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Research Report

Enbridge Pipeline Construction Economic Impact Study

Prepared for the
Minnesota Agriculture & Energy Alliance

Bureau of Business and
Economic Research

Labovitz School
OF BUSINESS AND ECONOMICS

UNIVERSITY OF MINNESOTA DULUTH

Driven to Discover

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Enbridge provided the majority of inputs for this report. Where data was not available from Enbridge, the BBER utilized IMPLAN, industry standards, and other secondary data sources. The BBER relied upon the completeness, accuracy, and fair presentation of all data and information obtained from Enbridge and/or their agents. The report is conditional upon the completeness, accuracy, and fair presentation of that data and information. The BBER does not promise or guarantee the outcome of these results but rather is providing projections based upon inputs and outputs using IMPLAN software.

The BBER was asked to supply an economic impact analysis only. This analysis does not consider the social or environmental impacts of the project and should not be viewed as a cost benefit analysis or environmental impact assessment.

Media requests should be directed to Holli VanOverbeke at Weber Johnson Public Affairs, (651) 454-3002 or holli@weberjohnsonpa.com .

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Executive Summary

Enbridge Pipelines (North Dakota) LLC is proposing to build the 610-mile Sandpiper Pipeline, which would transport North Dakota light crude petroleum from Beaver Lodge Station in Tioga, North Dakota, to the existing Enbridge terminal in Superior, Wisconsin. The proposed pipeline would follow a route through ten North Dakota counties and eight Minnesota counties ending in Douglas County, Wisconsin. In addition, Enbridge is proposing replacement of the existing Line 3 pipeline, which would run along much of the same route of the proposed Sandpiper line.

The Minnesota Agriculture & Energy Alliance, in cooperation with Weber Johnson Public Affairs, asked the Bureau of Business and Economic Research (BBER), an entity of the University of Minnesota Duluth's Labovitz School of Business and Economics, to assess the economic impact of the construction of the proposed Enbridge Sandpiper Pipeline and the replacement of Line 3 on the proposed affected Minnesota counties, which total 15. The study includes a special focus on the economic impacts to the retail and hospitality industries in the selected region. The BBER used county data and impact models for value added, employment, and output measures.

The economic modeling data and software used was IMPLAN. The study used IMPLAN's economic multiplier analysis and input/output modeling. Data used were the most recent IMPLAN data, which is for year 2013. Results of modeling are reflected in 2015 dollars

According to the results of this analysis, it is estimated that construction of the Sandpiper line will support approximately 4,800 jobs in the

region during the two-year period, 1,410 of which are expected to be filled by construction workers from outside the 15-county study area. Enbridge expects to spend more than \$934 million within the study area over the course of the Sandpiper construction project – leading to a total output impact of \$1.3 billion regionally in combined direct, indirect, and induced spending effects.

The Line 3 replacement project is estimated to support, directly and indirectly, approximately 7,700 jobs over the two-year period, 2,340 of which are expected to be filled by construction workers from outside the 15-county study area. In total, Enbridge expects to spend more than \$1.4 billion within the study area during the Line 3 replacement project, leading to a total output impact of \$2.0 billion regionally in combined direct, indirect, and induced spending effects.

For both projects, the bulk of the economic impacts will come from the company's construction expenditures, including site preparation, procurement, engineering, and environmental costs. In the case of the Sandpiper Line project, construction spending is expected to support more than 4,300 jobs in the study region and lead to more than \$1.2 billion in new spending during the two-year period. The construction spending for the Line 3 replacement is expected to support more than 6,900 jobs in the study region and lead to more than \$1.8 billion in new spending during the two-year period.

A smaller, but still significant, portion of the impact from the projects will come from spending on the part of the non-local

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construction workers brought in for the project. Approximately half of the workforce for both construction projects will be sourced from outside of the study area, and much of their income will leave the study area. However, these workers will spend some portion of their income on lodging, restaurants, and other incidental expenses. The BBER research team estimated that non-local workers brought on for the Sandpiper Line would spend approximately \$52 million over the course of the construction project, supporting nearly 500 jobs throughout the study region and leading to more than \$80 million in combined direct, indirect, and induced spending. Non-local workers for the Line 3 construction project are expected to spend upwards of \$86 million within the study area over the course of the construction

project, supporting nearly 800 jobs and leading to about \$135 million in combined direct, indirect, and induced spending.

Finally, this analysis examined the impacts of the Sandpiper and Line 3 projects on the Retail and Hospitality sectors in the study area. In total, it is expected that the Sandpiper project will support more than 1,000 jobs in Retail and Hospitality during the two-year period, and the Line 3 replacement would support more than 1,600 jobs within those same industries. In both cases, the sectors seeing the greatest benefits include Non-store Retailers, Other Accommodations (e.g. resorts, campgrounds, RV parks), Hotels and Motels, and Full-Service Restaurants.

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Enbridge Pipeline Construction Economic Impact Study

I. Project Description

Enbridge Pipelines (North Dakota) LLC is proposing to build the 610-mile Sandpiper Pipeline, which would transport North Dakota light crude petroleum from Beaver Lodge Station in Tioga, North Dakota, to the existing Enbridge terminal in Superior, Wisconsin. The proposed pipeline would follow a route through ten North Dakota counties and eight Minnesota counties ending in Douglas County, Wisconsin. In addition, Enbridge is proposing replacement of the existing Line 3 pipeline, which would travel along much of the same route of the proposed Sandpiper line.

The Minnesota Agriculture & Energy Alliance, in cooperation with Weber Johnson Public Affairs, asked the Bureau of Business and Economic Research (BBER), an entity of the University of Minnesota Duluth's Labovitz School of Business and Economics, to assess the economic impact of the construction of the proposed Enbridge Sandpiper Pipeline and the replacement of Line 3 on the affected Minnesota counties. In addition, this study includes a special focus on the economic impacts to the retail and hospitality industries in the selected region as a result of increased economic activity during the project. The BBER used county data and impact models for value added, employment, and output measures.

The study used IMPLAN¹ economic modeling data and software, specifically, IMPLAN's economic multiplier analysis and input/output modeling. Data used were the most recent IMPLAN data, which is for year 2013. Results of modeling are reflected in 2015 dollars and are presented here in a digital, written report.

