from other industries will intensify in response.

Available Talent for Ontario Mining

Although a number of the occupations included in the data set are specific to mining, many are not; therefore, total supply of talent was forecast by occupation across all industries. This allowed MiHR to assess the potential pool of Ontario workers available to the mining industry. The analysis estimates the number of workers in each occupation that are historically attracted to employment in mining — permitting an assessment of the relative tightness of the mining labour market for each occupation.

MiHR forecasted annual supplies of workers in all industries across all 66 occupations, and estimated the mining industry's share of the talent pool based on historic trends of the flow of workers into the mining industry.

The available talent for each occupation can be reasonably estimated using predictions for new entrants into the labour market — based on migration trends, school leavers and people re-entering the labour market. This model assumes relative equilibrium in current supply. It also assumes that those already employed or seeking employment will remain in the province (not necessarily with the same employer) or be captured as exiting the labour pool in "exit" estimates. Using this stock and flow model, new entrants represent the pool of available talent to fill hiring needs over the forecast horizon.

Table 5 shows the availability of talent over a two-, five-, and ten-year horizon for the province of Ontario. According to model projections, there will be approximately 509,800 new entrants into Ontario's labour force for the selected 66 occupations. Historically, the mining industry in Ontario has attracted 3 per cent of new entrants. Assuming this rate remains constant, Ontario's mining industry can expect to attract 14,900 new entrants over the next 10 years.

Table 5
Cumulative Available Talent, Ontario — All Sectors and Mining
66 Occupations — 2014, 2017, 2022

	2014	2017	2022
Total entrants for 66 occupations, all industry sectors	137,900	277,000	509,800
Mining's share of entrants for 66 occupations (assuming the historic rate of 3 per cent)	4,000	8,000	14,900

Source: Mining Industry Human Resources Council, December 2012

Addressing the Gaps

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Addressing the Gaps

Just as the nature of talent gaps differs among occupations, so do the strategies to address the gaps. The responsibility to develop and implement these strategies does not rest with industry employers alone, but also with industry associations, community stakeholders, educational institutions and governments. By working together to support mining's ability to attract talent, stakeholders will enable a key economic sector to progress, to the benefit of Ontario's economy as a whole.

Increasing Mining's Share of Available Talent

In some cases, industry, education and government must aim to attract more entrants from an existing pool (i.e., carve out a larger slice of the talent pie); however, this is not an easy undertaking. As mining competes for more of its traditional share of the talent pool, other industries will respond with attempts to maintain or expand their own shares; the competition for talent will simply increase.

Furthermore, as the competition for talent heats up, other complications arise. For example, workers become more mobile and look for options in other sectors or other regions. In some cases, employers feel driven to offer higher salaries and increased benefits in a bid to retain talent. These strategies may result in short-term gains but quickly become unsustainable. Furthermore, such activities serve only to shuffle around the industry's current workforce, rather than draw in and engage new workers.

To address these types of gaps, the district's employers, educational institutions and governments can:

- Work together to promote careers in Ontario mining to youth, workers in other provinces and new immigrants. The participation of immigrants in the district was below 5 per cent. New Canadians tend to settle in large urban centres and many have the skills and talent needed in a growing mining sector.

