Alamos Gold Inc.

Economic Benefits Assessment of The Young-Davidson Mine

Final Report

26 March 2020

Building a better working world

Disclaimer

Ernst & Young LLP ("EY") has been engaged by Alamos Gold Inc. ("Alamos") to assess the economic benefits of the Alamos Young-Davidson mine. In preparing this document (the "Report"), EY relied upon unaudited data and information from Alamos and publicly available data. EY did not audit or independently verify the accuracy or completeness of this information and therefore accepts no responsibility for errors, omissions, losses or damages because of any persons or entity relying on this Report for any purpose other than that for which has been prepared. Accordingly, EY expresses no opinion or other forms of assurance regarding this information and reserves the right to revise any analyses, observations or comments should additional supporting documentation become available.

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1. Executive Summary

1. Executive Summary

Alamos Gold Inc. ("Alamos") is a Canadian-based intermediate gold producer with diversified production from three operating mines in North America. This includes the Young-Davidson and Island Gold mines in northern Ontario, Canada and the Mulatos mine in Sonora state, Mexico. Additionally, the Company has a significant portfolio of development stage projects in Canada, Mexico, Turkey, and the United States. Alamos employs more than 1,700 people and is committed to the highest standards of sustainable development. In 2019, Alamos extracted 494,500 ounces of gold, of which 338,400 ounces were produced in Canada.

Purpose of the Report

Ernst & Young LLP ("EY") has been engaged by Alamos to assess the economic benefits of Alamos Young-Davidson mine in Northern Ontario. In particular, the scope of this report includes the following:

- An assessment of the direct and indirect economic contributions associated with Alamos operational and capital spending in the Ontario and the local region. Contributions are measured in terms of gross spending, Gross Domestic Product ("GDP"), labour income, and full-time equivalent employment ("FTE").
- Overview of broader socioeconomic and community contributions by Alamos.

Findings of the Report

To estimate the economic benefits of Alamos Young-Davidson mine to Ontario and the local region - including Kirkland Lake, Temiskaming Shores, Matachewan, Matheson - EY carried out an economic contribution assessment using operational spending and capital expenditure data provided by Alamos, Statistics Canada Input-Output tables and multipliers, regional macroeconomic and microeconomic statistics and information, and EY's proprietary economic modeling tools, which are founded on the principles of Input-Output ("I-O") model.

The analysis of operational spending and capital investments related to the Young-Davidson mine suggests that there are substantial direct and indirect gross economic benefits related to gross spending, GDP, wages, and FTEs, as further illustrated in Table 1.

Table 1. Summary of Total Economic Contributions

Contributions	Spending ($ mn)	GDP ($ mn)	Wages ($ mn)	Person-Year FTEs
OPEX (Annual Contribution)				
Regional	24.5	17.6	69.1	817
Provincial	138.4	132.1	85.7	1012
CAPEX				
Regional	347.3	101.3	150.5	2187
Provincial	1645.9	1069.1	190.9	2755

Notes: Figures for wages, GDP and output are in millions and 2019 CAD$. The numbers are reflective of totals of direct and indirect average annual OPEX contributions for 2014-2019 and cumulative total CAPEX contributions for 2012-2019. Figures reflect total direct and indirect contributions.

Sources: Alamos data and EY calculations.

The results suggest that from 2014 to 2019, when the Alamos Gold Young-Davidson mine has been fully operational, its activities annually contributed **$138.4 million** in gross spending, **$132.1 million** towards Ontario's economy (in GDP), **$85.7 million** in labour income, and sustained **1,012 FTEs** in Ontario. At the local level, Alamos Young-Davidson activities contributed to an annual total of $24.5 million in

gross spending on suppliers, $17.6 million to the regional economy (in GDP), $69.1 million in wages and salaries, and sustained 817 FTEs.

The total contribution to the Province of Ontario associated with the capital investment of the Young-Davidson mine from 2012 to 2019 is estimated at **$1.65 billion** in gross spending, **$1.07 billion** towards Ontario's economy (in GDP), **$190.9 million** in labour income, and **2,755 FTEs** in Ontario. Regionally, the capital investments generated $347.3 million in gross spending, $101.3 million to the regional economy (in GDP), $150.5 million in wages and labour income, and a total of 2,187 FTE employment.

Young-Davidson would have had a remaining life of 4 years were it not for the lower mine that is currently being developed, which has extended the life by another 9 years, and possibly beyond, depending on the success of the current exploration program. For at least 13 years, Young-Davidson will produce over 200,000 ounces of gold per year and continue to sustain approximately 1,000 FTEs in Ontario, in addition to other economic and socioeconomic benefits in the region.[1]

Socioeconomic Considerations

An important way for mining companies to build strong relationships with host communities is through contributions to socioeconomic well-being of the local residents. Alamos has a long history of offering employment opportunities to community members, supporting community development programs and purchasing from local suppliers.