Deliverables

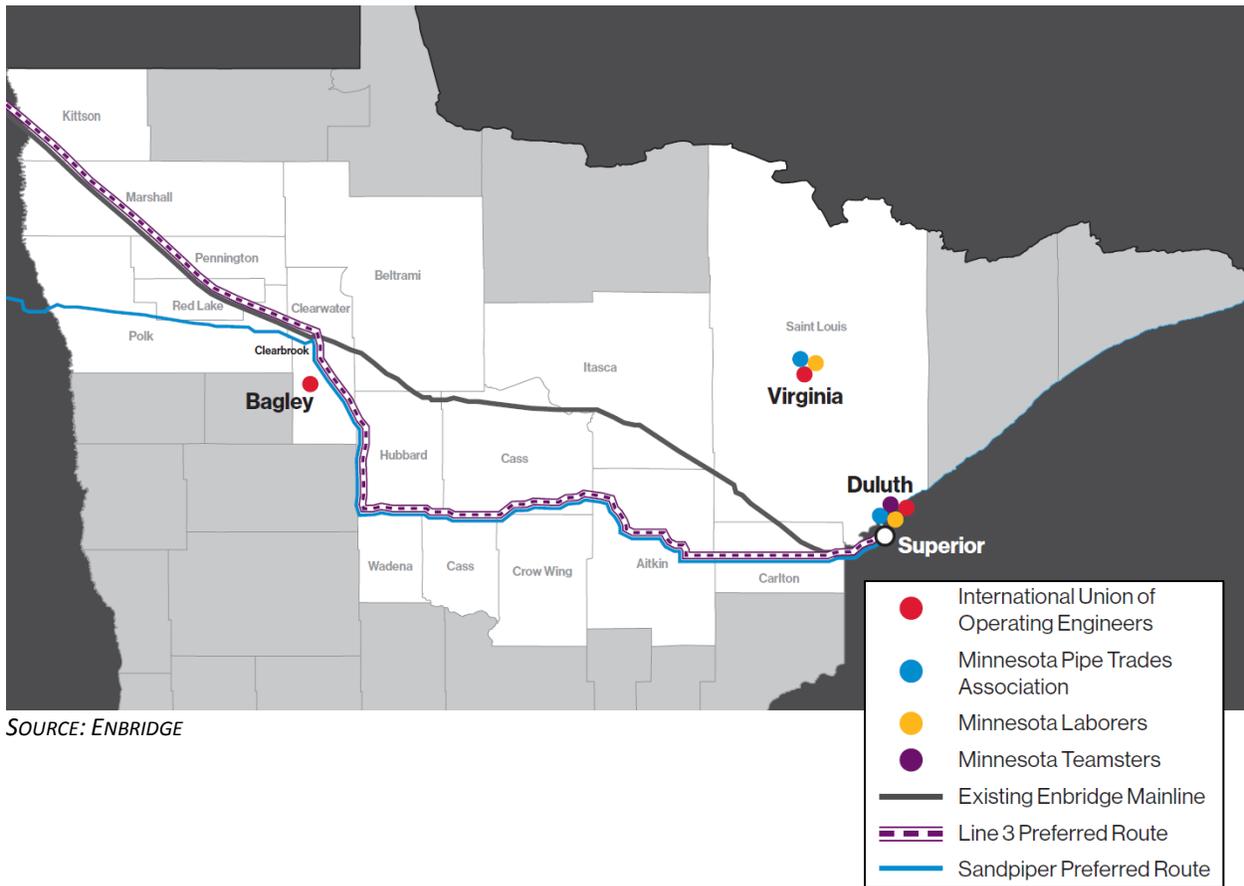
- The BBER reported the direct, indirect, and induced economic impacts from the construction of the Sandpiper Pipeline and the replacement of Line 3 on the study area with a special focus on the impacts to the retail and hospitality industries.
- Data were configured by route and project phases/years.
- The BBER presented the findings in a digital report.

¹ IMPLAN is used by more than 570 clients, including 100 state government agencies and 25 national agencies. IMPLAN Group LLC, 16740 Birkdale Commons Pkwy, Suite 212, Huntersville, NC 28078 www.implan.com

Study Area

The geographic scope for this economic impact analysis includes the fifteen Minnesota counties of Kittson, Marshall, Pennington, Red Lake, Polk, Clearwater, Beltrami, Hubbard, Wadena, Cass, Crow Wing, Itasca, Aitkin, Carlton, and Saint Louis, according to the map below. These counties represent the proposed route of the Sandpiper Line as well as the existing route of Line 3. Enbridge expects that approximately half of the workforce required for the Sandpiper and Line 3 projects will come from within this region. The counties included in the study are primarily rural and encompass a significant portion of the northern half of the state of Minnesota. Major cities within the region include Duluth, Hibbing, Bemidji, Brainerd, Cloquet, and Grand Rapids.

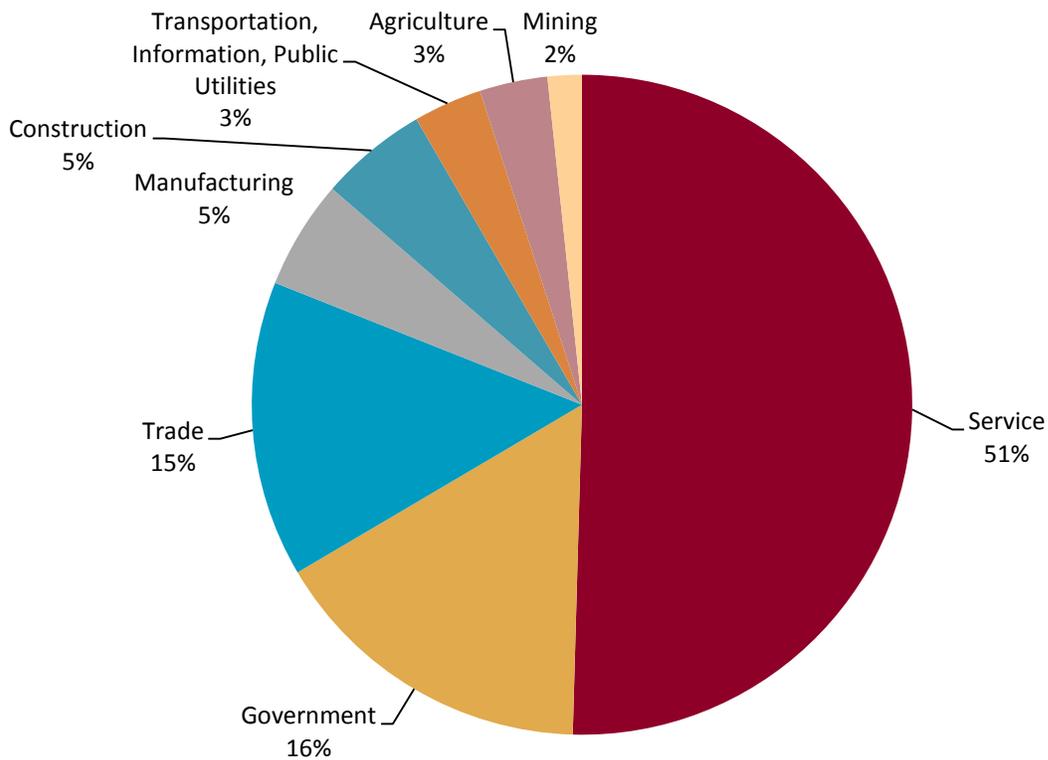
Figure 1. MN map with project study area highlighted in white



SOURCE: ENBRIDGE

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Figure 2. Employment by Industry for Study Area, 2013



SOURCE: IMPLAN, 2015

Figures 2 and 3 provide background on the regional economy of the study area as context for the results of the report. Figure 2 shows employment by industry. In 2013, more than half of the 320,000 jobs in the study area came from the Service industry, which includes Health Care, Education, and Hospitality. The other largest industries in the region, measured in employment, included Government, Trade, and Manufacturing. Construction employment represented approximately 5% of the jobs in the region in 2013, with about 15,000 workers in the study area employed in that industry.

Figure 3. Top Sectors by Employment for Study Area, 2013



SOURCE: IMPLAN, 2015

Figure 3 shows the top sectors within the study area as measured by overall employment. This figure provides more detail into the sectors that employ the largest numbers. Hospitals, Full-Service Restaurants, Nursing and Community Care Facilities, and Limited-Service Restaurants represent a substantial portion of the jobs in the Service industry in the study area. The Local Government sector is another significant local employer. This study will focus primarily on IMPLAN sector 58—Construction of Other New Nonresidential Structures, shown in gold. This sector was ranked 31st in terms of overall employment in 2013, with nearly 2,600 workers. In addition, the study includes a special focus on the impacts of the construction project on Retail and Hospitality sectors in the region. The largest Retail and Hospitality sectors include Full-Service Restaurants, Limited-Service Restaurants, Retail – General Merchandise Stores, Retail –Food and Beverage Stores, and Retail – Non-store Retailers. All employ more than 4,000 individuals within the study area.

II. Inputs and Assumptions

The following section describes the inputs required for modeling the impacts of the construction projects and non-local construction worker spending and the assumptions made when developing the models. Inputs used include major construction expenditures, employment estimates, employee compensation, and the percentage of local labor and equipment purchases. Data were provided by Enbridge representatives. The research team worked under the assumption that the company provided good-faith estimates for both projects. In instances where data was not provided by Enbridge, the research team relied on IMPLAN estimates and secondary data sources as inputs.