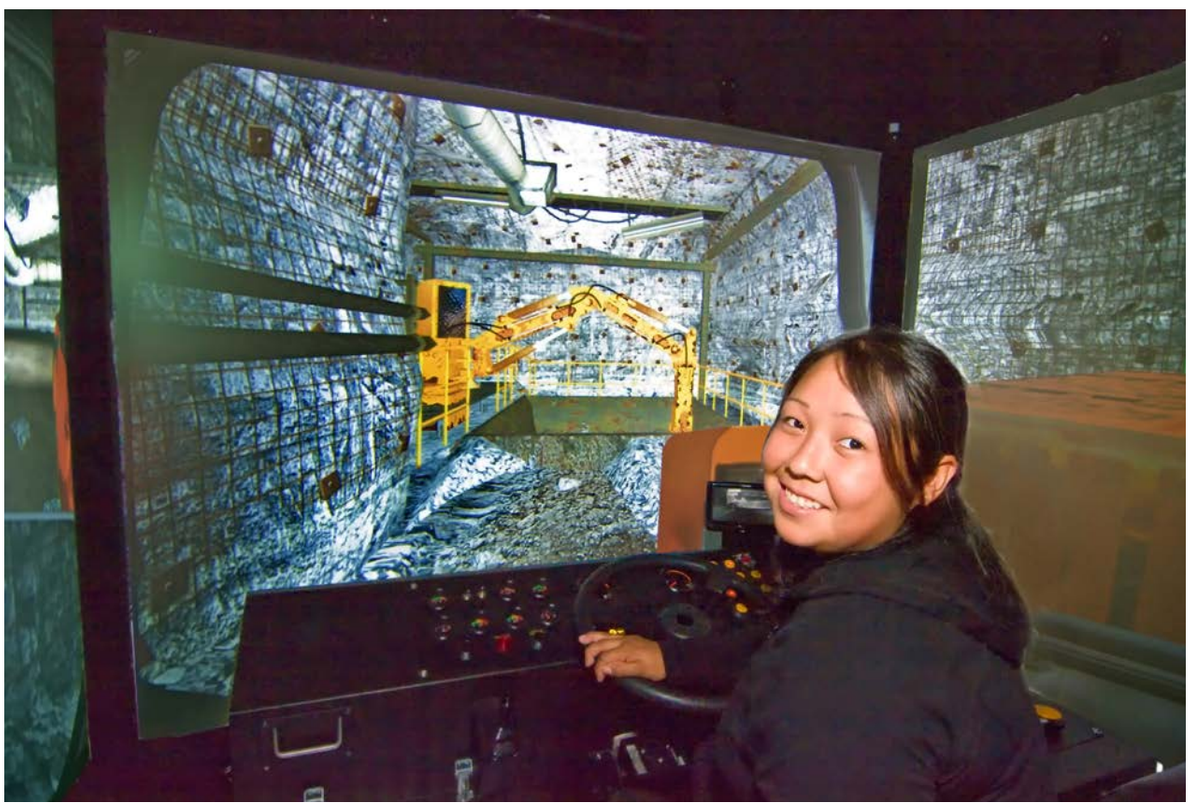
- Support the career-awareness and outreach activities of various associations, such as local planning boards. Support for career fairs, partnerships with school boards, and coordination with industry to support field trips and curriculum development activities are effective strategies for engaging youth in elementary and high school. The region can also adopt a consistent industry brand that promotes positive impressions of mining careers and dispels myths. For example, MiHR's *Explore for More* brand can be readily adapted to provincial and regional needs.

- Coordinate and expand initiatives to engage, educate, train, and provide employment opportunities for under-represented and under-utilized segments of the labour force, such as women, new Canadians and members of local Aboriginal communities. According to the survey conducted for this research, approximately 5 per cent of the mining workforce in the districts are Aboriginal, thus the districts seem to under-perform the Canadian mining industry. Furthermore, Aboriginal people tend to be mainly employed in entry level and production occupations. There are efforts in the districts to better understand the skills profiles of Aboriginal peoples and match their skills with employment opportunities. These programs will be essential to mining employers as the labour market heats up and skills shortages are realized.

- Create a community of practice to share experiences, initiatives and practices and to create synergies among regional employers in attracting new talent. For example, collaborative and cooperative hiring campaigns and career fairs could be held within Ontario and in other provinces, to inform skilled workers outside the region about the mining employment opportunities that exist within the region.

Growing the Talent Pool

In other cases, there simply aren't enough people in the talent pool to meet the mining industry's projected needs. The industry and its counterparts in education and government must strive to increase the number of entrants and grow the talent pool (i.e., make the pie bigger). These solutions are generally long-term and require coordinated and streamlined efforts among employers, government, educators and industry associations.



Targeted efforts to re-attract retirees and retain mature workers have proven to be good mitigation strategies where talent— particularly experienced talent — is not yet available. These efforts ensure that an already small labour pool does not shrink further and that experienced workers remain in the workforce to mentor younger workers and rapidly increase their future potential in the workforce.

