

Appendix 23 – MCE Project Economic Report

Update & Enhance Summit Carbon Solutions Economic Impact Report

November 2024

Prepared For:



**SUMMIT CARBON
SOLUTIONS**

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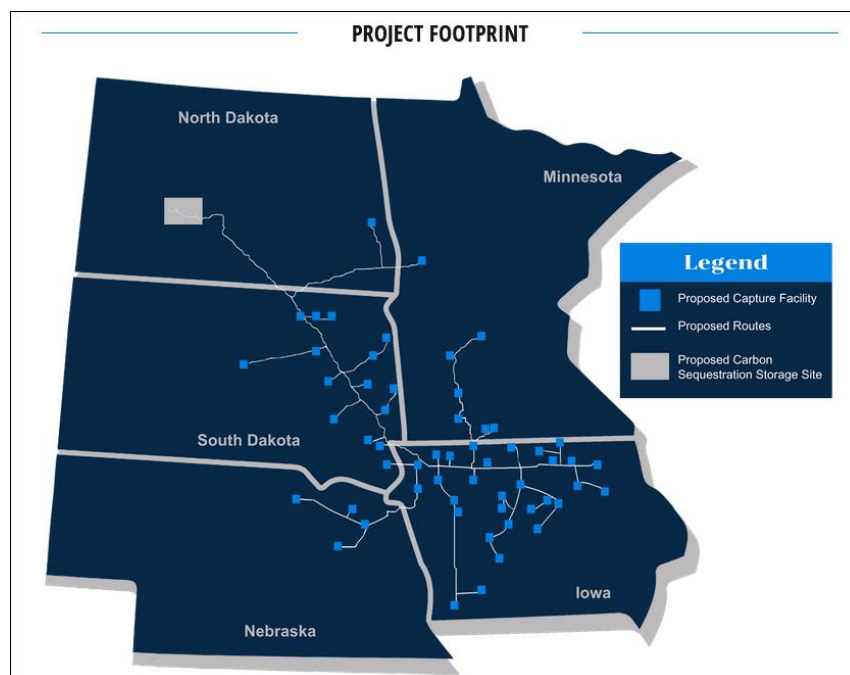
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1 Executive Summary

The Inflation Reduction Act of 2022 enhanced the tax credits provided by Section 45Q of the tax code and initiated a new set of tax credits in Section 45Z that have the potential to stimulate carbon-reducing activities all along the supply chain of renewable fuels and greatly enhance the role of carbon capture and sequestration in the effort to reduce the CI scores of ethanol and other advanced biofuels such as Sustainable Aviation Fuel (SAF).

Capturing and storing carbon dioxide permanently in underground wells has the potential to become the most consequential technological deployment in the history of the broader biofuels industry. Deploying effective carbon capture and storage at biofuels plants (or at distant subterranean wells via pipeline) will enable Upper Midwestern ethanol plants to continue to provide not only ethanol for passenger vehicles but also enable a logical pathway for expanding opportunities into Sustainable Aviation Fuel (SAF) through the use of Ethanol-to-Jet (ETJ) technology.

Summit Carbon Solutions’ proposed carbon capture and sequestration system is situated such that a large number of ethanol plants will have the ability to capture financial benefits from tax credits authorized in Section 45 of the U.S. Code, which is expected to drive significant economic activity in the broader economy. To quantify this impact, Summit has retained the Decision Innovations Solutions (DIS) team to provide an estimate of the total economic impact of the proposed carbon capture and sequestration system on the state and regional economy, as shown in the following figure.



Results from this analysis are presented first as a total region (Section 5) and then as individual states comprising the regional total (see Section 6 for state level results for Iowa, South Dakota, North Dakota, Nebraska and Minnesota). Results in this Executive Summary, as well as in the results sections (Section 4 and Section 5) are expressed using the following economic indicators:

- Output:** The broadest measure of economic activity – also commonly referred to as “sales.” Output refers to the total value of all sales of an

industry within a study area without any deductions for the cost or origination of inputs that were used in the production process.

- **Value Added:** A component of output, this measure includes the total sales minus the costs of inputs. Alternatively, value added is calculated as the sum of labor income (further defined below), taxes on production and imports, and other property-type income. An entity’s value added is equivalent to its contribution to GDP.
- **Labor Income:** A subset of value added, includes the sum of employee compensation (i.e., wages and benefits) and proprietor income (i.e., income of self-employed workers).
- **Employment (Jobs):** A measure of part- and full-time job positions, including contract workers, without regard to their full-time equivalence. Since it is not representative solely of full-time positions or full-time equivalents, care must be made when drawing comparisons to other measures of employment. Note that for the construction impacts shown throughout this report, employment values are shown as the average number of jobs per year that will be supported throughout the (7-year) construction period.

