Policy and Economic Analysis Program
Institute for Policy Analysis
University of Toronto
140 St. George St., Ste 325
Toronto, Ontario M5S 3G6

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Ontario Mining: A Partner in Prosperity Building -

The Economic Impacts of a 'Representative Mine' in Ontario

by

Peter Dungan and Steve Murphy

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Executive Summary

The combined direct, indirect and induced economic impacts of a representative mine are extremely large. In its 'opening' or construction phase the mine adds about **$140 million** to Ontario GDP and generates almost **2,000 jobs annually**. In its production phase, **for each year of operation**, the mine adds approximately **$280 million to Ontario GDP** and increases Ontario's employment by almost **2,300** at a rate of compensation per employee well above the provincial average.

The combined impact on government revenues is also large: In the 'opening' phase governments collect a total of **$49 million a year** from the mine's direct, indirect and induced activity, while in the production phase this rises to almost **$84 million per year**. The provincial government's share is **$19 million** in the 'opening' phase, and **over $32 million** in the production phase.

The economic impacts of a mine are in many ways like the geological nature of the mine itself: That is, the bulk of the activity is hidden below the ground and not readily visible on first glance. This study measures the economic contribution of a 'representative' mine to the Ontario economy, including not only what is easily identifiable on the surface (e.g.. number of workers directly employed, wages and salaries paid) but also delving more deeply into the indirect impacts on industries up the production chain and the induced impacts of labour income spent.

Using publicly available information from government and industry sources, the "representative" mine that we have examined produces primarily nickel and copper and is located in northern Ontario in an already serviced area such as Sudbury. 'Opening' or construction costs (once all exploration, planning and permitting is completed) are expected to average $150 million (all figures are for Canadian dollars of 2005 purchasing power) over three years while employment on the site is roughly 1,000 workers per year. When opened, the mine produces $270 million of output per year, employing 480 full-time employees. This production adds $150 million directly to Ontario GDP and total labour compensation per employee is almost $150,000 per year.

One layer below the surface of the ground is what we could characterize as the indirect impacts of the mine: These are the purchases that the mine must make in order to be built and to undertake its production (its 'inputs'), and also the purchases that the industries producing these inputs must make, in turn, to facilitate their own production ('inputs into inputs'), and so on back along the production chain. Included in these indirect impacts are the provision of transportation facilities to the mine, the purchase of a wide range of accounting, financial and scientific services, and the replacement of machinery and equipment that wears out at the mine in the course of production. Also included are all the inputs required to produce the mine's purchased inputs – for example, the replacement parts that are needed to maintain the machinery at the mine, and the steel

that goes into those parts, and the energy and transportation services needed to produce the steel. This 'backward chain' of inputs into inputs is quite extensive.

On a second level down are the induced economic impacts. These are the economic impacts that result from the spending of wages and salaries by workers employed both directly in the mine and indirectly in all of the supplier industries. To the extent that these consumer goods and services are produced in Ontario, there is a further economic impact on the province. Moreover, this level has a backward input chain to it as well, since consumer goods, or services, require their own inputs which may also be produced in Ontario and generate further wage earnings.

At a third level down we place the local or regional impacts of the representative mine. Obviously, the mine's own building or production activity is local, but so also will be at least some of the indirect and induced impacts identified at the first and second levels down. We find that a large proportion of the economic impacts of a representative mine that stay in Ontario also stay in the local area. In the **building phase approximately 1,300 of the total of 2,000 jobs annually generated are local**. In the **production phase there are 1,500 jobs created annually at the local level** out of approximately 2,300 for the province as a whole.

The fourth level down that consists of a wide network of important but effectively unquantifiable economic and social impacts that spread out from the activity of the representative mine. Most notable among these are the economic activity associated with maintaining the local community: Municipal workers, teachers, police, fire and health care. Mining companies make many direct contributions to the well-being of their communities -- for instance, in the provision of medical centers, sports facilities and community centers. In larger communities and in mining regions they support and fund universities, colleges and research facilities. Local communities also benefit from the spending of the generous pensions earned by retired mine workers and there is ongoing economic activity generated from environmental monitoring and protection and from mine rehabilitation costs. Finally, a representative mine situated in Northern Ontario makes a special contribution to the well-being and development of Aboriginal communities with targeted efforts to employ and make available entrepreneurial activities to Aboriginal workers in mining activities and to sustain and develop the surrounding communities.

The contribution of one "representative" mine in the province is clearly impressive, having important impacts on employment and economic output, particularly in an area of the province that could benefit the most from it.

Our thanks to staff and members of the Board of the Ontario Mining Association for valuable comments and suggestions. Peter McBride of the OMA, in particular, has been indispensable in providing access to a wide variety of information and in improving the report.