Possible approaches to growing a talent pool include:

- Government, employers and educators could explore ways to increase flexibility in apprenticeship and skills-training programs to develop new workers at a faster rate, without compromising quality of training.

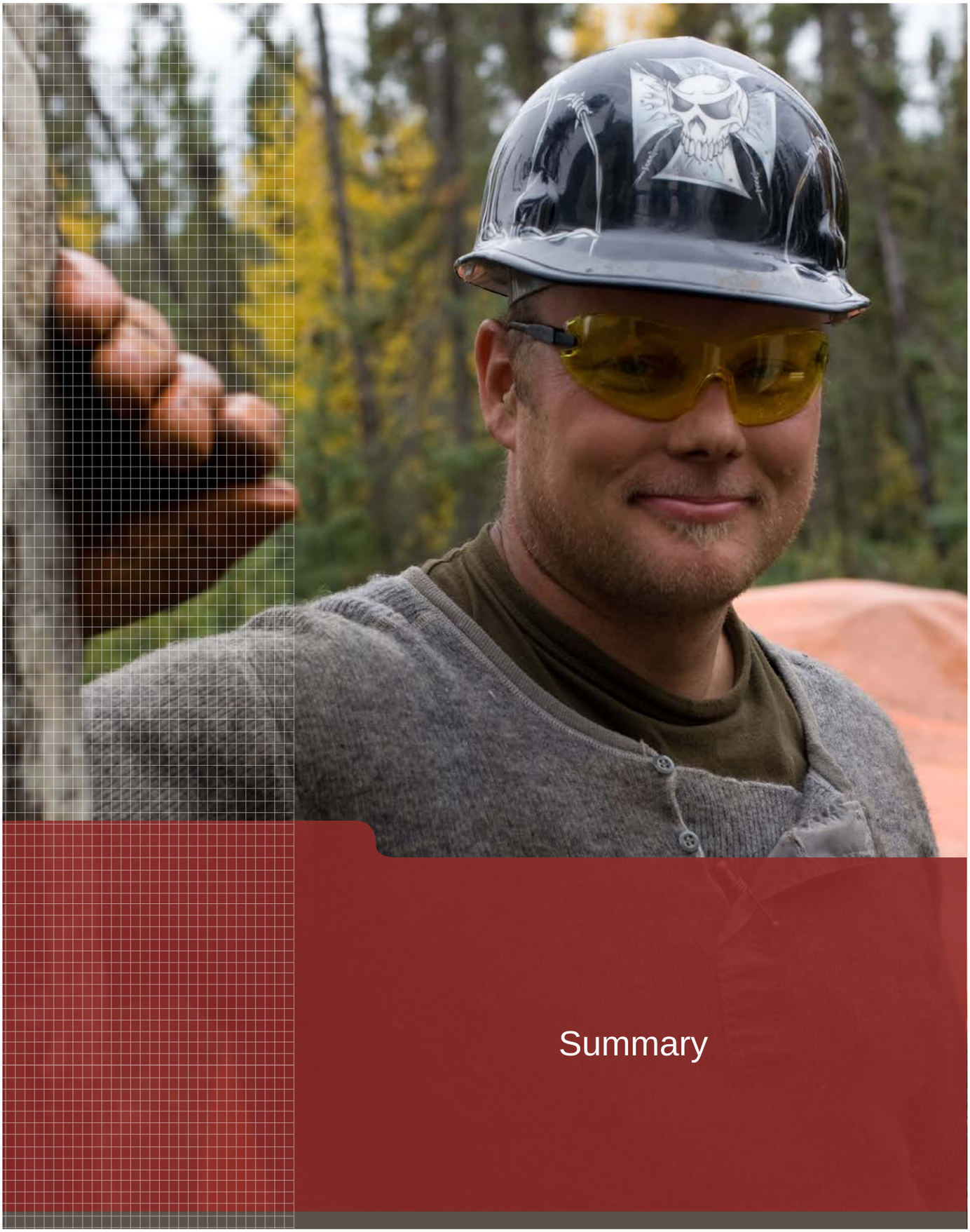
- Enhance participation and collaboration by all stakeholders— education, employer, and associations representatives — in local education task forces, planning boards and committees. The region already sees benefit from local collaboration. As the labour market tightens, the willingness to collaborate may shift as employers compete for talent.