Effects of Construction – Sandpiper Line

Construction of the Sandpiper Line is anticipated to begin in the fourth quarter of 2016, with the bulk of the work happening in 2017 and project completion expected in late 2018. For simplicity, we assume a two-year construction period with costs equally distributed between the years 2017 and 2018. The distribution of employment and spending does not greatly affect the overall results of the study.

The construction of the Sandpiper Line will generate a temporary increase in economic activity during the course of the construction project. Throughout the project, increased demand for equipment, labor, and transportation will lead to increased economic activity in the affected counties. After the completion of the project, this additional activity will cease and the economic impacts will no longer be felt in the region.

Table 1. Sandpiper Line Expenditures (in Millions of Dollars)

<i>Budget item</i>	<i>Total Spending</i>	<i>% Spent in Study Area</i>	<i>Direct Spending in Study Area</i>	<i>Year 1 (2017)</i>	<i>Year 2 (2018)</i>
Site preparation-Construction	\$640.9	100%	\$640.9	\$320.5	\$320.5
Site preparation-Project management	\$242.8	100%	\$242.8	\$121.4	\$121.4
Procurement	\$286.6	10%	\$28.7	\$14.3	\$14.3
Engineering	\$39.6	90%	\$35.6	\$17.8	\$17.8
Environment	\$54.6	23%	\$12.7	\$6.4	\$6.4
Total Costs	\$1,264.5		\$960.7	\$480.3	\$480.3

SOURCE: ENBRIDGE, IMPLAN

The total budget for the Minnesota portion of the Sandpiper project is expected to total nearly \$1.3 billion over the two-year period². Table 1 shows Sandpiper Line expenditures for the two-year period by major purchase, as well as the percentage of each budget item that is expected to be sourced within the study area. IMPLAN requires that, for construction modeling, the full value of the structure be included in the study area and that non-local purchases be accounted for by the Regional Purchasing Coefficients in the Industry Spending Pattern³. The logic behind this reasoning is that while these inputs may come

² Includes all construction expenses with the exception of land acquisition costs, which are not used in economic impact modeling.

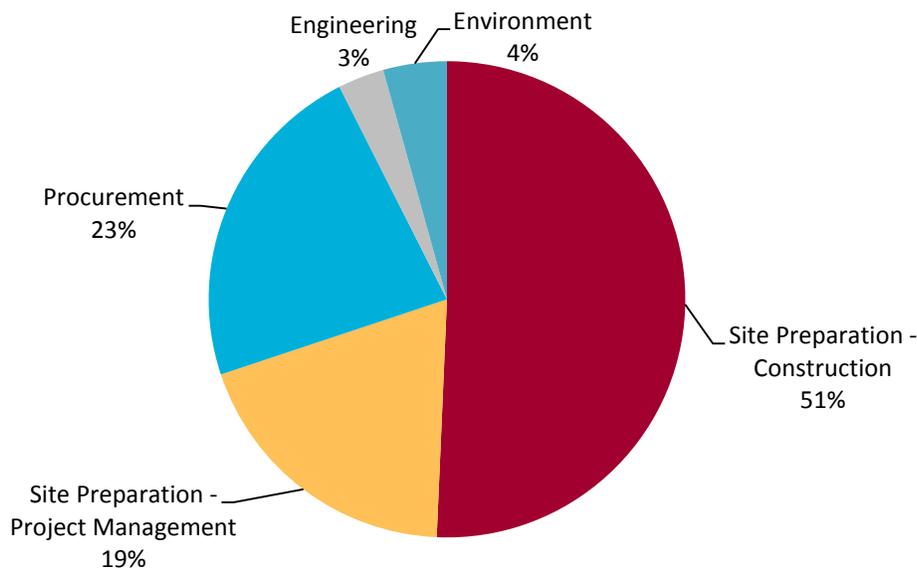
³ IMPLAN Support Forum

https://implan.com/index.php?option=com_kunena&view=category&Itemid=1841&layout=list

from outside the study area, they now make up part of the value of the structure. For that reason, 100% of site preparation costs were considered to be spent within the study area⁴. The percentage spent within the study area on the other budget items (procurement, engineering, and environment) were modified based on the estimates provided by Enbridge or by using IMPLAN's average local purchase percentages⁵. As this project has not yet begun, Enbridge representatives used information from previous projects to estimate expenditures and purchases within the study area.

More than half of the costs for the project are in Site Preparation – Construction. Procurement costs (equipment, purchases) represent about one quarter (23%) of the total project budget. Site Preparation – Project Management (19%), Environmental Consulting (4%), and Engineering (3%) costs make up the remainder of the expenditures (see Figure 4).

Figure 4. Sandpiper - Construction Spending by Major Expenditure



SOURCE: ENBRIDGE

Enbridge estimates that the construction of the Minnesota portion of the Sandpiper line will require 2,820 workers, with approximately half of those coming from within the study area (1,410), and the other half from outside that region. To account for this, employee compensation for the construction project was reduced by approximately 50%⁶ to represent the leakage from non-local workers' spending outside of the study area. The economic activity generated as a result of per diem spending by non-local workers is analyzed separately.

⁴ The estimate of 100% only affects the first round of direct spending. Indirect and induced spending estimates were based on IMPLAN spending patterns.

⁵ The share of environmental costs sourced locally was not provided by the company, therefore, the IMPLAN average for the study area (23%) was used instead.

⁶ Local employee compensation was calculated using the following equation: Local Employee Compensation = Total Employee Compensation * [(1- expected commuting rate)/(1- typical commuting rate)]

Effects of Construction – Line 3

The budget for the Minnesota portion of the Line 3 replacement is expected to total \$1.9 billion over the two-year period⁷. Table 2 shows expenditures for the Line 3 replacement project by major purchase over the two-year period, as well as the percentage of each budget item that is expected to be sourced within the study area.

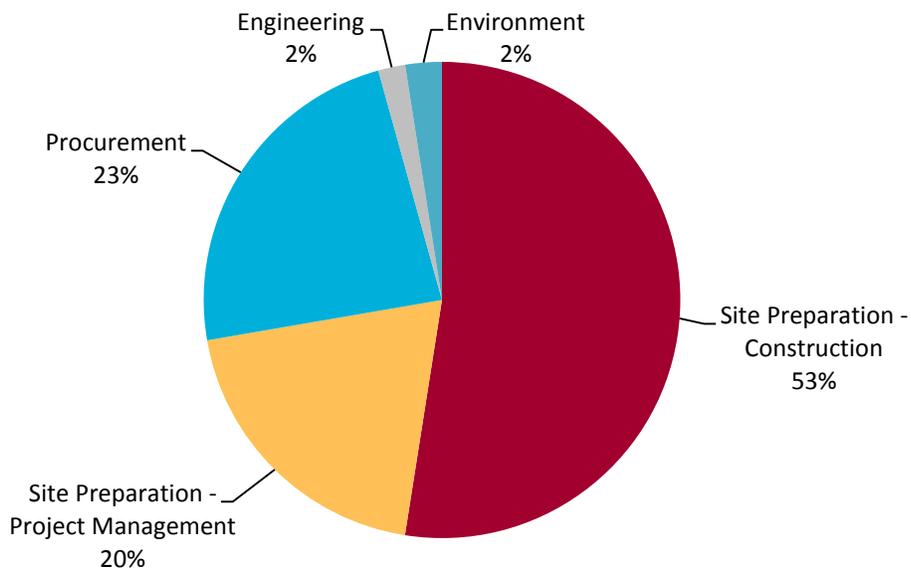
Table 2. Line 3 Expenditures (in Millions of Dollars)

Budget item	Total Spending	% Spent in Study Area	Direct Spending in Study Area	Year 1 (2017)	Year 2 (2018)
Site preparation-Construction	\$998.7	100%	\$998.7	\$499.4	\$499.4
Site preparation-Project management	\$376.8	100%	\$376.8	\$188.4	\$188.4
Procurement	\$445.4	10%	\$44.5	\$22.3	\$22.3
Engineering	\$34.7	90%	\$31.3	\$15.6	\$15.6
Environment	\$47.1	23%	\$11.0	\$5.5	\$5.5
Total Costs	\$1,902.9		\$1,462.3	\$731.2	\$731.2

SOURCE: ENBRIDGE, IMPLAN

The budget for the Line 3 replacement project looks very similar to the Sandpiper project, but with a larger share spent on site preparation and a smaller share spent on engineering and environmental costs (see Figure 5).