Ontario Mining: A Partner in Prosperity Building - The Economic Impacts of a 'Representative' Mine in Ontario

The mining industry is a crucial building block in the foundation of the Ontario economy. Just how important a part, and what role it plays, have been analyzed in a number of reports by the Ontario Mining Association – including *Ontario Mining: A High-Tech, Productivity Powerhouse* (2006).[1]

However, policy decisions do not usually revolve around the existence of an entire industry. Mining in some form will always be a part of the Ontario economy. Instead, it is the opening of a new mine or, policy action needed to maintain the production of an existing individual mine, that is usually the focus of decision-making. Should a government – federal, provincial or local – take positive steps to preserve an existing mine, or facilitate the opening of a new mine, or should it adopt attitudes of neutrality, or even consider policies that might discourage a particular mine project? These questions are the kind that typically concern mining companies and governments more than the widely-recognized value of the entire industry.

This being the case, the Ontario Mining Association felt it would be helpful to commission a study of the economic impacts of a 'representative mine' in Ontario. Such a study would characterize the annual contribution of a representative mine's production to Ontario Gross Domestic Product (GDP), employment, earnings and government revenues in order to give a better idea of the importance to the economy of policies that might support, or hinder, a particular mine.

This study, therefore, attempts to measure the economic contribution of a 'representative' mine to the Ontario economy, both in its ongoing production phase (as a period that might last as long as 20 or 30 years) and in its opening, or building phase -- the period in

[1] The authors have also previously examined the overall impact of the Mining Industry in Canada. See *Rock Solid*, a study of the impact of the Mining and Primary Metals industries on the Canadian economy from the Centre for Resource Studies at Queen's University and the Institute for Policy Analysis, University of Toronto, 1997.

which a new mine would be constructed and put into production. Once the details of a representative mine have been sketched out, the study determines the economic impact on output, employment and earnings, and also on tax revenues of the various levels of government, on an annualized basis. The study also attempts, although here it must be more cautious, to isolate what might be called the local impacts within a region of Ontario surrounding the particular representative mine.

It quickly becomes apparent that the economic impacts of a representative mine are in many ways like the geological nature of a mine itself: That is, the bulk of the activity is hidden below the ground and not readily visible at first glance. The direct economic impact of a mine is, in a sense, what one sees on the surface. These are the sales of products by the mine itself, the number of people it directly employs, the wages and salaries and profits earned in the operation of the mine itself, and of course the taxes it pays.

One layer below the surface of the ground is what we could characterize as the indirect impacts of the mine: These are the purchases that the mine must make in order to undertake its production (its 'inputs'), and also the purchases that the industries producing these inputs must make, in turn, to facilitate their production ('inputs into inputs'), and so on back along the production chain. Included in these indirect impacts are such things as the provision of transportation facilities to the mine, the purchase of a wide range of accounting, financial, insurance and scientific services, and the replacement of machinery and equipment that wears out at the mine in the course of production. Also included are all the inputs required to produce the mine's purchased inputs – for example, the replacement parts that are needed to maintain the machinery at the mine, and the steel that goes into those parts, and the energy and transportation services needed to produce the steel. In many cases, this 'backward chain' of inputs into inputs into inputs can be quite extensive. Of course, in an open economy like Ontario's many indirect inputs are imported from other countries and generate no further impact on the Ontario economy. However, we do keep track of indirect inputs imported into Ontario from other provinces and it turns out there are considerable impacts from an Ontario mine on the economic activity of the rest of Canada.

On a second level, below the indirect impacts, comes what are commonly called the induced economic impacts. Briefly, these are the economic impacts that result from the spending of wages and salaries by workers employed both directly in the mine and indirectly in all of the supplier industries. To the extent that these consumer goods and services are produced in Ontario, there is a further economic impact on the province. Moreover, this level has a backward input chain to it as well, since consumer goods or services require their own inputs which may also be produced in Ontario and generate further wage earnings.

Using information available from public reports from the Ontario Mining Association, various federal and provincial government departments and special calculations performed by Statistics Canada in its Input-Output Division, it is possible to obtain reliable calculations of the direct, indirect, and induced impacts of a representative mine in Ontario. To maintain reliability, cautious assumptions have been used where necessary in determining elements such as tax take at the various levels, or production and re-spending by consumers. In all cases, an attempt has been made to make the estimates presented in this report as reliable and conservative as possible.

With his caution in mind, the report has not been able to quantify what could be considered a final underground level to the economic impacts of a representative mine. Effectively at this level, there is a whole host of additional economic impacts that we know exist, but which occur on an irregular basis or are difficult to quantify. Examples include: Consultations with local communities, the costs associated with permitting and approvals, the provision of opportunities to Aboriginal peoples, the spending of pensions by retired miners, environmental protection and mine rehabilitation costs, and the construction of community recreation facilities and other key community infrastructure in towns where mine employees live. A section of this report will provide a more detailed list of these additional economic and social impacts of a representative mine.

This report has two main sections. The first examines the economic impacts of a representative mine when fully in production. The second examines the impacts of

building or 'opening' a mine – a process that can take several years and that generates important economic effects as well.[2] We begin with the impacts of a representative mine in production.