- Coordinate industry efforts with local educational institutions to provide work-experience programs and encourage graduates to remain in the local area.

- Support participation in MiHR's Canadian Mining Certification Program (CMCP), which provides a nationally-recognized credential to experienced workers in previously unrecognized mining-specific occupations such as Underground Miner, Minerals Processing Operators, Surface Miners and Diamond Drillers/Diamond Driller Assistants. Professionalization of these occupations will contribute significantly to attracting youth and second career seekers to mining as an employment sector of choice.

- Develop a communication strategy targeted at public and separate schools to promote the mining sector as an employer of choice, working with key educators (e.g., principals, guidance counsellors and teachers) to integrate mining curriculum and programming, and expanding upon the work of the Prospectors and Developers Association of Canada's (PDAC's) *Mining Matters*.

- Support and strengthen efforts to facilitate communication between employers, in expressing needs, and education institutions, in working to address those needs. It can take years to mobilize the necessary resources and institute new training programs to graduate competent new entrants to the labour market. Employer needs are usually more immediate than what education institutions can adjust for. Longer planning horizons for employers and the close channels of communication with education institutions can help to reduce this gap.



Summary

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Summary

Mining has promising growth potential in the Cochrane and Timiskaming Districts. Historically this area has been a hub of gold mining activity and with increases in gold prices, there has been resurgence and renewal that is opening doors for future economic development. In addition, the discovery of significant mineral deposits in the Ring of Fire region, an area in Ontario's Far North, presents major development opportunities for the Districts. However, human resources challenges threaten this potential.

Similar to other districts in Northern Ontario, the Cochrane and Timiskaming Districts' labour markets are facing demographic shifts. Low populations growth rates, an aging workforce and youth out migration pose a challenge for regional mining employers to find skilled workers locally. Employers in the area are increasingly using fly in and fly out or commuter workforces for short term solutions to hiring needs. However, these workers do not contribute in the long run to the local labour force. A combination of solutions with an aim to encourage workers to settle and live in the area will be needed to address the skills and labour shortages over the long term.

This report presents forecasts of hiring requirements that project the net change in employment and replacement requirements over the next ten years under three economic scenarios. Developed from a provincial forecast for Ontario, the forecast was customized to capture the unique conditions and context of mining in the Cochrane and Timiskaming Districts. This is one of six separate reports on districts across Northern Ontario — the other five include: Kenora and Rainy River; Sudbury; Nipissing; Algoma; and Thunder Bay.

Mining sector employment in the Cochrane and Timiskaming Districts combined was estimated at just over 18,900 workers in 2012. Under the baseline scenario, the projected cumulative hiring requirements over the next 10 years will be approximately 13,550 workers—11,870 in the Cochrane District and 1,680 in the Timiskaming District. Separate projections were made for each District and further broken down into occupation level predictions. On an occupational basis, the greatest hiring requirements for the region are in the "*trades and production occupations*," followed by "*supervisors, coordinators, and foremen*"—a trend consistent with those observed elsewhere in Canada.

Stakeholders in the Districts have many promising programs, initiatives and partnerships in place to address the skills and labour shortages in the region. With the suggestions included in this report, new strategies may emerge, and existing ones gain strength. Solutions will require cooperative, collaborative, and innovative approaches to industry branding, career awareness and outreach to youth, enhanced training and education, and engaging and developing under-represented and under-utilized talent groups.

Human resources form the backbone of an industry-wide strategy for success. Managing and growing a well-skilled workforce will ensure that the Cochrane and Timiskaming Districts are positioned to ensure sustainability and success of the industry well into the future.