Regional Economic Impacts: CONSTRUCTION

At a regional level, the tables below show the economic impact from implementing construction plans associated with the Summit project, which are significant. For example:

- Total employment impacts are estimated to be **4,391 jobs**, which results in **\$2.066 billion in labor income**
- Total **value-added** from the project is estimated to be **\$2.961 billion** while **total output** impacts are estimated to be **\$5.808 billion**
- Taxes generated at all jurisdiction levels from constructing the Summit project are also significant, amounting to an estimated **\$752.4 million**

Construction Economic Impacts				
Impact Type	Average Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)
Direct	175	\$ 184.1	\$ 193.5	\$ 467.2
Indirect	3,204	\$ 1,501.7	\$ 2,070.4	\$ 4,111.8
Induced	1,011	\$ 380.4	\$ 696.8	\$ 1,229.0
Total	4,391	\$ 2,066.1	\$ 2,960.7	\$ 5,808.1

Construction Tax Impacts			
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)
Direct	\$ 9.1	\$ 37.0	\$ 46.1
Indirect	\$ 232.2	\$ 322.7	\$ 555.0
Induced	\$ 61.5	\$ 89.9	\$ 151.3
Total	\$ 302.8	\$ 449.6	\$ 752.4

Regional Economic Impacts: OPERATIONS

While certainly significant, the economic impacts from constructing the carbon capture and sequestration system are temporary. The economic impacts from operating the carbon capture and sequestration system represent economic activity that is initially created and then supported in all years the system is in operation. Consider the following ongoing economic impacts associated with the carbon capture and sequestration system:

- **201 direct jobs** are associated with operating the project. These jobs then support another **1,065 jobs (1,266 total jobs)**
 - For every direct job initially created and then supported by operating the project, another 5.30 jobs are estimated to be initially created and then supported each year the project is in operation
- Total **value added** from operating the project is estimated to be **\$467.1 million**, of which **\$122.4 million** is received as **labor income**
- **Total output** impacts are estimated to be **\$1.039 billion**
- Taxes generated at all jurisdiction levels from operating the project are also significant, amounting to an estimated **\$205.9 million**

Operations Economic Impacts				
Impact Type	Average Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)
Direct	201	\$ 37.7	\$ 245.2	\$ 583.1
Indirect	654	\$ 62.4	\$ 181.2	\$ 383.8
Induced	412	\$ 22.3	\$ 40.7	\$ 71.8
Total	1,266	\$ 122.4	\$ 467.1	\$ 1,038.7

Operations Tax Impacts			
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)
Direct	\$ 138.4	\$ 12.6	\$ 151.0
Indirect	\$ 28.5	\$ 17.5	\$ 46.0
Induced	\$ 3.6	\$ 5.3	\$ 8.9
Total	\$ 170.5	\$ 35.4	\$ 205.9

2 Background

Capturing and storing carbon dioxide permanently in underground wells has the potential to become the most consequential technological deployment in the history of the broader biofuels industry. Deploying effective carbon capture and storage at biofuels plants (or at distant subterranean wells via pipeline) will enable Upper Midwestern ethanol plants to continue to provide not only ethanol for passenger vehicles but also enable a logical pathway for expanding opportunities into Sustainable Aviation Fuel (SAF) through the use of Ethanol-to-Jet (ETJ) technology.

In a [report commissioned by Summit Carbon Solutions](#) (Summit) in 2022, it was estimated at that time (based upon 1,958 pipeline miles) that the capital expenditure (construction) aspects of the project would provide for a \$6.7 billion total (direct, indirect and induced) economic impact, \$2.2 billion in labor income and an annual average of 11,427 jobs. From an operations standpoint, the project was estimated to provide for a \$419 million total (direct, indirect and induced) economic impact, \$101 million in labor income and an annual average of 1,170 jobs from annual operation of the project.