Figure 5. Line 3 Replacement - Construction Spending by Major Expenditure



SOURCE: ENBRIDGE

⁷ Includes all construction expenses with the exception of land acquisition costs

Like the Sandpiper Line, Enbridge estimates that the replacement of the Minnesota portion of Line 3 will require 4,681 workers, with approximately half of those coming from within the study area (2,341), and the other half from outside the region. Again, employee compensation for the construction project was adjusted to represent the leakage from non-local workers' spending outside of the study area.

Table 3 shows the IMPLAN sectors used in modeling the construction impacts for the Sandpiper and Line 3 projects. For both projects, the site preparation costs (including construction and project management) were modeled in sector 58 using a method called Analysis by Parts. Analysis by Parts is the process of splitting or parsing an impact analysis issue into smaller and more specific parts. This technique allows the user to specify the amount of commodity inputs, the proportion of local labor income, and the proportion of local purchases. The remaining budget items (Procurement, Engineering, and Environment) were modeled in sectors 395 (Wholesale Trade), 449 (Architectural, Engineering, and Related Services), and 455 (Environmental and Other Technical Consulting Services), respectively.

Table 3. IMPLAN Sectors Used in Modeling

<i>Sector</i>	<i>Description</i>
58	Construction of other new nonresidential structures
395	Wholesale trade
449	Architectural, engineering, and related services
455	Environmental and other technical consulting services

SOURCE: IMPLAN, 2015

Non-Local Worker Spending

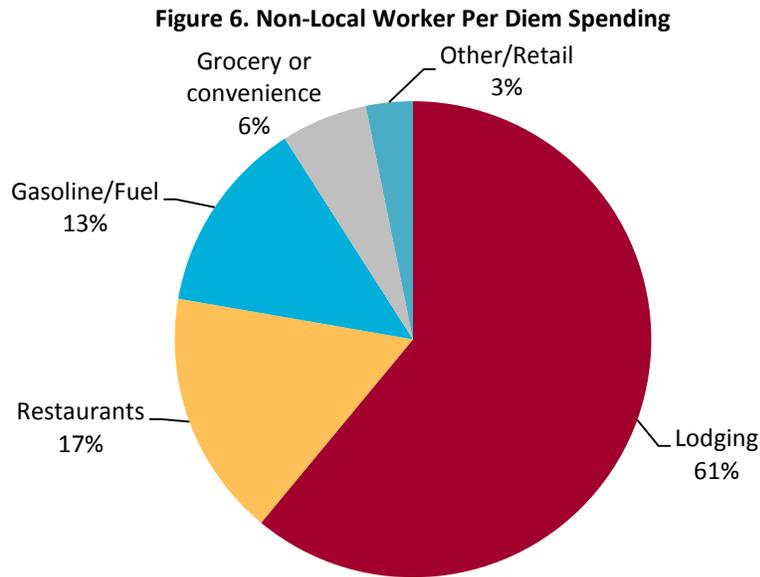
Approximately half of the workers employed during the construction of the Sandpiper and Line 3 pipelines are expected to come from outside the study area. During the project, these workers will spend a per diem on expenses, such as lodging, meals, gasoline, and retail. To determine the economic impacts of this spending, the research team first estimated the total amount spent by non-local workers, using the numbers of workers, their average length of stay for each project, and their per diem spending allowance.

Enbridge did not provide the research team with per diem totals, therefore, estimates were calculated using FY2016 Per Diem Standard Rates for Minnesota, provided by the General Service Administration (GSA)⁸. The rates are \$89 for lodging expenses and \$51 for meals and incidentals. In total, the amount spent per non-local worker on these expenses was estimated to be \$586 each week. Assuming an average length of employment for each non-local worker of 1.3 years⁹, or 68 weeks, the total per diem spent in the study area for each non-local worker was estimated to equal nearly \$40,000 over the two-year period. This equates to \$55.8 million in direct retail and hospitality spending on the part of non-local Sandpiper construction workers and \$92.6 million in direct spending by non-local Line 3 construction workers.

⁸ <http://www.gsa.gov/portal/category/100120>

⁹ Source: Enbridge representatives

A non-local construction worker spending pattern was then developed using the GSA guidelines along with information from regional tourism studies. Figure 6 shows that spending pattern. Based on GSA guidelines, workers receive \$356 per week for lodging expenses and \$230 per week on meals and incidentals. This means that 61% of the per diem spending would go to lodging, and the remainder would be for meals and other expenses, including gasoline, laundry, and miscellaneous retail expenditures.



SOURCE: GSA, IMPLAN, RELEVANT LITERATURE

Table 4. Sectors and Direct Effects Used in Modeling Non-Local Worker Spending

<i>Sector</i>	<i>Description</i>	<i>Direct Effects Sandpiper</i>	<i>Direct Effects Line 3</i>
400	Retail - Food and beverage stores	\$896,816	\$1,488,650
402	Retail - Gasoline stores	\$783,826	\$1,301,094
405	Retail - General merchandise stores	\$190,994	\$317,038
475	Offices of physicians	\$1,938,508	\$3,217,786
481	Other ambulatory health care services	\$129,122	\$214,334
482	Hospitals	\$4,706,754	\$7,812,878
499	Hotels and motels, including casino hotels	\$16,526,686	\$27,433,124
500	Other accommodations	\$16,526,686	\$27,433,124
501	Full-service restaurants	\$3,046,238	\$5,056,540
502	Limited-service restaurants	\$3,046,238	\$5,056,540
503	All other food and drinking places	\$3,046,238	\$5,056,540
511	Dry-cleaning and laundry services	\$1,115,258	\$1,851,250
Total		\$51,953,366	\$86,238,898

SOURCE: GSA, IMPLAN

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This spending pattern was then supplemented with additional medical expenditures that are not typical among tourists but might be necessary for workers, especially those on extended employment. The estimates for the medical expenditures (the Offices of Physicians, Other Ambulatory Health Care Services, and Hospitals sectors) were based on typical household spending patterns, using IMPLAN ratios, and were not based on estimates from Enbridge. Table 4 contains a complete list of the sectors used for modeling the impacts of non-local worker spending and the direct effects modeled in each sector as a result of non-local construction worker spending.

It should be noted that the total Direct Effects for the two projects (\$51.9 million for Sandpiper and \$86.2 million for Line 3) are less than the estimated total direct spending mentioned earlier (\$55.8 million and \$92.6 million, respectively). This is due to margining. Margins are applied when money is spent in a retail or wholesale sector, as only a small portion of that goes to the local retailer or wholesaler. The price of the goods sold is passed on to producers. All of the retail spending done by non-local construction workers is subject to margining, and therefore, the Direct Effects shown in Table 4 are slightly smaller than what was originally calculated.

III. Findings

This section provides the direct, indirect, and induced economic impacts of construction activities for the Sandpiper and Line 3 projects, measured in employment, output, and value added. A special sub-section of the findings covers the results from modeling non-local construction worker spending on local retail and hospitality industries. All results are shown in 2015 dollars.