Appendices

Appendix A

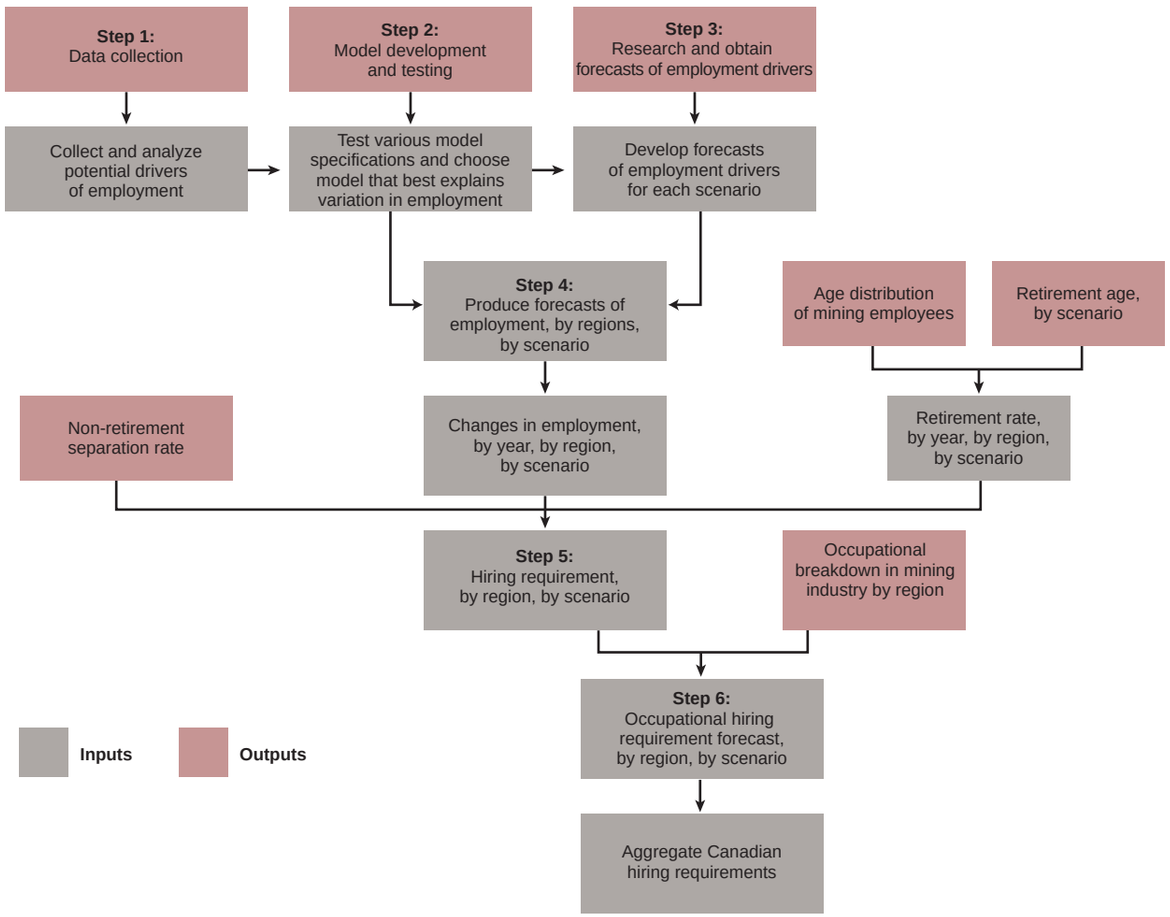
This appendix outlines the methodology used by MiHR to produce forecasts of hiring requirements in the mining industry at the national and provincial levels. A flowchart depicting this methodology is provided in Figure A1. It also describes the model specification and various data used to develop the Cochrane and Timiskaming forecasts.