Employment Benefits

Since its inception, the Young-Davidson mine has actively pursued the hiring of local residents. As of 2019, more than 90% of the Young-Davidson employees were hired from local communities, accounting for nearly 15% of total mining employment in the region. Alamos also takes on apprentices annually. In 2019, 663 workers were employed at the Young-Davidson mine; Indigenous people made up 9% of the employees. Of the Indigenous employees at Young-Davidson, 78% are from the local First Nation community.[2]

Along with the employment opportunities, the Young-Davidson mine also helps contribute towards the formation of a highly skilled mining workforce and the accumulation of human capital in the local communities. The Young-Davidson mine employs a wide range of tradespersons, such as electricians, mechanics, millwrights, blasters, bolters, truckers, carpenters, assayers, geologists, metallurgists, construction miners, engineers in training, heavy equipment operators, engineers, welders, drillers, and surveyors. Job-specific trainings are provided to supervisors, heavy equipment operators and other specialist trades and professions to ensure that they are qualified and well-prepared to perform their roles.

In addition to on-site training, Alamos offers training and education to community members, including programs in language, literacy and technical skills to help local residents acquire the qualifications for long-term employment in the mining industry.

Benefits to Local Businesses

The presence of the Young-Davidson mine has helped create revenues and economic stimulus among local businesses. Where quality and technical factors permit, Alamos has prioritized locally sourced products and services so that its operation benefits the regional economy. For instance, over the last 6 years, nearly $210 million worth of operational supplies and services were purchased from local businesses. In addition, the share of total goods and services sourced from local suppliers has increased from 15% in 2015 to 20% in 2019.

Benefits to Indigenous Communities

Alamos acknowledges that First Nation and Metis communities have constitutionally protected rights tied to their historical connections to the land. Alamos believes that Indigenous communities are entitled to fully participate and share in the benefits that are generated from

mining operations within their traditional territories.

At the Young-Davidson mine, Alamos has formal participation agreements (Impact Benefit Agreements) with the Matachewan First Nation and Temagami First Nation. The agreements help ensure a mutually beneficial relationship and outline a series of benefits including employment, business opportunities and financial participation from the mine. Additionally, Alamos actively collaborates with and seeks input from local indigenous communities on environmental issues related to improving the mine's performance in the immediate and long term.

Alamos aims to maintain strong relationships with local communities to understand local challenges and priorities and continues to make contributions to education, community festivals, health care and other cultural activities in the region.

2. Current State Overview

2.1 Mining Sector in Ontario
2.2 Business Activity of Alamos Gold Inc.

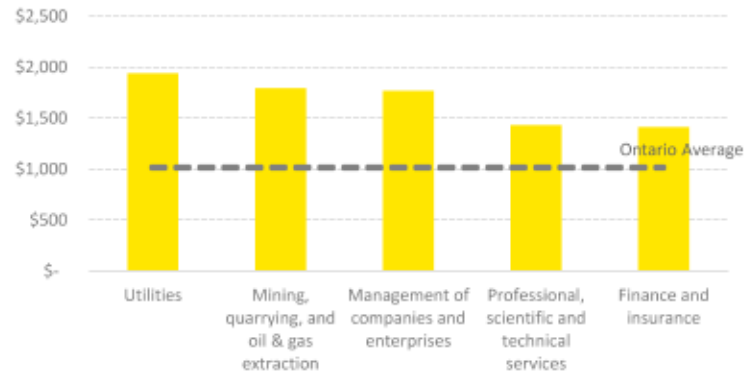
2.1. Mining Sector in Ontario

Sector Overview

Ontario's mining sector consists of both underground and surface operations, as well as processing plants and mineral exploration sites. A wide spectrum of minerals is mined in the province, including gold, copper, nickel and diamonds, among others. Mining is an important contributor to the provincial economy. In 2018 alone, approximately $10.1 billion worth of minerals were produced in the province.[3]

At the same time, the mining sector creates and supports high-paying jobs across the province. Close to 26,000 Ontarians are directly employed in the mining sector, with over 50,000 indirect jobs created through the sector's supply chains and supporting activities.[4] Mining is the second highest paying sector in Ontario after utilities. With an average weekly wage of nearly $1,800, mining workers make, on average, 75% more than average Ontario workers on a weekly basis (Figure 1). Moreover, the mining sector employs a wide array of occupations as exemplified in Table 1, ranging from underground miners, heavy equipment operators to mining supervisors and managers. Through trainings and apprenticeships, mining workers are equipped with transferrable skills that are valuable in other sectors such as utilities, manufacturing and transportation, allowing workers to switch careers between sectors more easily.[5]

Figure 1. Average Weekly Earnings in Ontario by Industry, 2018



Sources: Statistics Canada.