Given two years have passed since the original study was completed, some rather significant changes have taken place, namely: 1) the number of ethanol plants subscribed to delivering CO₂ to the Summit pipeline has increased; and 2) capital expenditure estimates have firmed. In light of these developments, Summit has requested that the Decision Innovations Solutions (DIS) Team provide an updated and enhanced estimate of the economic impact of the Summit CCUS (Carbon Capture, Utilization and Storage) project on the region's economy. This report seeks to serve this purpose.

3 Introduction

The Inflation Reduction Act enhanced the tax credits provided by Section 45Q of the tax code and initiated a new set of tax credits in Section 45Z that have the potential to stimulate carbon-reducing activities all along the supply chain of renewable fuels and greatly enhance the role of carbon capture and sequestration in the effort to reduce the CI scores of ethanol and other advanced biofuels such as Sustainable Aviation Fuel (SAF).

First introduced in 2008, Section 45Q of the United States Internal Revenue Code provides a tax credit for CO₂ permanent geologic storage. The policy is intended to incentivize deployment of carbon capture, utilization and permanent geologic storage, and a variety of project types are eligible. Under Section 45Q, captured carbon dioxide must be either stored underground in secure geologic formations, used for carbon dioxide-enhanced oil recovery or utilized in other projects that permanently sequester carbon dioxide.

The 2022 changes to 45Q provide up to \$85 per metric ton (subject to compliance with Prevailing Wage and Apprenticeship requirements) of CO₂ permanently sequestered in secure geological storage. The IRA legislation also reduced the capacity requirements for eligible projects: 18,750 metric tons per year for power plants (provided at least 75% of the CO₂ is captured), 12,000 metric tons per year for other facilities, and 1,000 metric tons per year for Direct Air Capture (DAC) facilities. Finally, the 2022 changes include a seven-year extension to qualify for the tax credit, with that extension now applicable through 2033.

In Part 2 of Subtitle D of the Inflation Reduction Act, tax credits for clean fuel production are contained in section 45Z. This credit applies to clean fuels produced after 2024 and generally sold before 2028. It is a new general business credit for clean transportation fuel that is produced at a qualifying facility and sells for qualifying purposes. These fuels must meet certain emissions standards. For transportation fuel produced at a qualified facility, the credit-per-gallon base amount is \$0.20 (non-aviation fuel), and the credit amount increases to \$1.00 per gallon (non-aviation fuel) if prevailing wage and apprenticeship requirements are met. The 45Z tax credits are based on the fuel’s carbon intensity (CI) score (kgCO₂e/MMBtu). Fuels with a CI score less than 50 (kgCO₂e/MMBtu) are eligible for the credit with the credit potential increasing as the CI score declines toward zero. Each CI point reduction of the transportation fuel below 50 (kgCO₂e/MMBtu) generates 2 cents per gallon. Qualified Facilities that elect to claim 45Z are ineligible from also claiming tax credits under Sections 45Q, 45X, or 48 (Investment Tax Credit for clean hydrogen production facilities) in the same calendar year.

Currently, most of the corn-starch-based ethanol production in Summit’s footprint has an average CI score of 55-65 (kgCO₂e/MMBtu), utilizing the Argonne National Laboratories GREET Model (ANL GREET). There are a number of production techniques and methodologies that can be implemented to incrementally reduce the carbon intensity of ethanol production, but the use of CCUS is the one of the most effective means of reducing the carbon intensity of ethanol production from corn with the implementation of CCUS estimated to typically reduce the CI score of an ethanol facility by approximately 30 CI points¹. In addition to the changes to the processes at the ethanol plants, there are changes to the on-farm production practices that corn producers can implement which can also reduce the CI score of ethanol

In this report, DIS has quantified what the states included in the Summit footprint can potentially gain through adoption of the latest technology with regards to carbon capture and sequestration via pipeline (CCSvP). Figure 1 shows the ethanol plants that are planning on being a part of the Summit CO₂ pipeline and sequestration project.