Models of employment were estimated based on the following six steps:

- Step 1: Collect and analyze Statistics Canada, Labour Force Survey and other secondary data on commodity prices, labour productivity and population demographics that may potentially explain changes in the number of jobs in the region.
- Step 2: Determine the driver(s) that explain the greatest level of variation in the number of jobs by testing various model specifications through regression analysis.
- Step 3: Produce baseline, contractionary and expansionary forecasts for each driver determined in Step 2.
- Step 4: Combine Steps 2 and 3 to produce the forecasts for employment under baseline, contractionary and expansionary scenarios.
- Step 5: Produce forecasts of the total hiring requirements given the change in employment (determined in Step 4) and estimates of retirement and non-retirement separation rates.
- Step 6: Calculate and apply occupational coefficients to produce estimates of hiring requirements by occupation.
- Step 7: For the Cochrane and Timiskaming Districts, the provincial-level forecast prepared in the previous steps is adjusted, based on data inputs for the districts, including anticipated major projects expected to go into production, differences in the age structure of the population and levels of labour mobility.

Figure A1

Employment and Hiring Requirements Forecasting Model



Source: Mining Industry Human Resources Council, December 2012

Forecast Methodology

MiHR's forecasts are based on an economic model that combines a number of factors, including labour productivity, changes in commodity prices, retirement rates and non-retirement separation rates. Using a combination of independent economic forecasts and information from industry stakeholders, the model translates these factors into forecasts of mining employment and hiring requirements over a 10-year period.

The Cochrane and Timiskaming hiring requirements forecasts are the result of adjusting and partitioning the hiring requirements forecast from MiHR's provincial model for Ontario and injecting region-specific intelligence from other data sources. The provincial model was customized using data from Statistics Canada's 2011 Census, Labour Force Survey data, and data collected in the district — triangulated with data from key informant interviews and a survey of industry employers.

Labour Productivity

Labour productivity is influenced by various factors and trends that affect the level of a sector's output over time — for example, technology advancements and training can increase workers' productivity. On the whole, labour productivity has an inverse relationship with the overall level of employment. As productivity grows, the sector is able to "do more with less," which means that higher levels of productivity tend to be associated with contractions in employment needs. In the model, the Cochrane and Timiskaming Districts' mining labour productivity is assumed to be identical to the productivity forecast for the Ontario mining industry as a whole.

Minerals and Metals Prices

Mining employment in Canada tends to be more volatile than in many other sectors, making long-term workforce planning more challenging. In large part, the volatility of mining employment is a result of reactionary workforce adjustments — due to the large and sometimes unpredictable fluctuations in the prices and demand for mining commodities. MiHR research demonstrates a strong positive correlation between movements in commodity prices and the overall level of mining employment in Canada.

As a result, the model includes a consensus on minerals and metals prices for the forecast period that was custom-designed for use in the MiHR system. Authorities contributing to this consensus include the World Bank, Bank of Canada, private sector Canadian banks and commodity-specific economic analysis consultancies.

Retirement Rate

Over the next decade, the entire Canadian labour force is facing a looming wave of retirements, as members of the baby-boom generation become eligible to leave the workforce. However, it is difficult to predict the timing of retirements. The decision to retire is a complex one and each individual considers a number of factors such as financial goals, levels of debt and savings, family circumstances, health status, retirement policies and other labour market pressures. The complex nature of individual retirement decisions is an important factor when developing predictions for future retirement rates.

MiHR uses a conservative approach when estimating retirement rates. Historical retirement ages are considered and a profile of expected retirement is created based on the age demographics of the region. For this forecast, the demographics for the province of Ontario are used as a basis for the districts' age demographics, but these were adjusted, taking into account local industry inputs.

Non-Retirement Separation Rate

The non-retirement separation rate captures important movement and churn in the labour market that are not directly related to a change in the overall level of employment. This variable includes, for example, individuals leaving the mining industry in the Cochrane and Timiskaming Districts for another industry sector or for the mining industry in another region, as well as people leaving the labour force for other non-retirement reasons such as death or disability, or to return to school.

A challenge inherent to forecasting labour markets on the district level is the fact that the relatively small geographic area of a regional-level analysis dictates that workers' mobility should be considered. Workers are exceptionally mobile within a region, as compared to the provincial and national levels of analysis. They are able to live in an outside region while working in the Cochrane and Timiskaming Districts, or to easily travel from the district to other regions to work.