Sandpiper Line

Table 5 summarizes the total economic effects from Sandpiper construction on the 15-county study area. These results use the direct expenditures provided by Enbridge as well as per diem spending by non-local construction workers as the original input for the model. The construction of the pipeline will generate a temporary increase in economic activity during the course of the construction project. Throughout the project, increased demand for equipment, labor, and transportation will lead to increased economic activity in the affected counties. After the completion of the project, this additional activity will cease, and the economic impacts will no longer be felt in that region.

Table 5. Total Sandpiper Line Impact Summary, by Year (in Millions of Dollars)

<i>Total Effects</i>	<i>Employment</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Year 1 (2017)	4,818	\$163.8	\$222.2	\$666.4
Year 2 (2018)	4,792	\$160.5	\$218.0	\$652.7
Project Total	4,805	\$324.3	\$440.2	\$1,319.1

SOURCE: IMPLAN, 2015

Table 5 shows the total economic impacts of the two-year Sandpiper Line construction project by year. While direct spending was distributed equally between the two years as shown in Table 1, there are

some slight differences between the two years' results due to inflation adjustments made by IMPLAN¹⁰. The left-most column of Table 5, labeled Employment, indicates the number of jobs that the Sandpiper construction project is estimated to support directly and indirectly. Employment estimates are in terms of jobs, not in terms of full-time equivalent employees. For construction projects, these jobs are typically short-term and temporary, meaning the effects will be felt during the project and will cease upon its completion. According to the results of this analysis, it is estimated that construction of the Sandpiper line will support approximately 4,800 jobs in the region during the two-year period, 1,410 of which are expected to be filled by construction workers from outside the study area¹¹. It should be noted that employment for the project represents the average of the two years, not the sum. Employment numbers cannot be summed because it is assumed that most of the jobs carry over from one year to the next and will be filled by the same individuals.

The second column, Labor Income, is an estimate of all employee compensation, including wages, benefits, and proprietor income. It is estimated that the Sandpiper line will contribute to over \$324 million in employee wages and benefits in the study area over the life of the project. Column three, labeled Value Added, shows the economic impacts of the expenditures that the Sandpiper line will put specifically towards wages, rents, interest, and profits related to its construction. Value Added represents the contribution to GDP made by an individual producer, industry, or sector. The Sandpiper line is estimated to have a total Value Added impact of more than \$440 million in the study area during the two-year period (2017-18). The last column, Output, is the value of all local production required to sustain activities. Enbridge expects to spend more than \$934 million within the study area over the course of the Sandpiper construction project (see Direct Effect Table 6), leading to a total output impact of \$1.3 billion regionally, in combined direct, indirect, and induced spending effects.

Table 6. Total Sandpiper Line Impact Detail (in Millions of Dollars)

<i>Impact Type</i>	<i>Employment</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct Effect	3,179	\$215.2	\$241.7	\$934.5
Indirect Effect	957	\$62.3	\$110.3	\$225.6
Induced Effect	669	\$46.8	\$88.2	\$159.0
Total Effect	4,805	\$324.3	\$440.2	\$1,319.1

SOURCE: IMPLAN, 2015

Further details for the total economic impacts of the two-year Sandpiper Line construction project are shown in Table 6. In this table, the Total Effects for the two-year project are broken out by impact type: Direct, Indirect, and Induced Effect. Direct employment and expenditures provided by Enbridge were combined with the direct effects of non-local construction workers' spending for a total direct effect in the study area of \$934.5 million in spending and 3,179 supported jobs. The Indirect Effect shows the measurement of increased spending between commercial, government, and service industries as a result of the direct effects (\$225.6 million in industry spending and 957 supported jobs). Induced Effect

¹⁰ For more detail, see the Deflators definition in Appendix B

¹¹ In IMPLAN modeling, employment is defined "at the site" so all employees hired for the project are considered part of direct employment, even though we know that some will be hired from outside the study area.

measures the amount of increased spending by residential households as a result of the direct effects (\$159.0 million in household spending and 669 supported jobs). Total Effect is the sum of Direct, Indirect, and Induced Effects.

Tables 7 and 8 show how construction and non-local worker spending contribute to the total impacts for the Sandpiper project. Table 7 includes detailed impacts for the Sandpiper construction spending, and Table 8 highlights the impacts of non-local worker spending. The majority of the impacts of the project will come from the company’s construction expenditures (Table 7), totaling \$882.5 million¹² in direct spending on site preparation, procurement, engineering, and environmental costs. To complete the project, Enbridge expects to directly employ 2,820 workers, half of whom are expected to be from within the study area. The construction will result in an estimated total payroll of \$332 million, of which \$196.6 million will go to local workers. As a result of local input purchases and the spending of labor income, the two-year construction project is expected to support more than 4,300 jobs in the study region and will lead to more than \$1.2 billion in new spending during the two-year period.

Table 7. Sandpiper Construction Impact Detail (in Millions of Dollars)

<i>Impact Type</i>	<i>Employment</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct Effect	2,820	\$196.6	\$212.9	\$882.5
Indirect Effect	904	\$58.4	\$103.2	\$211.2
Induced Effect	606	\$42.4	\$79.9	\$144.1
Total Effect	4,330	\$297.4	\$396.0	\$1,237.8

SOURCE: IMPLAN, 2015

Table 8. Sandpiper Non-Local Worker Spending Impact Detail (in Millions of Dollars)

<i>Impact Type</i>	<i>Employment</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct Effect	359	\$18.6	\$28.8	\$52.0
Indirect Effect	53	\$3.9	\$7.2	\$14.4
Induced Effect	63	\$4.4	\$8.3	\$14.9
Total Effect	474	\$26.9	\$44.2	\$81.3

SOURCE: IMPLAN, 2015

Spending by non-local workers will provide a smaller, but substantial, portion of the economic impacts from the Sandpiper project, as shown in Table 8. Using the per diem estimates provided by the GSA, the BBER research team estimated that non-local workers would spend approximately \$52 million over the course of the construction project. This new spending is expected to support nearly 500 jobs throughout the region and lead to more than \$80 million in combined direct, indirect, and induced spending.

¹² Enbridge’s procurement spending is subject to margining and is the reason that the total direct spending shown in Table 7 is slightly smaller than what was originally seen in Table 1. For more information on margins, see the explanation on page 10 and the “Margins” definition in Appendix B.

Table 9. Top Retail and Hospitality Sectors Impacted by Sandpiper Line Project, 2017-18

<i>Description</i>	<i>Direct</i>	<i>Indirect</i>	<i>Induced</i>	<i>Total</i>
Retail - Nonstore retailers	0	125	10	134
Other accommodations	129	0	1	130
Hotels and motels, including casino hotels	93	11	10	113
Full-service restaurants	33	17	39	89
Retail - Miscellaneous store retailers	0	72	10	82
Retail - Clothing and clothing accessories stores	0	73	5	78
Limited-service restaurants	28	6	33	66
Retail - General merchandise stores	1	38	22	61
Retail - Gasoline stores	6	38	7	52
Retail - Health and personal care stores	0	39	7	46
All other food and drinking places	20	7	17	44
Retail - Food and beverage stores	8	8	22	37
Retail - Building material and garden equipment and supplies stores	0	22	10	32
Retail - Sporting goods, hobby, musical instrument and book stores	0	19	5	24
Retail - Motor vehicle and parts dealers	0	13	9	22
Other amusement and recreation industries	0	2	5	7
Retail - Electronics and appliance stores	0	2	4	6
Promoters of performing arts and sports and agents for public figures	0	2	4	6
Performing arts companies	0	1	4	6
Retail - Furniture and home furnishings stores	0	3	3	6
Gambling industries (except casino hotels)	0	0	3	3
Fitness and recreational sports centers	0	1	1	2
Independent artists, writers, and performers	0	1	1	2
Commercial Sports Except Racing	0	1	1	2
Museums, historical sites, zoos, and parks	0	0	1	1
Bowling centers	0	0	1	1
Racing and Track Operation	0	0	1	1
Amusement parks and arcades	0	0	1	1
<i>Total</i>	<i>318</i>	<i>497</i>	<i>240</i>	<i>1054</i>

SOURCE: IMPLAN, 2015

Throughout the life of the project, it is expected that the Retail and Hospitality sectors in the region will experience an increase in economic activity, as a result of direct spending on the part of non-local workers as well as indirect and induced spending from the construction project itself. Table 9 shows all of the Retail and Hospitality sectors impacted by the project and the number of jobs supported in each as a result of the Sandpiper project. In total, it is expected that the project will support more than 1,000 jobs in Retail and Hospitality sectors during the two-year period. The Non-store Retailers sector is expected to see the largest employment gains as a result of the project, followed by the sectors of Other Accommodations (e.g. resorts, campgrounds, RV parks), Hotels and Motels, and Full-Service Restaurants.