Table 2. Occupations in Ontario's Mining Sector

Occupation	Percentage
Underground production and development miners	17%
Supervisors, mining and quarrying	6%
Heavy equipment operators	6%
Transport truck drivers	3%
Managers in natural resources production	3%
Industrial electricians	3%
Heavy-duty equipment mechanics	2%
Geological and mineral technologists and technicians	2%
Geoscientists	2%
Other occupations	56%
Total	**100%**

Sources: Statistics Canada.

While mineral exploration and deposit appraisal activities often fluctuate alongside commodity prices, the significant amount of untapped mineral potential in Ontario has been consistently attracting sizable exploration investment. According to Natural Resources Canada, nearly $7.0 billion had been spent on mineral exploration in Ontario over the last decade.[6] The continuous stream of investment on

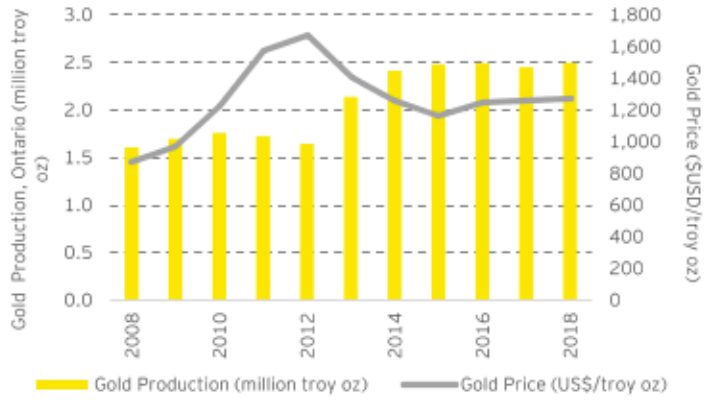
mineral exploration has been the key to sustainable development of mineral resources in the province. Additionally, the provincial economy also benefits from the capital investment made by mining companies. In 2018, for example, more than $2.2 billion were spent on mining capital in Ontario.[7]

Gold Mining in Ontario

Ontario is Canada's largest gold producer. Supported by a strong pipeline of gold project investments, gold production in Ontario has grown at a CAGR of 4.5% over the past 10 years. In 2018 alone, close to 2.5 million ounces of gold were produced in the province, accounting for 42.5% of Canadian production (Figure 2).[8] Of the 39 mines that are currently active in Ontario, 18 are gold mines.[9]

An important characteristic of Ontario's gold mines is their high concentration in the remote regions. These mines and their production are expected to have created or sustained major employment opportunities. In addition to local job creation, mining companies often offer on the job training, skills and education opportunities and contribute to social and infrastructure investments within the local communities.

Figure 2. Ontario Gold Production and World Gold Price, 2008-18



Sources: Natural Resources Canada and Bloomberg.

2.2. Business Activity of Alamos Gold Inc.

Business Overview

Alamos Gold Inc. ("Alamos") is a Canadian-based intermediate gold producer with diversified production from three operating mines in North America. This includes the Young-Davidson and Island Gold mines in northern Ontario, Canada and the Mulatos mine in Sonora state, Mexico. Additionally, the Company has a significant portfolio of development stage projects in Canada, Mexico, Turkey, and the United States. Alamos employs more than 1,700 people and is committed to the highest standards of sustainable development. In 2019, Alamos extracted 494,500 ounces of gold, of which 338,400 ounces were produced in Canada.[10]

Figure 3. Alamos Properties

Sources: Alamos.

The Young-Davidson Mine

The Young-Davidson mine is located 60 kilometers west of the town of Kirkland Lake. The mine claims 11,000 acres and is one of Canada's largest underground gold mines.[11] In 2019, the Young-Davidson mine sold approximately 189,000 ounces of gold, resulting in over $347 million in operating revenues.[12] It is expected that the Young-Davidson mine will have a long production life. In 2020, it was forecasted that the mine would have an estimated 13 years of remaining reserve life given the current reserves and the status of development.[13]

Table 3. Total Expenditures for the Young-Davidson Mine, 2019

	Young-Davidson
Capital Spending	131M
Operational Spending	199M
Total	**330M**

Notes: Figures are expressed in millions and 2019 CAD$.
Sources: Alamos data and EY calculations.