I. A Representative Mine – Production Impacts

A 'Representative' Mine – Surface Level

Working with the Ontario Mining Association and its members, we have come to characterize a representative mine for the purposes of this report as follows: It is a nonferrous metal ore mine producing nickel, copper and some precious metals as part of the mix. This conforms with the largest sector of the broad-based Ontario Mining industry, and also with one of the industrial sub-definitions Statistics Canada uses to characterize the mining industry and to collect and organize its data. Included in this definition of Mining is also the initial milling of the raw metal ore as it comes out of the ground. The mine is assumed to be located northern Ontario in an already serviced area such as Sudbury.

The representative mine (see Table 1) has annual sales of approximately $270 million (all dollar figures are in Canadian currency at 2005 purchasing power). It employs 480 workers of all kinds earning an average wage of approximately $85,000 per year. In addition, the employer pays its share of Employment Insurance and Canada Pension, funds significant employee benefits, and makes a large contribution to employee pensions. In total, just under $70 million of the $270 million earned by the mine is spent on employment compensation. The total employment compensation per employee is just under $145,000 (this includes benefits, pension contributions, Workplace Safety and Insurance Board (WSIB) premiums and the employer portion of Canada Pension Plan Contributions and Employment Insurance).

[2] What is meant here is the actual construction phase of the mine. The initial exploration, detailed planning, environmental studies and obtaining of permits can all take many years in advance of the actual construction.

A further $40.5 million goes to capital consumption allowances to replace capital and facilities that wear out in the course of a year's production and another $40.5 million is the gross profit of the owning corporation. Finally, $119.5 million will be spent on all of the purchased inputs required for the mine's operation during the course of the year.

Indirect Impacts – First Level Down

These purchased inputs required for the mine's operation are what give us our first level 'beneath the ground' in economic impacts. When a mine, in the course of its operations, purchases replacement machinery, transportation, and a variety of financial and scientific services, it is generating more employment, more wage income, and more GDP for Ontario. Moreover, as mentioned above, as these various purchased inputs in turn purchase inputs for their own operation, yet more economic activity is generated in the province.

As part of its operations, the mine wears out some of its capital equipment, which must be replaced -- these are the capital consumption allowances noted in Table 1. As these funds are spent to replace capital equipment additional economic activity is generated in the province.

The sum of these indirect economic impacts is considerable: Calculations show (see Table 2) that the total indirect impact amounts to over 1,100 jobs in Ontario, approximately $81 million of GDP and over $52 million of labour compensation.

These indirect impacts are spread across a wide range of industrial sectors in the province. (See the appendix tables for details.) There are also some substantial spinoffs to the other provinces, especially Québec and Alberta.

Note that for the indirect impacts the average compensation per employee (which includes employer contributions to employment insurance, Canada Pension Plan, and

employee benefits and pensions) is approximately $47,500. This is much lower than the $145,000 per employee paid directly at the mine, but is much more in line with average Ontario labour compensation. This comparison highlights how lucrative mine employment is and, correspondingly, how productive employment is in the representative mine. The 2006 OMA survey found that, on average across all Mining in Ontario, output per employee exceeded $500,000.

Induced Impacts – Second Level Down

The economic impacts of the representative mine are not confined to its indirect purchases. At a second level down, there are the induced impacts of the mine's activities. This is the economic activity that is generated when the employees of both the mine and its upstream providers spend their wages (after tax, and after savings, of course). There is also an additional but rather small effect as those working to provide consumer goods and services to the mine employees and the upstream employees in turn spend their own after-tax wages.

Our calculations show that the induced employment amounts to just under 700 jobs -- considerably greater than the 480 employed in the mine directly. The total induced labour compensation is a further $30 million and the impact on GDP is almost $46 million. Average labour compensation per employee is almost $44,000 – again, very close to the Ontario average and just a bit below that of indirect employment.

'Local' Impacts – Third Level Down

The input-output techniques and calculations that we have used to calculate the indirect and induced impacts of a representative mine unfortunately are limited to a province-wide basis. It would, of course, be very interesting to know how much of the economic activity spun off from the representative mine actually stayed within the local area or community surrounding the mine.

We have made an indirect estimate of this local economic impact retention. We carefully categorized the individual industrial impacts at the indirect and induced level into those which might reasonably be expected to remain close to the mine (for example, various personal or business services, construction or utilities). Also we identified those that are sourced generally across the province (for example, most manufactured goods and raw materials). Even so, it is clear for some industries that both local and province-wide impacts might occur. For example, to the extent that mine operation requires financial services and those working for the mine will consume financial services, some of this will be provided from local bank branches or other institutions. However, some also will be sourced at head offices or computing centers primarily in the Greater Toronto area. In these cases, we have assigned estimates of the proportion of the sector activity that is likely to remain near the mine site.

With these limitations understood, we find that a large proportion of the economic impacts of a representative mine that stay in Ontario also stay in the local area. Of the total employment of almost 2,300 jobs generated by the mine, over 1,500 are in the local area. Total local labour compensation is $115 million, and local-area GDP is just under $220 million. Average labour compensation per employee (including employer contributions to government plans, pensions and employee benefits) is almost $76,000 per worker – with the figure higher for the local mine employees, and somewhat lower for others employed through indirect and induced impacts in the local area.