Line 3 Replacement

These findings summarize the effects of the Line 3 replacement project on the Northern Minnesota study area. Like any construction project, the replacement of Line 3 will generate a temporary increase in economic activity during the course of the construction project. Throughout the project, increased demand for equipment, labor, and transportation will lead to increased economic activity in the affected counties. After the completion of the project, this additional activity will cease, and the economic impacts will no longer be felt in the region.

Table 10. Total Line 3 Replacement Impact Summary, by Year (in Millions of Dollars)

Total Effects	Employment	Labor Income	Value Added	Output
Year 1 (2017)	7,727	\$243.1	\$334.7	\$1,013.2
Year 2 (2018)	7,689	\$238.3	\$328.4	\$992.4
Project Total	7,708	\$481.3	\$663.1	\$2,005.6

SOURCE: IMPLAN, 2015

Table 10 shows the total economic impacts of the two-year Line 3 replacement project by year. While direct spending was distributed equally between the two years as shown in Table 2, there are some slight differences in results due to inflation adjustments made by IMPLAN¹³. The Line 3 replacement project is estimated to support, directly and indirectly, approximately 7,700 jobs over the two-year period, 2,340 of which are expected to be filled by construction workers from outside the study area¹⁴. It should be noted that employment for the project represents the average of the two years, not the sum. Employment numbers cannot be summed because it is assumed that most of the jobs carry over from one year to the next and will be filled by the same individuals.

In addition, the project is expected to contribute to over \$480 million in employee wages and benefits (Labor Income) and more than \$660 million in combined wages, rents, interest, and profits (Value Added). In total, Enbridge expects to spend more than \$1.4 billion within the study area during the Line 3 replacement project (see Direct Effect Table 11), leading to a total output impact of \$2.0 billion regionally in combined direct, indirect, and induced spending effects.

Table 11. Total Line 3 Replacement Impact Detail (in Millions of Dollars)

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	5,277	\$318.5	\$365.9	\$1,428.8
Indirect Effect	1,444	\$93.8	\$167.1	\$342.3
Induced Effect	987	\$69.0	\$130.0	\$234.5
Total Effect	7,708	\$481.3	\$663.1	\$2,005.6

SOURCE: IMPLAN, 2015

¹³ For more detail, see the Deflators definition in Appendix B

¹⁴ In IMPLAN modeling, employment is defined “at the site” so all employees hired for the project are considered part of direct employment, even though we know that some will be hired from outside the study area.

Further details of the Line 3 replacement impacts are shown in Table 11. In this table, the Total Effects for the two-year project are broken out by impact type: Direct, Indirect, and Induced Effect. Direct employment and expenditures provided by Enbridge were combined with the Direct Effects of non-local construction workers' spending for a Total Direct Effect in the study area of \$1.4 billion in spending and 5,277 supported jobs. The Indirect Effect shows the measurement of increased spending between commercial, government, and service industries as a result of the direct effects (\$342.3 million in industry spending and 1,444 supported jobs). Induced Effect measures the amount of increased spending by residential households as a result of the direct effects (\$234.5 million in household spending and 987 supported jobs). Total Effect is the sum of Direct, Indirect, and Induced Effects.

Tables 12 and 13 show how construction and non-local worker spending contribute to the total impacts for the Line 3 replacement project. Table 12 includes detailed impacts for the Line 3 construction spending, and Table 13 highlights the impacts of non-local worker spending. It is estimated that construction spending (including site preparation, procurement, engineering, and environmental costs) will directly employ 4,681 workers, half of which are expected to be from within the study area. The construction will result in an estimated total payroll of \$492 million, of which \$287.6 million will go to local workers. As a result of local input purchases and the spending of labor income, the two-year construction project is expected to support more than 6,900 jobs in the region and will lead to more than \$1.8 billion in new spending during the two-year period (see Table 12).

Table 12. Line 3 Construction Impact Detail (in Millions of Dollars)

<i>Impact Type</i>	<i>Employment</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct Effect	4,681	\$287.6	\$318.1	\$1,342.5
Indirect Effect	1,357	\$87.4	\$155.2	\$318.3
Induced Effect	883	\$61.7	\$116.3	\$209.7
Total Effect	6,921	\$436.7	\$589.7	\$1,870.6

SOURCE: IMPLAN, 2015

Table 13. Line 3 Non-Local Worker Spending Impact Detail (in Millions of Dollars)

<i>Impact Type</i>	<i>Employment</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct Effect	596	\$30.9	\$47.8	\$86.2
Indirect Effect	87	\$6.4	\$11.9	\$23.9
Induced Effect	104	\$7.3	\$13.8	\$24.8
Total Effect	787	\$44.6	\$73.4	\$135.0

SOURCE: IMPLAN, 2015

Spending by non-local workers will also provide an injection of new spending to the region, as shown in Table 13. Using the per diem estimates provided by the GSA, the BBER research team estimated that non-local workers would spend upwards of \$86 million over the course of the construction project. This new spending is expected to support nearly 800 jobs throughout the region and lead to about \$135 million in combined direct, indirect, and induced spending.

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Throughout the life of the project, it is expected that the Retail and Hospitality sectors in the region will experience an increase in economic activity as a result of direct spending on the part of non-local workers as well as indirect and induced spending from the construction project itself. Table 14 shows all of the Retail and Hospitality sectors impacted by the project and the number of jobs supported in each as a result of the Line 3 project. In total, it is expected that the project will support more than 1,600 jobs in Retail and Hospitality sectors during the two-year period. Other Accommodations (e.g. resorts, campgrounds, RV parks) are expected to see the largest employment gains as a result of the project, followed by Non-store Retailers, Hotels and Motels, and Full-service Restaurants.

Table 14. Top Retail and Hospitality Sectors Impacted by Line 3 Replacement, 2017-18

<i>Description</i>	<i>Direct</i>	<i>Indirect</i>	<i>Induced</i>	<i>Total</i>
Other accommodations	214	0	1	215
Retail – Non-store retailers	0	194	15	208
Hotels and motels, including casino hotels	154	16	14	184
Full-service restaurants	54	22	58	134
Retail - Miscellaneous store retailers	0	112	15	127
Retail - Clothing and clothing accessories stores	0	113	8	121
Limited-service restaurants	46	8	49	102
Retail - General merchandise stores	2	59	32	93
Retail - Gasoline stores	11	60	11	81
Retail - Health and personal care stores	0	60	11	71
All other food and drinking places	34	10	25	69
Retail - Food and beverage stores	12	12	33	57
Retail - Building material and garden equipment and supplies stores	0	33	15	49
Retail - Sporting goods, hobby, musical instrument and book stores	0	29	8	37
Retail - Motor vehicle and parts dealers	0	20	13	33
Other amusement and recreation industries	0	3	8	10
Retail - Electronics and appliance stores	0	3	7	9
Retail - Furniture and home furnishings stores	0	4	5	9
Promoters of performing arts and sports and agents for public figures	0	3	6	9
Performing arts companies	0	2	7	9
Gambling industries (except casino hotels)	0	0	5	5
Fitness and recreational sports centers	0	1	2	3
Independent artists, writers, and performers	0	2	1	2
Commercial Sports Except Racing	0	1	1	2
Museums, historical sites, zoos, and parks	0	0	2	2
Bowling centers	0	0	2	2
Amusement parks and arcades	0	0	1	1
Racing and Track Operation	0	0	1	1
<i>Total</i>	<i>527</i>	<i>765</i>	<i>353</i>	<i>1645</i>