As Alamos continues to extend the life and efficiency of the Young-Davidson mine, approximately $131 million in capital was injected into the mine in 2019, with an additional $107 million expected to be invested in 2020.[14] A major undertaking is the expansion of the lower mine, scheduled to be complete in June 2020, which will support a 13-year reserve life. This represents an increase of an additional 9 years from the 4-year mine life of the upper mine. This investment is expected to add capacity and reduce production costs by nearly $10 per tonne of ore mined to a long-term average of $40 per tonne.[15]

A total 10,500 m of underground exploration drilling is planned at Young-Davidson in 2020. The objective of the drill program is to explore the down-dip extension of the Young-Davidson ore body, below current Mineral Resources and beyond the extent of any previous drill holes.[16]

Total operational costs for the Young-Davidson mine in 2019 were approximately $199 million, which included administrative, mining, processing and maintenance related costs.[17]

Government Benefits

Over a six-year period between 2014 and 2019, the Young-Davidson operation contributed approximately $7.2 million in property taxes and over $46.3 million in payroll taxes.

The mine is expected to pay an estimated total of over $650 million in mining and income taxes at both federal and provincial levels over its lifetime of 13 years. The mine is anticipated to generate approximately $400 million in Ontario, over the life of the reserve, including nearly $200 million in Ontario Mining Tax (OMT) and an additional $200 million in Provincial Income Taxes. With resource conversion, the mine could potentially pay up to an estimated aggregate of $1 billion in OMT and income taxes at the federal and provincial levels.

Table 4. Estimated Government Taxes, Over the Life of the Mine (13 years)

	Young-Davidson ($Million)
Ontario Mining Tax (OMT)	$200
Provincial Income Tax	$200
Federal Income Tax	$250
Total	**$650**

Notes: Estimates use Feb 24, 2020 prices of approximately CAD$2,220 per oz. Assumes gold is approximately $1,675/oz USD, exchange rate of $0.75 USD per CAD, and reserves of 13 years. Figures are expressed in CAD$ Million.

Sources: Alamos data, assumptions and calculations.

3. Economic Analysis

3.1. Methodology Overview

To assess the economic contributions generated by Alamos Gold's Young-Davidson mine, EY performed an economic contribution assessment ("ECA") using inputs from Statistics Canada, expenditure data from Alamos Gold and EY's proprietary economic modeling tools, which are founded on the principles of Input-Output ("I-O") model.

Direct, Indirect, and Induced Contributions

Economic contributions associated with the mining operation are captured through three distinct channels: direct, indirect, and induced contributions. These contributions individually, and collectively represent how Young-Davidson mine's activities ripple throughout the national economy. More specifically, we define each of these contributions as follows:

- **Direct contributions** include the economic contributions supported directly by the capital and operational spending of the Young-Davidson mine. These include, for example, spending on capital equipment or employee wages and benefits;
- **Indirect contributions** include the economic contributions from business activities supporting the operations of the Young-Davidson mine. The indirect contributions include, among other things, the contributions from suppliers' spending when purchasing goods and services from other suppliers. This could include, for example, the costs by subcontractors hired by Alamos on goods and services such as equipment and labour; and
- **Induced contributions** include the economic contributions that occur when benefited employees from the stimulated direct and indirect economic activities associated with the mining operation spend their additional wages and salaries on consumer goods and services. The induced activities are assumed to be primarily in service or consumer-related industries, such as retail, transportation, accommodation, food and beverage services and banking and finance. This consumer spending circulates in the economy and, in turn, results in additional jobs and salaries that are also considered part of the induced contributions. Induced contributions can be estimated based on any number of rounds or iterations of additional income resulting in increased spending, economic activity, and further additional income.

As induced contributions are often estimated based on a number of iterations of the stimulated economic activities, they may tend to overstate the size of the economic contributions, especially when the assumptions within the model do not necessarily reflect regional spending patterns. Although induced contributions are real economic contributions, they can be difficult to reasonably quantify, and their inclusion can potentially overstate the overall economic contribution of a specific event. Therefore, induced economic contributions have been excluded from consideration for this economic contribution assessment.

The I-O Economic Framework

A static I-O model has been used to assess the economic contribution of the Young-Davidson mine. The I-O model was selected based on its flexibility in providing a reliable method of assessing regional contributions. Fundamentally, the I-O model translates direct contributions into indirect and induced economic contributions, which collectively define the total economic contributions of the Young-Davidson mine. The contributions are expressed in terms of the following economic indicators:

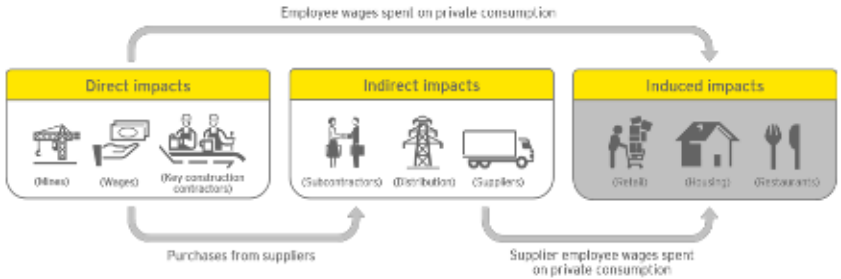
- **Gross Output:** The total economic activity of new goods and services because of activities occurring within a particular area;
- **Gross Domestic Product ("GDP"):** GDP, or local value added, is a measure of the value of all final goods and services produced in a specific region;
- **Wages or labour income:** A component of the local value-added that measures total employee compensation (value of wages and benefits) and proprietor income; and
- **Full-time equivalent employment ("Person-Year FTEs"):** This refers to the total number of employee jobs that are converted to full-time equivalence based on the average full-time hours worked.

Economic Contribution Estimation

To estimate the total economic contributions of the Young-Davidson mine in Ontario, Statistics Canada's most recent economic multipliers from 2015 are used. These multipliers reflect how the interdependency between all sectors in the economy is tracked. Specifically, each of these multipliers is a number that describes the size of the total economic impacts for a given level of spending. Statistics Canada's I-O tables are used by both public and private sector organizations and other researchers and is based on a widely accepted methodology for estimating economic impacts.

To develop regional economic multipliers for the Matachewan/ Kirkland Lake region, where the Young-Davidson mine are located, we used data and information on industry concentrations, employment levels, and other microeconomic data from Statistics Canada that reflects its local economy. More specifically, these regional data and information serves as an input to the provincial input-output table to simulate the regional economy. The economic multipliers developed using this methodology provide a more granular representation of how activities associated with the Young-Davidson mine contribute both locally and provincially.

Figure 4. Direct, Indirect and Induced Economic Contributions



Sources: EY illustration.

3.2. Economic Contribution Result

Contributions from Operational Spending

The economic analysis suggests that from 2014 to 2019, when the Alamos Gold Young-Davidson mine has been fully operational, its operational activities annually contributed **$138.4 million** in gross spending, **$132.1 million** towards Ontario's economy (in GDP), **$85.7 million** in labour income, and sustained **1,012 FTEs** in Ontario. Provincially, the mine has sustained 663 direct jobs and an additional 349 indirect employment across a range of supplier industries, generating $63.9 million in direct labour income and $21.8 million in indirect labour income. Regionally, Alamos mining activities contributed to an annual total of $24.5 million in gross spending on suppliers, $17.6 million to the regional economy (in GDP), $69.1 million in wages and salaries, and sustained 817 FTEs. A summary of direct and indirect contributions from operational spending is provided in Table 5.

Table 5. Summary of Annual Contributions from Operational Spending

Young-Davidson	Spending ($ mn)	GDP ($ mn)	Wages ($ mn)	FTEs
Regional				
Direct	21.5	16.7	63.9	663
Indirect	3.0	0.9	5.2	154
Total	24.5	17.6	69.1	817
Provincial				
Direct	105.0	103.5	63.9	663
Indirect	33.5	28.6	21.8	349
Total	138.4	132.1	85.7	1012

Notes: Figures for wages, GDP and output are in millions and 2019 CAD$. Figures represent average annual contribution for 2014-2019. Regional share of gross spending is estimated using Alamos spending on local suppliers.

Sources: Alamos data and EY calculations.

Contributions from Capital Investment

Alamos has made significant capital investments in the region to support mining development, expansion and construction activities. The total contribution to the Province of Ontario associated with the capital investment of the Young-Davidson mine from 2012 to 2019 is estimated at **$1.65 billion** in gross spending, **$1.07 billion** towards Ontario's economy (in GDP), **$190.9 million** in labour income, and **2,755 FTEs**. Provincially, the capital investments have sustained 1,815 direct jobs and an additional 940 indirect employment, generating $139.3 million in direct labour income and $51.6 million in indirect labour income. Regionally, the capital investments generated $347.3 million in gross spending, $101.3 million to the regional economy (in GDP), $150.5 million in wages, and sustained a total of 2,187 FTE employment. A summary of direct and indirect contributions from capital spending is provided in Table 6.

Table 6. Summary of Contributions from Capital Investments

Young-Davidson	Spending ($ mn)	GDP ($ mn)	Wages ($ mn)	Person-Year FTEs
Regional				
Direct	304.9	95.1	139.3	1815
Indirect	42.4	6.2	11.2	372
Total	347.3	101.3	150.5	2187
Provincial				
Direct	1237	826.1	139.3	1815
Indirect	408.9	243	51.6	940
Total	1645.9	1069.1	190.9	2755

Notes: Figures for wages, GDP and output are in millions and 2019 CAD$. Figures represent cumulative contributions for 2012-2019. Regional share of gross spending is estimated using Alamos spending on local suppliers.