Other Impacts – Fourth Level Down

Thus far we have been dealing with economic impacts that can be carefully and conservatively quantified. A single representative mine generates almost 2,300 jobs when all impact levels are considered, representing over $150 million in labour compensation and just over a quarter billion dollars in gross domestic product. We have also found that a large share of this employment in GDP impact occurs within the local region surrounding the representative mine.

But there are clearly a host of further economic and social impacts that can be associated with a representative mine which, however, simply cannot be reliably quantified. Most notable among these is the economic activity associated with maintaining the local community that the mine makes possible. This includes all Municipal workers, teachers, police, fire and health care, and all the necessary infrastructure services that are associated with maintaining a community. Mining companies make many direct contributions to the well-being of their communities -- for instance, in the provision of medical centers, sports facilities, and recreation and community centers. In larger communities and in mining regions, they support and fund universities, colleges and research facilities.

A representative mine situated in Northern Ontario, as most of them are, makes a special contribution to the well-being and development of Aboriginal communities. It targets efforts to employ and make available entrepreneurial activities to Aboriginal workers in mining activities and it sustains and develops the surrounding communities. Even when a mine closes, it leaves behind its infrastructure, and improved social fabric and a body of acquired skills that can be used to sustain the community's development into the future.

As well, mining companies in Ontario have quite generous pension plans. The spending of the considerable income from these plans by retired mine workers has not been included in the calculations above.

Moreover, the Mining industry is not static: New mines come into production and older ones can be phased out. The development of a new mine requires significant expenditure on exploration and analysis that employs some very high-productivity (and high-paid) technicians – none of which is included in out impact estimates. Even a phased-out mine generates ongoing economic activity as the site continues to be rehabilitated, returned to a natural state, and is continually monitored. Indeed, Mining is best considered as a 'temporary' land use, in that all currently active mines in Ontario, and any new mines, are required to have closure plans. They are also required to provide financial assurance to guarantee the completion of all approved reclamation activities.

Impacts on Government Revenue

Using a variety of calculation methods, it is possible to estimate the revenue impacts by level of government for our representative mine. These are summarized in Table 3.

From the annual production of $270 million of the representative mine, the federal government both directly and indirectly sees increased revenues of approximately $34 million[3]. About one half of this is from personal income tax collections (these are indeed substantial on the highly paid mine workers themselves). Corporate income tax using the assumed profitability of the representative mine amounts to approximately $12 million while $3 million is collected through Employment Insurance contributions and a further $4 million from various federal indirect taxes (including the GST and gasoline taxes).

The provincial government receives about $33 million in revenue – slightly less than the federal government, but through different tax channels: About $8 million is collected through the personal income tax, and a further $8.5 million through the corporate income tax.

As part of the corporate income tax, the special Ontario Mining Tax nets the province $3 million under the assumed 'normal' profitability of the representative mine. The Ontario Mining Tax is paid only by mineral producers, and is a profit-based royalty, which rises and falls in a fashion similar to the industry's cycles. In 2006 and 2007, when the representative mine would have seen significant additional profits due to high metal prices, the Ontario Mining tax take from the representative mine would have been considerably greater than $3 million.

Contributions to the Workplace Safety and Insurance Board (WSIB) add $4 million to provincial collections and a further $2 million is paid as Employer Health Tax (EHT).

[3] Federal revenue estimates are from economic activity generated in Ontario only. Given that the representative mine also generates some economic activity in the rest of Canada, total federal revenues generated would be somewhat higher than those reported here.

All indirect taxes, most importantly the Retail Sales Tax, earn the provincial government approximately $10 million.

Local governments collect on balance approximately $11 million in revenue. A rough estimate is that just over $8 million of this stays within the local area of the mine itself, with about $3 million going to municipal governments in other parts of the province.

Finally, the Canada Pension Plan also collects approximately $6 million in contributions.

The overall revenue take for all levels of government is approximately $84 million or well over one quarter of the amount of the mine's output value. As with all the impacts detailed above, it is important to realize that the representative mine generates these revenues and economic impacts each year through possibly several decades of operation.

II. A Representative Mine – Impacts of Mine 'Opening'

In this section, we examine the economic impacts of 'opening', or constructing, and bringing into production a 'representative' mine of the size and type detailed in the section above. The mine opening is assumed to occur in an area that already possesses much of the necessary infrastructure for mining production. That is, a road/rail and power network already exists, together with a functioning community and an available work force both to open the mine and to operate it later. One might think, for example, of developing a new nickel mine in the Sudbury area.

The economic impacts of opening a mine where no infrastructure formerly existed would be much larger, but cannot be reliably quantified in a 'representative' fashion since each such project is unique.

Just as there are layers of impacts to the operation of a representative mine, so there are also layers of impacts when the mine is being constructed or 'opened'. Using data from the Ontario Mining Association, from the Input-Output Division at Statistics Canada, and a variety of other sources, we develop direct, indirect, induced and local economic impacts from the opening of a representative mine.