SOURCE: IMPLAN, 2015

IV. Conclusions

The proposed Sandpiper and Line 3 construction projects represent a potentially large, and temporary, increase in economic activity in the 15-county study area of northern Minnesota. Both proposed projects would support thousands of jobs, many of which would be felt as direct employment in the construction, engineering, and wholesale trade industries. In addition, Retail and Hospitality sectors would see a sizable increase in economic activity as a result of the proposed construction projects. This study estimates that, for both projects, more than 1,000 jobs would be supported in the Retail and Hospitality sectors were the construction to occur.

Sandpiper Line

According to the results of this analysis, it is estimated that construction of the Sandpiper line will support approximately 4,800 jobs in the region during the two-year period, 1,410 of which are expected to be filled by construction workers from outside the study area¹⁵. Enbridge expects to spend more than \$934 million within the study area over the course of the Sandpiper construction project – leading to a total output impact of \$1.3 billion regionally in combined direct, indirect, and induced spending effects.

The majority of the impacts of the project will come from the company’s construction expenditures, including site preparation, procurement, engineering, and environmental costs. Enbridge expects to directly employ 2,820 workers as part of the two-year project, half of which are expected to be from within the study area. The construction project will result in an estimated total payroll of \$332 million, of which approximately \$196 million will go to local workers. As a result of local input purchases and the spending of local labor income, the two-year construction project is expected to support more than 4,300 jobs in the region and will lead to more than \$1.2 billion in new spending during the two-year period.

A smaller, but still significant, impact of the project will come from spending on the part of the non-local workforce that will be brought in for the project. According to Enbridge representatives, approximately half of the 2,820 workers required for the construction of the pipeline will be sourced from outside of the study area. These workers will spend some portion of their income on lodging, restaurants, and other incidental expenses. The BBER research team estimated that non-local workers would spend approximately \$52 million over the course of the construction project. This new spending is expected to support nearly 500 jobs throughout the region and lead to more than \$80 million in combined direct, indirect, and induced spending.

Of special interest for this analysis was the impact of the Sandpiper Line construction on Retail and Hospitality sectors in the study area. In total, it is expected that the project will support more than 1,000 jobs in Retail and Hospitality during the two-year period. The sector of Non-store Retailers is expected to see the largest employment gains as a result of the project, followed by Other Accommodations (e.g. resorts, campgrounds, RV parks), Hotels and Motels, and Full-Service Restaurants.

¹⁵ In IMPLAN modeling, employment is defined “at the site” so all employees hired for the project are considered part of direct employment, even though we know that some will be hired from outside the study area.

Line 3 Replacement

The Line 3 replacement project is estimated to support, directly and indirectly, approximately 7,700 jobs over the two-year period, 2,340 of which are expected to be filled by construction workers from outside the study area¹⁶. In total, Enbridge is expected to spend more than \$1.4 billion within the study area during the Line 3 replacement project, leading to a total output impact of \$2.0 billion regionally, in combined direct, indirect and induced spending effects.

Like the Sandpiper Line, the bulk of the economic impacts from the project will come from the company's construction expenditures, including site preparation, procurement, engineering, and environmental costs. It is estimated that project will directly employ 4,681 workers, half of which are expected to be from within the study area. The construction will result in an estimated total payroll of \$492 million, of which \$287.6 million will go to local workers. As a result of local input purchases and the spending of labor income, the two-year construction project is expected to support more than 6,900 jobs in the region and will lead to more than \$1.8 billion in new spending during the two-year period.

Spending by non-local workers will also provide an injection of new spending to the region. The BBER research team estimated that non-local workers would spend upwards of \$86 million over the course of the construction project. This new spending is expected to support nearly 800 jobs throughout the region and lead to about \$135 million in combined direct, indirect, and induced spending.

It is expected that the Retail and Hospitality sectors in the region will experience an increase in economic activity as a result of direct spending on the part of non-local workers as well as indirect and induced spending from the construction project itself. In total, it is expected that the project will support more than 1,600 jobs in Retail and Hospitality sectors during the two-year period. Other Accommodations (e.g. resorts, campgrounds, RV parks) are expected to see the largest employment gains as a result of the project, followed by Non-store Retailers, Hotels and Motels, and Full-service Restaurants.

NOTE - Readers are encouraged to remember the UMD Labovitz School's BBER was asked to supply an economic impact analysis only. This analysis does not consider the social or environmental impacts of the project and should not be viewed as a cost benefit analysis or environmental impact assessment. Any subsequent policy recommendations should be based on the "big picture" of total impact.

¹⁶ In IMPLAN modeling, employment is defined "at the site" so all employees hired for the project are considered part of direct employment, even though we know that some will be hired from outside the study area.

Appendix A: Model Assumptions

Construction Activity

1. The IMPLAN industries selected for sectoring these impact activities are:

Sector	Description
58	Construction of other new nonresidential structures
395	Wholesale trade
449	Architectural, engineering, and related services
455	Environmental and other technical consulting services

SOURCE: IMPLAN, 2015

2. Land acquisition costs, or easements, were not included in the analysis.
3. Construction years are assumed to be 2017 and 2018 for both projects (Sandpiper and Line 3).
4. It is assumed that half of the required workforce for both projects (Sandpiper and Line 3) will live within the study area. This equates to 1,410 local workers for the Sandpiper project and 2,341 local workers for the Line 3 replacement project. Therefore, labor income was reduced by approximately half to reflect the local employee compensation, using the following equation:
 Local Employee Compensation = Total Employee Compensation * [(1- expected commuting rate)/(1- typical commuting rate)]
5. Sandpiper construction costs are estimated to be \$1.3 billion in total, distributed as follows.

Budget item	Total Spending	% Spent in Study Area	Direct Spending in Study Area	Year 1 (2017)	Year 2 (2018)
Site preparation-Construction	\$640.9	100%	\$640.9	\$320.5	\$320.5
Site preparation – Project management	\$242.8	100%	\$242.8	\$121.4	\$121.4
Procurement	\$286.6	10%	\$28.7	\$14.3	\$14.3
Engineering	\$39.6	90%	\$35.6	\$17.8	\$17.8
Environment	\$54.6	23%	\$12.7	\$6.4	\$6.4
Total Costs	\$1,264.5		\$960.7	\$480.3	\$480.3

SOURCE: ENBRIDGE, IMPLAN, 2015

6. Line 3 construction costs are estimated to be \$1.9 billion in total, distributed as follows:

Budget item	Total Spending	% Spent in Study Area	Direct Spending in Study Area	Year 1 (2017)	Year 2 (2018)
Site preparation-Construction	\$998.7	100%	\$998.7	\$499.4	\$499.4
Site preparation – Project management	\$376.8	100%	\$376.8	\$188.4	\$188.4
Procurement	\$445.4	10%	\$44.5	\$22.3	\$22.3
Engineering	\$34.7	90%	\$31.3	\$15.6	\$15.6
Environment	\$47.1	23%	\$11.0	\$5.5	\$5.5
Total Costs	\$1,902.9		\$1,462.3	\$731.2	\$731.2

SOURCE: ENBRIDGE, IMPLAN, 2015

- For purposes of modeling, it was assumed that the construction budgets for both projects would be mutually exclusive and that there would be no overlap in spending between the two projects, should they both occur.