Sources: Alamos data and EY calculations.

3.3. Socioeconomic Considerations

An important way for mining companies to build strong relationships with host communities is through its contribution to socioeconomic well-being of the local residents. Alamos has a long history of offering employment opportunities to community members, supporting community development programs and purchasing from local suppliers. This section outlines Alamos's efforts to generate positive returns for the communities surrounding the Young-Davidson mine.

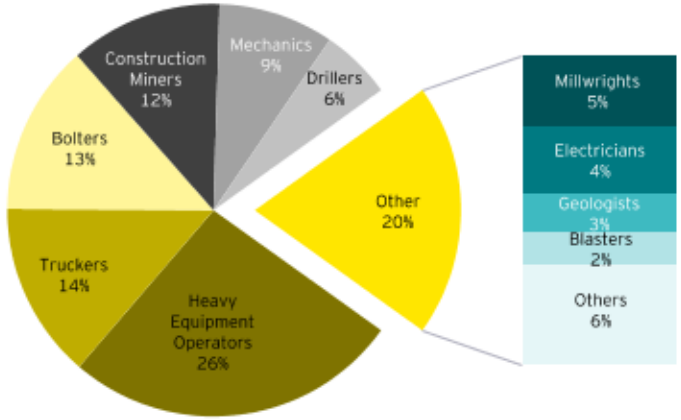
Employment Benefits

Since its inception, the Young-Davidson mine has actively pursued the hiring of local residents. As of 2019, more than 90% of the Young-Davidson employees were hired from local and Indigenous residents ("local residents" refer to Kirkland Lake and surrounding communities within a 2-hour drive), accounting for nearly 15% of total mining employment in the region.[18] Additionally, the mine hires close to 200 contractors each year. Among Young-Davidson employees, approximately 9% are from Indigenous communities, which is more than three times the industry average of 2.4% in Ontario. Of the Indigenous employees at Young-Davidson, 78% are from the local First Nation community.[19] The practice of local hiring provides quality jobs and offers competitive wages. Throughout its operation, the Young-Davidson mine has consistently offered above-average wages. For instance, in 2018, the hourly wage for entry level positions was close to $22.

Along with employment opportunities, the Young-Davidson mine also helps contribute towards the formation of a highly skilled mining workforce and the accumulation of human capital in the local communities. The Young-Davidson mine employs a wide range of tradespersons, such as electricians, mechanics, millwrights, blasters, bolters, truckers, carpenters, assayers, geologists, metallurgists, construction miners, engineers in training, heavy equipment operators, engineers, welders, drillers, and surveyors (Figure 5). Alamos provides these employees with opportunities to develop their skills and trades. As employees expand their trades, training programs, equipment and systems are implemented to ensure effective learning and skills development.

Moreover, safety training is an integral part of skills development programs at the Young-Davidson mine as part of Alamos Gold's "Home Safe Every Day" program, introduced in 2015. Depending on the employees' specific roles and job hazard ratings, training programs can

Figure 5. Skilled Trades Employed by the Young-Davidson Mine



Sources: Alamos Data and EY illustration.
Notes: "Others" include engineers in training, assayers, engineers, surveyors, metallurgists, welders and carpenters.

range from a combination of safety analysis, risk detection and broader skills development, such as rigging and fall protection, working at heights and computer-related skills. Job-specific trainings are provided to supervisors, heavy equipment operators and other specialist trades and professions to ensure that they are qualified and well-prepared to perform their roles.

In addition to on-site training, Alamos offers training and education to community members, including programs in language, literacy and technical skills to help local residents acquire the qualifications for long-term employment in the mining industry, an important measure to ensure equal opportunities for members of the Indigenous community.

Another aspect of the employment benefits generated by the Alamos operation is the jobs created and supported by the additional spending from Young-Davidson employees. As the employees spend their wages and salaries, additional jobs are induced within the local communities, particularly in consumer-related industries, such as food and beverage services, rental, transportation and accommodation services.

Benefits to Local Businesses

The presence of the Young-Davidson mine has helped create revenues and economic stimulus among local businesses. Where quality and technical factors permit, Alamos has prioritized locally sourced products and services so that its operation benefits the regional economy. Over the last 6 years, nearly $210 million worth of operational supplies and services were purchased from local businesses.[20] In addition, the share of goods and services sourced from local suppliers has increased from 15% in 2015 to 20% in 2019. More importantly, by incorporating local businesses into its supply chain, the Young-Davidson mine has contributed to the establishment of industrial clusters centered on activities related to mining in Kirkland Lake and surrounding communities.