Opening of a 'Representative' Mine – Surface Level

In consultation with the Ontario Mining Association, we have determined that the opening of a representative mine in a currently-serviced area could take about three years (see Table 4), with a total investment expenditure of about $450 million, or $150 million per year. Roughly 80% of this expenditure is on construction activities, and the other 20% on the wide range of machinery and equipment needed to operate the mine. As noted earlier, we are concerned with the actual construction phase here. Several years at least will have had to be spent in advance in exploration, analysis, environmental assessment and obtaining all necessary permits and community involvement.

The direct impacts of the mine construction activity and the acquisition and putting in place of the mine machinery are considerable (see Table 5): Employment generated is about 960 jobs per year, with total labour compensation of over $54 million per year. The labour compensation per employee is about $57,000 – considerably above the provincial average rate (although less than in mining production) due to the skilled and intense nature of the construction activity. Ontario GDP is directly increased by $68 million annually.

Indirect Impacts – First Level Down

As is the case for the representative mine production, the indirect impacts occur through providing inputs to the direct economic activity (when they are not imported) and of inputs to these inputs, and so on back up the production chain. For example, construction of the mine requires concrete that in turn requires quarried gravel and limestone and its transportation to the site. The machinery put in place in the mine, when sourced in Ontario, requires steel and other metallic inputs, transportation and fuel. Both construction and machinery activities require a wide range of business services.

In total, these indirect impacts create about 440 jobs and labour compensation of about $21 million. Average labour compensation is about $48,000 – fairly close to the provincial average. A further $33 million is added to Ontario GDP annually.

Induced Impacts – Second Level Down

As before, induced impacts result from the spending of the wages and salaries earned in the direct and indirect levels of economic impacts. The construction workers and those producing mining machinery, together with their suppliers, spend on consumer goods in such a way that a further 560 jobs are supported with labour compensation of $24 million. Ontario GDP is enhanced by a further $37 million annually.

When you total the direct, indirect and induced economic impacts, the opening of representative mine generates almost 2,000 jobs per year in Ontario over a three year period and adds just under $140 million per year to Ontario GDP, with labour compensation of $100 million annually.

'Local' Impacts – Third Level Down

As with the production of a representative mine, we can examine the individual industrial sectors impacted and make a rough determination of how much of the total economic activity remains in the local area of the mine opening.

Because construction, and much of its supply, is heavily localized, and because construction accounts for 80% of the total mine-opening expenditure, the local 'retention' of the mine-opening economic impacts is very high. Just under 1,300 of the nearly 2,000 total jobs created per year remain in the local area, as does $66 million of the labour compensation and almost $90 million of the GDP impact. (Recall that we are assuming that there are sufficient workers and construction infrastructure in the local area to support the mine-opening activity. If some of the workers and construction activity had to come temporarily from other regions of the province, then the provincial impacts would be largely unchanged, but the local impacts would be correspondingly smaller.)

Impacts on Government Revenue

Using the same calculation methods employed for the production of a representative mine, the annual tax impacts for the opening of a representative mine can be calculated. These are shown in Table 6.

From the $150 million annual expenditure on mine opening, the federal government earns about $20 million in revenue, with over half coming from the personal income tax,

and the remainder spread fairly evenly across the corporate income tax, Employment Insurance contributions and all federal indirect taxes.

The provincial government is estimated to take in about $19 million in revenue, with the largest contributors being the sales tax and the personal income tax. A total of $5 million is collected annually through the WSIB, corporate tax and the Employer Health Tax.

Local governments should derive about $5 million in revenue from the construction and machinery activity, with roughly $3.4 million of this staying in the vicinity of the new mine itself.

Lastly, the CPP gains over $5 million in new annual contributions while the mine opening is occurring. The total impact on government revenue through all levels of activity is just under $50 million per year.

Appendix: Impacts by Industrial Sector and by Province

The 'Representative Mine' in Production

Our calculations permit us to determine the impacts of a representative mine on the different industrial sectors in Ontario, and in fact on those of other provinces as well. At the 'Small' or most highly-aggregated Statistics Canada industrial classification, these are presented in Appendix Tables A.1 (for GDP) and A.2 (for employment).[4]

Consider first the industrial impacts for Ontario: Of course, the largest impact is in the Mining industry, where the direct impacts of the representative mine all occur. The remaining impacts are widely spread across other industrial sectors, with the primary impacts being in Utilities, Construction, Manufacturing, Trade (Wholesale and Retail), Finance, Insurance and Real Estate (which also includes equipment leasing and building rental and supervision), Professional, Scientific and Technical Services, and Administrative Support, Waste Management and Remediation.

Most of the 'leakage' of demand for goods and services from the representative mine and from its indirect and induced impacts tends to occur into imports from other countries, but there is still an important impact on several Canadian provinces. The biggest impact outside Ontario, both in terms of employment and GDP, occurs in Québec, predominantly in manufactured goods and wholesale trade. The next largest province impacted is Alberta: The representative mine adds a $6 million to Alberta GDP and 42 jobs. The GDP impact is predominantly in the provision of oil and gas, and the employment impact is spread relatively widely across a broad number of sectors. For Canada as a whole outside of Ontario the representative mine creates approximately $22 million in GDP and almost 300 jobs. We have no estimate of the tax impacts of this activity outside of Ontario.