This makes developing a non-retirement separation rate for the region difficult and poses challenges around how workers should be counted. Should they be counted based upon where they contribute to the economy through spending and living or based on where they work and contribute through an employer's spending and investment in the region? In this forecast, individuals are counted on the basis of where they live.

These challenges are unique to the analysis of a district's labour market. As a result, MiHR has adopted conservative forecast estimates that were validated through industry consultation. In order to reflect the significantly higher labour mobility at the district level, MiHR doubled the assumed non-retirement exit rate used for the provincial forecasts —from 2 to 4 percent.

Forecast Scenarios

This report presents three forecast scenarios that adjust assumptions to illustrate a range that the hiring requirements may take over the forecast period. The baseline scenario uses a consensus forecast for commodity prices and productivity changes over the forecast period. Accounting for the consensus forecasts, the baseline scenario is the most likely path that hiring requirements will take — given the assumptions listed above and current operating environments. The expansionary scenario assumes that commodity prices are stronger than the consensus forecast (leading to increased mining activity) and that labour productivity is lower than the historic trend— providing an upper boundary for the hiring requirements forecast. Conversely, the contractionary scenario assumes commodity prices that weaker than the consensus forecast (leading to less mining activity) and labour productivity higher than the historic trend — providing a lower boundary for the hiring requirements forecast.

In addition to model inputs, information from key informants, Statistics Canada, Natural Resources Canada and MiHR research was incorporated to develop the forecast for mining employment in the districts. In particular, the baseline scenario assumes that known advanced development project will move forward as currently predicted. The model and resulting hiring requirements forecasts are deliberately conservative, taking into account the uncertainty in the economic cycle. This approach assumes that mine development may take longer than the forecast period as projects move through construction and into production phases.

Appendix B

This Appendix lists the North American Industry Classification Codes (NAICS) and National Occupational Classification for Statistics (NOC-S) codes used throughout this report to define the mining industry. MiHR is engaged in ongoing, iterative research to include more NOC-S codes in this definition of the sector and to better capture Statistics Canada data related to the mining-industry workforce.

Industry Definition and Scope

Statistics Canada, the main source of Canada's labour market information, uses two different coding systems to classify employment data: the North American Industry Classification System (NAICS) and the National Occupational Classification for Statistics (NOC-S). Both systems provide a hierarchical structure that divides higher-level categories into more detailed categories, in order to group similar establishments and individuals.

NAICS codes are used by statistical agencies throughout North America to describe economic and business activity at the industry level. The system features a production-oriented framework where assignment to a specific industry is based on primary activity, enabling it to group together establishments with similar activities.

The NOC-S system was developed by Statistics Canada and Human Resources and Skills Development Canada (HRSDC) to provide standardized descriptions of the work that Canadians perform in the labour market. NOC-S codes organize labour-force participants according to the nature of work they perform, thereby enabling similar occupations to be grouped. NOC-S codes are specific to Canada.

There is no single NAICS code that directly corresponds to all phases of the mining cycle (exploration, development, extraction, processing and reclamation). Similarly, there is no single set of NOC-S categories that pertains only to mining. People employed in occupation groups that are prevalent in mining also work in a variety of other industries. Together, the NAICS and NOC-S systems provide a means for grouping statistics to obtain estimates of employment and workforce demographics using Statistics Canada data sources. A full description of both classification systems can be found on Statistics Canada's website.

The Mining Sector

MiHR has defined the sector according to the following NAICS codes, thereby providing the best correspondence between the industry's main primary and processing activities as defined by Natural Resources Canada. The NAICS codes that define the mining industry include:

- NAICS 212: Mining and Quarrying (except Oil and Gas) — This subsector comprises establishments primarily engaged in mining, beneficiating or otherwise preparing metallic and non-metallic minerals, including coal.
- NAICS 213: Support Activities for Mining and Oil and Gas Extraction — This subsector comprises establishments primarily engaged in providing support services, on a contract or fee basis, required for the mining and quarrying of minerals and for the extraction of oil and gas. Establishments engaged in the exploration for minerals, other than oil or gas, are included

- NAICS 3311: Iron and Steel Mills and Ferro-Alloy Manufacturing — This industry group comprises establishments primarily engaged in smelting iron ore and steel scrap to produce pig iron in molten or solid form.