Benefits to Indigenous Communities

Alamos acknowledges that First Nation and Metis communities have constitutionally protected rights tied to their historical connections to the land. Alamos believes that Indigenous communities are entitled to fully participate and share in the benefits that are generated from mining operations within their traditional territories.

Figure 6. Young-Davidson Suppliers in Ontario by Origin, 2019

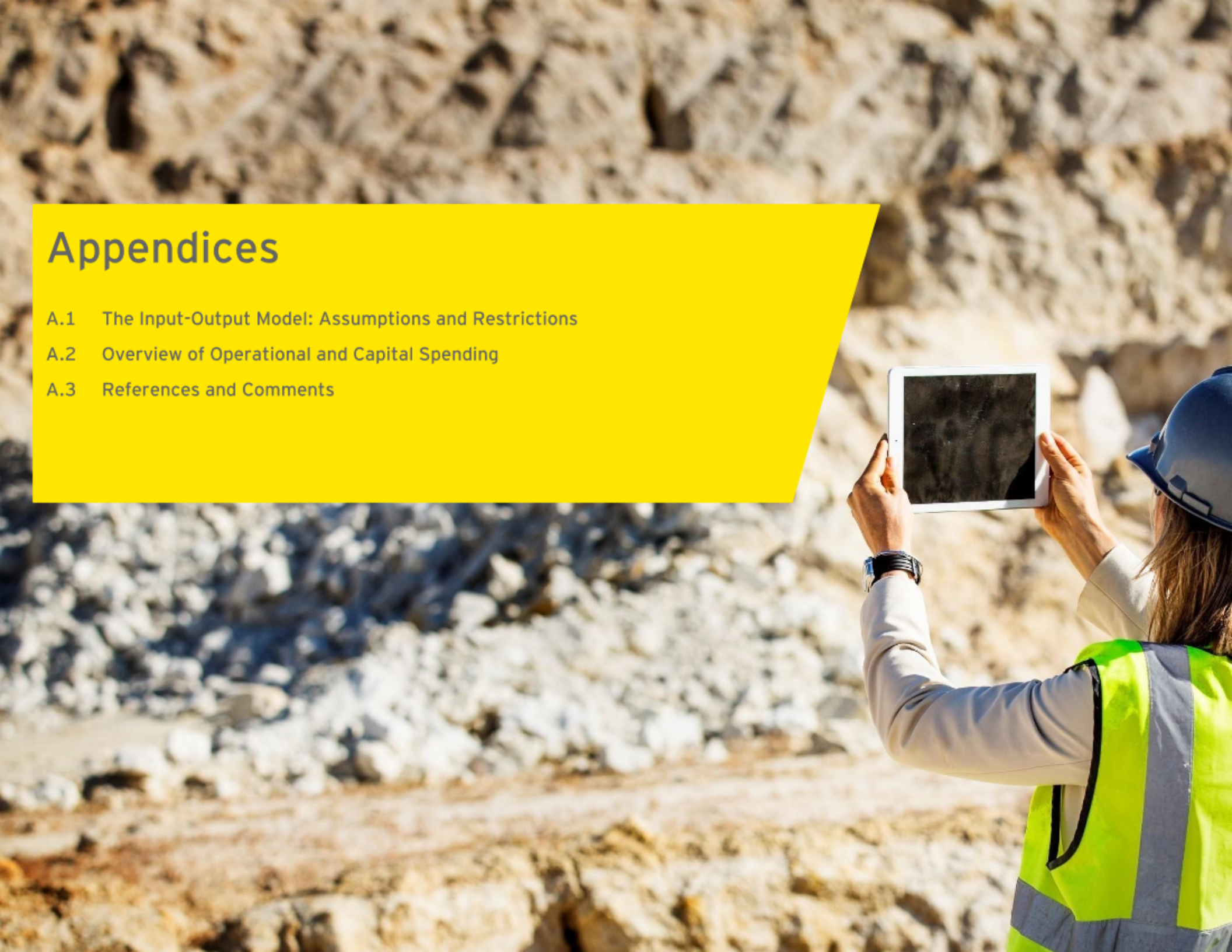
Sources: Alamos Data and EY illustration.
Notes: "Local suppliers" include those located in Kirkland Lake, Temiskaming Shores, Matachewan, Matheson
"Regional suppliers" include those located in Timmins, North Bay and Sudbury areas

At the Young-Davidson mine, Alamos has formal participation agreements (Impact Benefit Agreements) with the Matachewan First Nation and Temagami First Nation. The agreements help ensure a mutually beneficial relationship and outline a series of benefits including employment, business opportunities and financial participation from the mine. Additionally, Alamos actively collaborates with and seeks input from local indigenous communities on environmental issues related to improving the mine's performance in the immediate and long term.