[4] In one respect, the impacts for provinces other than Ontario are incomplete: Our calculations do not include the impact of the re-spending of labour incomes earned in other provinces from supplying indirect and induced impacts in Ontario.

Impacts of Opening a Representative Mine

The impacts of opening a representative mine can also be examined by industrial sector, and again we can estimate the impacts on provinces outside of Ontario. These results are presented in Appendix Tables A.3 (for GDP) and A.4 (for employment).

In Ontario, the largest sectoral impact is on Construction, as might have been expected, which accounts for roughly half of the provincial impacts. The next largest sector is Manufacturing, stemming from the demand for machinery and also for concrete, reinforcing rods and other inputs to Construction. A considerably portion of the actual machinery required by the mine comes from imports. The remaining impacts are spread widely among the other sectors, but note the important impacts on 'Finance, Insurance, Real Estate and Rental and Leasing', reflecting both financing activity and the leasing or rental of special construction equipment as needed, and on 'Professional, Scientific and Technical Services', as there is much careful scientific planning and engineering work that goes into mine development.

Outside Ontario a representative mine opening generates about $13 million per year of GDP. About half of this impact is in Québec, with a large impact on manufacturing, and the next largest impact is in Alberta, based both on fuel requirements and again on manufacturing.

Table 1: An Ontario 'Representative' Mine in Production Characteristics

- Produces non-ferrous metal ores: (primarily nickel, copper)
- Roughly the average size of the 12 major operating mines in Ontario
- Includes initial on-site milling operations
- All dollar amounts are in millions of 2005 Canadian dollars

Mine Output/Sales	$270.0
Number of Employees on site	480
Average wage per employee ($ '000)	$85.0
Employment Costs	
Wage Bill	$40.8
Pension Contributions	$22.4
Employee Benefits	$2.0
Canada Pension, Employment Insurance, Workplace Safety, Employer Health Tax	$4.2
Total	$69.5
Capital Consumption Allowance (Depreciation)	$40.5
Gross Profit (before taxes)	$40.5
Purchased Inputs and Production Costs	$119.5

Table 2: Annual Economic Impacts of An Ontario 'Representative' Mine in Production

- All dollar amounts are in millions of 2005 Canadian dollars
- Employment is in person-years

Mine Output/Sales	$270.0
Surface Level - Direct Impacts	
Employment	480
Total Labour Compensation	$69.5
Gross Domestic Product	$150.5
Labour Compensation/Employee ($ '000)	$144.7
Level One - Indirect Impacts	
Employment	1,103
Total Labour Compensation	$52.3
Gross Domestic Product	$81.4
Labour Compensation/Employee ($ '000)	$47.5
Level Two - Induced Impacts	
Employment	697
Total Labour Compensation	$30.4
Gross Domestic Product	$45.9
Labour Compensation/Employee ($ '000)	$43.6
Total - Direct, Indirect and Induced Impacts	
Employment	2,280
Total Labour Compensation	$152.2
Gross Domestic Product	$277.8
Labour Compensation/Employee ($ '000)	$66.8
Level Three - Local Area Impacts	
Employment	1,519
Total Labour Compensation	$115.1
Gross Domestic Product	$219.5
Labour Compensation/Employee ($ '000)	$75.8

Table 3: Annual Revenue Impacts of An Ontario 'Representative' Mine in Production

- All dollar amounts are in millions of 2005 Canadian dollars

	Total	Direct	Indirect	Induced
Mine Output/Sales	$270.0			
Federal Government				
Personal Income Tax	$15.2	$6.9	$5.3	$2.9
Corporate Income Tax	$11.8	$8.5	$2.2	$1.1
Employment Insurance Contributions	$2.9	$0.8	$1.3	$0.7
All Indirect Taxes (GST, Gasoline, etc.)	$4.4	$0.4	$0.7	$3.3
Total:	$34.2	$16.7	$9.6	$8.0
Provincial Government				
Personal Income Tax	$8.0	$3.7	$2.7	$1.5
Corporate Income Tax	$8.5	$6.6	$1.3	$0.6
of which: Mining Tax	$3.0	$3.0		
Workplace Safety (WSIB) Contributions	$3.9	$2.0	$1.2	$0.7
Employer Health Tax	$2.0	$0.8	$0.7	$0.4
All Indirect Taxes (Retail Sales, etc.)	$10.3	$2.4	$3.4	$4.6
Total:	$32.6	$15.5	$9.3	$7.8
Municipal Government				
All Indirect Taxes (Property, etc.)	$10.6	$5.7	$3.1	$1.7
(Municipal Taxes in Mine Locality)	$8.3			
Canada Pension Plan Contributions	$6.3	$1.8	$2.9	$1.7
Total - All Governments	$83.8	$39.7	$24.8	$19.2