- NAICS 3313: Alumina and Aluminum Production and Processing — This industry group comprises establishments primarily engaged in extracting alumina.

- NAICS 3314: Non-Ferrous Metal (except Aluminum) Production and Processing — This industry group comprises establishments primarily engaged in smelting, refining, rolling, drawing, extruding and alloying non-ferrous metal (except aluminum).

- NAICS 5413: Professional sciences and consulting including geosciences, environmental engineering, geophysical surveying and mapping, assay and chemical analysis laboratories, and other surveying and mapping activities.

Occupation Classification

Listed below are the 66 NOC-S codes that MiHR uses to define the occupations that are essential to the exploration and mining sector. Note that the occupation titles listed below are those used in the Statistics Canada system. Often an occupation can have multiple titles and Statistics Canada offers a means to map or connect job titles back to the proper NOC-S code, found on the Human Resources and Skills Development Canada website (specifically the "Quick Search" box).

For example, a "Quick Search" for "Haul Truck Driver — underground mining" shows that this occupation maps directly to "Underground mine service and support workers". The site will also show which job titles are listed for each occupation category. For example "Heavy equipment operators (except crane)" includes job titles such as: apprentice heavy equipment operator; heavy-duty equipment operator; heavy equipment operator; operating engineer, heavy equipment; ripper operator — heavy equipment; shovel operator — heavy equipment; spreader operator — heavy equipment; stacker operator — heavy equipment.

NOC Code	Title
A111	Financial managers
A112	Human resources managers
A121	Engineering managers
A371	Construction managers
A381	Primary production managers (except agriculture)
B011	Financial auditors and accountants
B012	Financial and investment analysts
B021	Specialists in human resources
B211	Secretaries (except legal and medical)
B541	Administrative clerks
B573	Production clerks
B575	Dispatchers and radio operators
B576	Transportation route and crew schedulers
C012	Chemists
C013	Geologists, geochemists and geophysicists
C015	Other professional occupations in physical sciences
C021	Biologists and related scientists
C031	Civil engineers
C032	Mechanical engineers

C033	Electrical and electronics engineers
C034	Chemical engineers
C041	Industrial and manufacturing engineers
C042	Metallurgical and materials engineers
C043	Mining engineers
C044	Geological engineers
C048	Other professional engineers.
C054	Land surveyors
C111	Chemical technologists and technicians
C112	Geological and mineral technologists and technicians
C121	Biological technologists and technicians
C131	Civil engineering technologists and technicians
C132	Mechanical engineering technologists and technicians
C133	Industrial engineering and manufacturing technologists and technicians
C134	Construction estimators
C141	Electrical and electronics engineering technologists and technicians
C153	Drafting technologists and technicians
C154	Land survey technologists and technicians
C155	Mapping and related technologists and technicians
C162	Engineering inspectors and regulatory officers
C163	Inspectors in public and environmental health and occupational health and safety
G412	Cooks
H013	Contractors and supervisors, pipefitting trades
H016	Contractors and supervisors, mechanic trades
H111	Plumbers
H112	Steamfitters, pipefitters and sprinkler system installers
H121	Carpenters
H212	Industrial electricians
H326	Welders and related machine operators
H411	Construction millwrights and industrial mechanics (except textile)
H412	Heavy-duty equipment mechanics
H611	Heavy equipment operators (except crane)
H621	Crane operators
H622	Drillers and blasters —Surface mining, quarrying and construction
H711	Truck drivers
H812	Material handlers
H821	Construction trades helpers and workers
H822	Other trades helpers and workers
I121	Supervisors, mining and quarrying
I131	Underground production and development miners
I141	Underground mine service and support workers
I214	Mine workers
J011	Supervisors, mineral and metal processing
J111	Central control and process operators, mineral and metal processing
J121	Machine operators, mineral and metal processing
J125	Inspectors and testers, mineral and metal processing
J311	Workers in mineral and metal processing

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