Alamos aims to maintain strong relationships with local communities to understand local challenges and priorities and continues to make contributions to education, community festivals, health care and other cultural activities in the region. In 2017 and 2018, for example, the

Young-Davidson mine participated in Career Day Fairs at local schools and hosted education initiatives and site tour to support the Aboriginal Women in Mining program. Moreover, the mine sponsored Kirkland Lake's Winter Carnival and Fish Derby, an annual event that celebrates the community, as well as funded the updates to a local gym, the Matachewan Get Fit Centre.[21]

Appendices



A.1 The Input-Output Model: Assumptions and Restrictions

The following appendix outlines the assumptions and restrictions associated with the I-O model used to perform the economic impact analysis in this Report. The I-O model is subject to limitations both in concept and implementation. Like any economic model, the I-O model is conceptually an abstraction that attempts to be complex enough to accurately capture and estimate the most significant impacts to the real-life economy caused by economic activities, yet simple enough to be analytically and intuitively meaningful.

An I-O model reflects the observed interdependency between all sectors of the economy. For Canada, Statistics Canada reports for the 236 industrial sectors in the economy: (1) how each sector relies on the other 235 sectors for inputs to their production; and (2) how each sector supplies its products and services to each of the remaining 235 sectors. While an I-O model provides a consistent and innovative way of measuring the economic effects of an economic activity, one should be aware of the assumptions and limitations imposed on the model's underlying approach. Some of these assumptions include:

- The relationship between industry inputs and outputs is linear and fixed, meaning that a change in demand for the outputs of any industry will result in a proportional change in production;
- The model assumed constant returns to scale, and cannot account for economies/diseconomies of scale or structural changes in production technologies, an assumption that does not necessarily hold in the actual economy;
- Prices are fixed in the model; thus, the model is unable to account for elasticities, or more formally, how one economic variable change in response to another;
- I-O models are static, and therefore do not consider the amount of time required for changes to happen. Changing the timeframe would not affect the magnitude of the estimates;
- There are no capacity constraints, and all industries are operating at full capacity. This implies that an increase in output results in an increase in demand for labour (rather than simply re-deploying existing labour). It also implies that there is no displacement that may occur in existing industries as new projects complete;
- I-O models assume that the technology and resource mix (ratios for inputs and production) is the same for all firms within each industry, i.e., the 236 industry categories reported in Statistics Canada's input-output table. As such, our analysis describes industry average effects;
- The model assumes that the structure of the economy remains unchanged, and any structural changes in the economy since 2015 will therefore lead to changes to the multipliers, which could be implemented once Statistics Canada release updated input-output tables. As such, the further the year of analysis is away from the year of the input-output tables used, the greater the uncertainties;
- The model does not consider the economic impacts or opportunity costs associated with using resources elsewhere. In the case of this analysis for example, funds used to purchase lab equipment may be allocated to other areas. Using these funds for alternative uses would generate their own economic impacts, which could potentially be larger or smaller. However, the model will not be able to capture this difference.
- Results from the I-O model should not be interpreted as causal impacts, that is, one should not take the economic impacts

presented in this report at verbatim. We cannot say with certainty that X dollars of capital or operational spending will produce X number of FTEs or have an X amount of impact on GDP; and

- The model does not consider substitutions amongst inputs, and that each industry in the model is regarded as having a single production process.

As per the assumptions above, the structure and limitations of I-O models lend themselves to measuring the impacts of projects that are shorter term in nature; generally, they are used to look at shocks to the economy. For long term analysis, time series and general equilibrium models are more appropriate.

A.2 Overview of Operational and Capital Spending

Table 7 displays operational and capital spending associated with Alamos's YD operations. Table 8 displays the share of Alamos spending on local suppliers.

Table 7. Summary of Operational and Capital Spending

	2012	2013	2014	2015	2016	2017	2018	2019
OPEX	91.8	115.6	122.7	132.6	154.2	172.4	191.0	199.4
CAPEX	338.0	217.3	149.4	166.8	137.0	110.4	126.8	130.6
Total	429.8	332.9	272.1	299.4	291.1	282.8	317.8	330.0

Notes: Figures are in millions and constant 2019 dollars.

Sources: Alamos data and EY calculations.

Table 8. Share of spending on local suppliers

	2014	2015	2016	2017	2018	2019
Local	20%	20%	19%	21%	22%	20%

Notes: Local region includes Kirkland Lake, Temiskaming Shores, Matachewan, Matheson.

Sources: Alamos data and EY calculations.

A.3 References and Comments

[1] Alamos Gold Inc., (2020)
[2] Alamos Gold Inc., (2020)
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