Table 4: An Ontario 'Representative' Mine in its 'Opening' or Construction Phase - 2006

- Mine opened in a region with existing infrastrucuture
- All dollar amounts are in millions of 2005 Canadian dollars

Total Mine Opening or Construction Cost	$450.0
Expenditure per Year over Three-Year Period	$150.0
Proportion of Expenditure in Construction	0.80
Proportion of Expenditure in Machinery & Equipment	0.20

Table 5: Annual Economic Impacts of Opening An Ontario 'Representative' Mine

- All dollar amounts are in millions of 2005 Canadian dollars
- Employment is in person-years

Annual Mine Opening Expenditure	$150.0
Surface Level - Direct Impacts	
Employment	957
Total Labour Compensation	$54.5
Gross Domestic Product	$68.4
Labour Compensation/Employee	$56.9
Level One - Indirect Impacts	
Employment	441
Total Labour Compensation	$21.3
Gross Domestic Product	$33.2
Labour Compensation/Employee	$48.2
Level Two - Induced Impacts	
Employment	561
Total Labour Compensation	$24.5
Gross Domestic Product	$37.0
Labour Compensation/Employee	$43.6
Total - Direct, Indirect and Induced Impacts	
Employment	1,959
Total Labour Compensation	$100.2
Gross Domestic Product	$138.5
Labour Compensation/Employee	$51.2
Level Three - Local Area Impacts	
Employment	1,281
Total Labour Compensation	$66.4
Gross Domestic Product	$88.7
Labour Compensation/Employee	$51.8

Table 6: Annual Revenue Impacts of Opening An Ontario 'Representative' Mine

- All dollar amounts are in millions of 2005 Canadian dollars

	Total	Direct	Indirect	Induced
Total Annual Mine-Opening Expenditure	$150.0			
Federal Government				
Personal Income Tax	$11.3	$6.8	$2.2	$2.3
Corporate Income Tax	$2.8	$1.1	$0.9	$0.9
Employment Insurance Contributions	$2.5	$1.3	$0.5	$0.6
All Indirect Taxes (GST, Gasoline, etc.)	$3.1	$0.3	$0.2	$2.6
Total:	$19.7	$9.5	$3.7	$6.4
Provincial Government				
Personal Income Tax	$5.8	$3.4	$1.1	$1.2
Corporate Income Tax	$1.6	$0.6	$0.5	$0.5
Workplace Safety (WSIB) Contributions	$2.3	$1.2	$0.5	$0.6
Employer Health Tax	$1.4	$0.8	$0.3	$0.4
All Indirect Taxes (Retail Sales, etc.)	$7.6	$2.7	$1.3	$3.7
Total:	$18.7	$8.7	$3.7	$6.3
Municipal Government				
All Indirect Taxes (Property, etc.)	$5.3	$2.6	$1.3	$1.4
(Municipal Taxes in Mine Locality)	$3.4			
Canada Pension Plan Contributions	$5.5	$3.0	$1.2	$1.3
Total - All Governments	$49.1	$23.8	$9.8	$15.5

Table A.1 Total GDP Impacts of a Representative Mine

(Thousands Cdn$)

		Ontario	Québec	Alberta	B. C.	Canada Total
Industries						
1	Crop and Animal Production	340	95	61	10	**616**
2	Forestry and Logging	79	32	6	42	**174**
3	Fishing, Hunting and Trapping	1	1	0	1	**13**
4	Support Activities for Agriculture and forestry	29	13	12	14	**80**
5	Mining and Oil and Gas Extraction	154,750	256	3,455	326	**159,776**
6	Utilities	11,772	582	81	34	**12,664**
7	Construction	13,913	55	43	25	**14,080**
8	Manufacturing	14,754	2,534	518	729	**19,201**
9	Wholesale Trade	9,625	1,020	304	354	**11,602**
10	Retail Trade	7,078	192	52	52	**7,447**
11	Transportation and Warehousing	5,190	749	404	434	**7,449**
12	Information and Cultural Industries	4,459	413	149	181	**5,350**
13	Finance, Insurance, Real Estate and Rental and Leasing	23,941	849	465	382	**25,978**
14	Professional, Scientific and Technical Services	11,713	658	228	217	**12,916**
15	Administrative and Support, Waste Management and Remediation Services	5,287	586	171	86	**6,214**
16	Educational Services	185	6	2	2	**198**
17	Health Care and Social Assistance	1,562	28	5	4	**1,606**
18	Arts, Entertainment and Recreation	598	65	10	12	**694**
19	Accommodation and Food Services	1,881	160	73	80	**2,293**
20	Other Services (Except Public Administration)	1,572	98	49	29	**1,778**
24	Non-Profit Institutions Serving Households	755	6	2	2	**767**
25	Government Sector	8,112	129	41	35	**8,364**
Total		**277,596**	**8,526**	**6,130**	**3,052**	**299,259**

Table A.2 Total Employment Impacts of a Representative Mine

(Number of jobs)