Non-Local Worker Spending

- Non-local construction worker spending estimates were calculated using FY2016 Per Diem Standard Rates for Minnesota, provided by the General Service Administration (GSA)¹⁷. The rates are \$89 for lodging expenses and \$51 for meals and incidentals, with 75% meals and incidentals on the first and last travel days (e.g. Monday and Friday).
- For each worker, we assume a 1.3 year length of employment and a five-day work week. Therefore, per-diem spending per non-local worker is estimated to be \$585.50 per worker per week, or \$39,580 per worker for the life of each project.
- It is assumed that half of the required workforce for both projects (Sandpiper and Line 3) will come from outside the study area. This equates to 1,410 non-local workers for the Sandpiper project and 2,340 non-local workers for the Line 3 replacement project.
- Non-local construction worker spending includes lodging, meals, and "incidentals" (gas, laundry, some retail). In addition, it is assumed that some personal expenses will go to medical costs. All other worker income will leave the region. The IMPLAN industries used for modeling these impacts and the direct effects for both projects are shown below.

<i>Sector</i>	<i>Description</i>	<i>Direct Effects Line 3</i>	<i>Direct Effects Sandpiper</i>
400	Retail - Food and beverage stores	\$1,488,650	\$896,816
402	Retail - Gasoline stores	\$1,301,094	\$783,826
405	Retail - General merchandise stores	\$317,038	\$190,994
475	Offices of physicians	\$3,217,786	\$1,938,508
481	Other ambulatory health care services	\$214,334	\$129,122
482	Hospitals	\$7,812,878	\$4,706,754
499	Hotels and motels, including casino hotels	\$27,433,124	\$16,526,686
500	Other accommodations	\$27,433,124	\$16,526,686
501	Full-service restaurants	\$5,056,540	\$3,046,238
502	Limited-service restaurants	\$5,056,540	\$3,046,238
503	All other food and drinking places	\$5,056,540	\$3,046,238
511	Dry-cleaning and laundry services	\$1,851,250	\$1,115,258
Total		\$86,238,898	\$51,953,366

SOURCE: GSA, ENBRIDGE, IMPLAN, 2015

¹⁷ <http://www.gsa.gov/portal/category/100120>

Appendix B. Economic Impact Procedures and Data Sources

Input/Output Analysis

Input/Output analysis is a type of applied economic analysis that tracks the interdependence among various producing and consuming sectors of an economy¹⁸. Specifically, it depicts inter-industry relations and shows how each industry is dependent on all the others in the economy, both as a consumer of outputs and as a supplier of inputs. Input/Output analysis has been used to study regional economies within a nation and as a tool for national and regional economic planning. It predicts the effect of changes in one industry on the others and on consumers, government, and suppliers. In addition, a common use of input/output analysis is to estimate the economic impacts of an organization or event. It is this technique that is implemented in this study.

This study uses the IMPLAN Group's input/output modeling data and software (IMPLAN version 3.1). The IMPLAN database contains county, state, zip code, and federal economic statistics, which are specialized by region, not estimated from national averages. Using classic input/output analysis in combination with regional-specific Social Accounting Matrices and Multiplier Models, IMPLAN provides a highly accurate and adaptable model for its users.

IMPLAN Data and Assumptions

IMPLAN data files use the following federal government data sources.

- US Bureau of Economic Analysis Benchmark Input/Output Accounts of the US
- US Bureau of Economic Analysis Output Estimates
- US Bureau of Economic Analysis Regional Economic Information Systems (REIS) Program
- US Bureau of Labor Statistics Covered Employment and Wages (CEW) Program
- US Bureau of Labor Statistics Consumer Expenditure Survey
- US Census Bureau County Business Patterns
- US Census Bureau Decennial Census and Population Surveys
- US Census Bureau Economic Censuses and Surveys
- US Department of Agriculture Census

IMPLAN data files consist of the following components: employment, industry output, value added, institutional demands, national structural matrices, and inter-institutional transfers.

The data used was the most recent IMPLAN data available, which is for the year 2013. All data are reported in 2015 dollars.

Economic impacts are made up of direct, indirect, and induced impacts. The following are suggested assumptions for accepting the impact model: IMPLAN input/output is a production-based model, and employment numbers (from U.S. Department of Commerce secondary data) treat both full- and part-time individuals as being employed.

¹⁸ Bureau of Economic Analysis (www.bea.gov/glossary/glossary)

Regional data for the impact models for Value Added, Employment, and Output are supplied by IMPLAN for this impact. Employment assumptions were provided to the model to enable construction of the impact model. From these data, Social Accounts, Production, Absorption, and Byproducts information were generated from the national level data and was incorporated into the model. All region study definitions and impact model assumptions were agreed on before work with the models began.

Modeling Issues

There are some IMPLAN modeling issues that should be considered when interpreting the results of this study.

A study area that is actually part of a larger functional economic region will likely miss some important backward linkages. For example, linkages with the labor force may be missing. Workers who live and spend outside the study area may actually hold local jobs.

Regional indirect and induced effects are driven by assumptions in the model. With some models, one problem is that the assumptions can mask the true multiplier. This is especially true of the assumption of constant returns to scale. This assumption most affects induced effects and says that, for example, if I drink coffee, and my income increases, I will drink proportionally more coffee than before. The amount of weight placed on the induced effects (the percentage of the total induced effect you would want to use) can be further analyzed with an in-depth impact study, involving much more specific data collection and more detailed analysis, but that is beyond the scope of this analysis.

Finally, and most importantly, the relationship of Output to Employment has been set for the model by data provided by Enbridge to the BBER based on the best estimates of engineers and managers involved in each project. It can be noted that, for purposes of research and with more resources, the modeling methodology can be driven by data collected from surveys and post-construction values. This survey data can provide greater accuracy in regional impact assessments for the linkage between core and peripheral labor market areas and deliver better estimates of local vs. regional purchases.

Definitions used in this report

Backward Linkages: The interconnection of an industry to other industries from which it purchases its inputs in order to produce its output. It is measured as the proportion of intermediate consumption to the total output of the sector (direct backward linkage) or to the total output multiplier (total backward linkage). An industry has significant backward linkages when its production of output requires substantial intermediate inputs from many other industries¹⁹.

Deflators: The Output Deflator converts the industry Sales value to the year of the dataset, Output Deflators are specific to each industry, You can see the deflator values in the Setup Activities screen when the Event Year field is displayed (Event Options> Show> Event Year). These are just inflationary costs. The source for the Output Deflators comes from the BLS Employment projections.

Direct Effect: Initial new spending in the study area resulting from the project.

¹⁹ IMPLAN, 2015

Employment: Estimates (from U.S. Department of Commerce secondary data) are in terms of jobs, not in terms of full-time equivalent employees. Therefore, these jobs may be temporary, part-time, or short-term jobs.

Gross Output: The value of local production required to sustain activities.

Indirect Effect: The additional inter-industry spending from the direct impact.

Induced Effect: The impact of additional household expenditures resulting from the direct and indirect impact.

Labor Income: All forms of employment income, including employee compensation (wages and benefits) and proprietor income.

Leakages: Any payments made to imports or value added sectors that do not in turn re-spend the dollars within the region.

Margins: The value of the wholesale and retail trade services provided in delivering commodities from producers' establishments to purchasers. Margin is calculated as sales receipts less the cost of the goods sold. It consists of the trade margin plus sales taxes and excise taxes that are collected by the trade establishment. (BEA)

Multipliers: Total production requirements within the Study Area for every unit of production sold to Final Demand. Total production will vary depending on whether Induced Effects are included and the method of inclusion. Multipliers may be constructed for output, employment, and every component of Value Added.

Value Added: A measure of the impacting industry's contribution to the local community; it includes wages, rents, interest, and profits.