		Ontario	Québec	Alberta	B. C.	Canada Total
Industries (Small aggregation)						
1	Crop and Animal Production	9	1	1	0	**15**
2	Forestry and Logging	1	0	0	0	**2**
3	Fishing, Hunting and Trapping	0	0	0	0	**0**
4	Support Activities for Agriculture and forestry	1	0	0	0	**2**
5	Mining and Oil and Gas Extraction	521	3	6	1	**531**
6	Utilities	45	2	0	0	**49**
7	Construction	241	1	1	0	**244**
8	Manufacturing	157	32	5	7	**211**
9	Wholesale Trade	133	17	4	6	**165**
10	Retail Trade	208	6	2	1	**219**
11	Transportation and Warehousing	75	13	5	6	**108**
12	Information and Cultural Industries	47	4	1	2	**56**
13	Finance, Insurance, Real Estate and Rental and Leasing	181	8	4	4	**201**
14	Professional, Scientific and Technical Services	190	13	4	5	**214**
15	Administrative and Support, Waste Management and Remediation Services	152	15	4	2	**175**
16	Educational Services	7	0	0	0	**7**
17	Health Care and Social Assistance	29	0	0	0	**29**
18	Arts, Entertainment and Recreation	19	2	0	1	**23**
19	Accommodation and Food Services	81	6	2	3	**96**
20	Other Services (Except Public	46	3	1	1	**52**
24	Non-Profit Institutions Serving Households	19	0	0	0	**20**
25	Government Sector	117	2	1	1	**121**
Total		**2,280**	**129**	**42**	**40**	**2,539**

Table A.3 Annual GDP Impacts of Opening a Representative Mine

(Thousands Cdn$)

		Ontario	Québec	Alberta	B. C.	Canada Total
Industries						
1	Crop and Animal Production	261	69	44	7	**460**
2	Forestry and Logging	100	29	5	37	**182**
3	Fishing, Hunting and Trapping	1	1	0	1	**9**
4	Support Activities for Agriculture and forestry	22	9	5	7	**49**
5	Mining and Oil and Gas Extraction	3,930	271	1,197	103	**5,916**
6	Utilities	1,572	226	43	16	**1,909**
7	Construction	77,671	41	20	13	**77,767**
8	Manufacturing	17,053	2,459	545	306	**20,962**
9	Wholesale Trade	6,530	730	198	216	**7,876**
10	Retail Trade	5,429	140	31	33	**5,683**
11	Transportation and Warehousing	2,719	487	234	228	**4,039**
12	Information and Cultural Industries	2,828	268	88	110	**3,385**
13	Finance, Insurance, Real Estate and Rental and Leasing	14,519	519	237	193	**15,656**
14	Professional, Scientific and Technical Services	11,393	485	186	192	**12,330**
15	Administrative and Support, Waste Management and Remediation Services	2,111	296	83	43	**2,579**
16	Educational Services	153	4	1	1	**160**
17	Health Care and Social Assistance	1,151	15	3	2	**1,174**
18	Arts, Entertainment and Recreation	383	39	6	7	**441**
19	Accommodation and Food Services	1,079	86	36	39	**1,292**
20	Other Services (Except Public Administration)	1,147	69	34	18	**1,288**
24	Non-Profit Institutions Serving Households	600	5	1	1	**609**
25	Government Sector	6,168	85	24	22	**6,325**
Total		**156,819**	**6,333**	**3,021**	**1,595**	**170,091**

Table A.4 Annual Total Employment Impacts of Opening a Representative Mine
(Number of jobs)

		Ontario	Québec	Alberta	B. C.	Canada Total
Industries (Small aggregation)						
1	Crop and Animal Production	7	1	1	0	**11**
2	Forestry and Logging	1	0	0	0	**2**
3	Fishing, Hunting and Trapping	0	0	0	0	**0**
4	Support Activities for Agriculture and forestry	1	0	0	0	**1**
5	Mining and Oil and Gas Extraction	40	3	2	0	**46**
6	Utilities	6	1	0	0	**7**
7	Construction	1,090	1	0	0	**1,092**
8	Manufacturing	198	32	6	4	**249**
9	Wholesale Trade	90	12	3	4	**112**
10	Retail Trade	159	4	1	1	**167**
11	Transportation and Warehousing	42	8	3	3	**62**
12	Information and Cultural Industries	30	3	1	1	**36**
13	Finance, Insurance, Real Estate and Rental and Leasing	91	5	2	2	**102**
14	Professional, Scientific and Technical Services	176	9	3	4	**194**
15	Administrative and Support, Waste Management and Remediation Services	55	7	2	1	**67**
16	Educational Services	6	0	0	0	**6**
17	Health Care and Social Assistance	21	0	0	0	**22**
18	Arts, Entertainment and Recreation	12	1	0	0	**14**
19	Accommodation and Food Services	47	3	1	1	**55**
20	Other Services (Except Public	34	2	1	0	**38**
24	Non-Profit Institutions Serving Households	15	0	0	0	**16**
25	Government Sector	89	1	0	0	**91**
Total		**2,211**	**96**	**26**	**24**	**2,388**