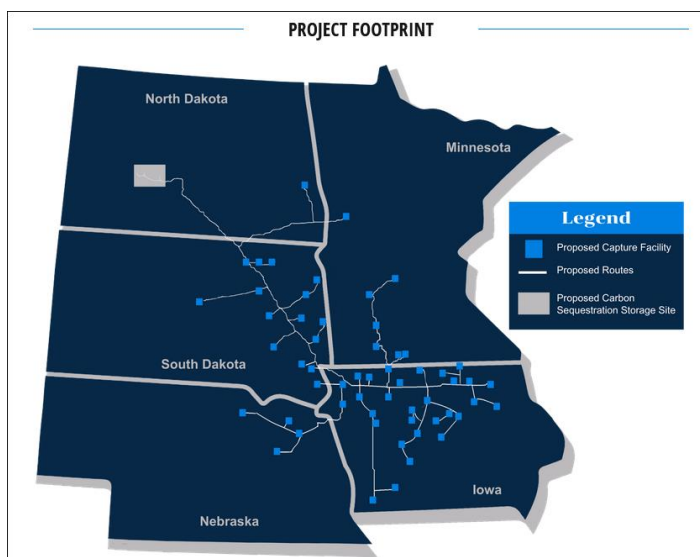


Figure 1. Summit Project Footprint

¹ Hui Xu, Uisung Lee, and Michael Wang. Life-cycle greenhouse gas emissions reduction potential for corn ethanol refining in the USA, <https://doi.org/10.1002/bbb.2348>

4 Methodology

In general, inputs used in the IMPLAN economic models created for this analysis were primarily derived from the construction and operation budgets provided by Summit, along with direct communication with their team. As appropriate, these budgets were further broken down into major elements of the project: Capture, Transportation (i.e., Pipeline), Sequestration and Project Management.

After working with Summit to estimate the capital and operational aspects of the project, the items within these budgets were mapped to appropriate IMPLAN industries and commodities to estimate the indirect and induced impacts of constructing and operating the capture, pipeline and sequestration system. In addition to the regional (5-state) model, the following state-level models were used for both the construction and operations impacts: North Dakota, South Dakota, Nebraska, Minnesota and Iowa.

4.1 Economic Impact Methodology

The following economic contribution study was conducted using a combination of IMPLAN and Microsoft Excel. IMPLAN is an input-output model used to understand industry relationships and conduct economic assessments for specified local economies. IMPLAN datasets are constructed annually and are derived from many different sources, including the U.S. Bureau of Labor Statistics (BLS), the U.S. Bureau of Economic Analysis (BEA), the U.S. Bureau of Economic Analysis Benchmark Input-Output Account of the U.S., the BEA output estimates, the U.S. Census Bureau's economic censuses and surveys, the U.S. Department of Agriculture's census, and more.

Due to its long history and acceptance, our preferred modeling software is the IMPLAN modeling system. In order to adequately satisfy project requirements, we have adopted rigorous, industry-standard economic impact methodology that will withstand anticipated critique by those not supportive of, or unfamiliar with, the Summit project.

4.1.1 IMPLAN Modeling Steps

This project required us to perform the following steps:

- 1) **Purchase appropriate IMPLAN data** for use in the IMPLAN economic impact modeling software.
 - a. The data needed for IMPLAN has been validated and the default data in IMPLAN has been checked to make sure it is appropriate for this analysis.
- 2) **Define Study Areas**
 - a. North Dakota
 - b. South Dakota
 - c. Nebraska
 - d. Minnesota
 - e. Iowa
 - f. 5-state Region (North Dakota, South Dakota, Nebraska, Minnesota and Iowa)
- 3) **Create an IMPLAN Model for the Study Area(s)**
 - a. Using the most current IMPLAN modeling framework (summer 2024), all six models for this analysis utilized purchased 2022 IMPLAN data.
- 4) **Run the Models to Generate Results**

- a. The IMPLAN model has been used to estimate the economic impact of the construction and annual average ongoing operations of the project in terms of employment (jobs), value-added, output (sales), household income and taxes.
- 5) **Capture, summarize, and report on results** from completed economic impact studies in the form of a written report and associated visuals
- 6) **Summarize Data for Inclusion in Final Report(s)**
 - a. With the types of final deliverables in mind, we have created a series of documents (images, graphs, maps, etc.) that are included in this report.

4.1.2 Presentation of Results

Within IMPLAN, the effects of an economic impact or contribution event are expressed in terms of direct, indirect, and induced effects. These different effect types are defined as follows:

- **Direct Effects** – The economic activity directly attributable to the industry or event under analysis; in this study, the activities of Summit during the construction and operations of the project.
- **Indirect Effects** – The effects of local inter-industry spending throughout the supply chain, for example, the electric power generated because of Summit’s project operations. Additionally, all construction activities are conducted by Summit’s contractors and are therefore considered indirect effects.
- **Induced Effects** – The results of employees of the directly and indirectly affected industries spending their income throughout the local economy.
- **Total Effect** – The sum of direct, indirect, and induced effects.

The 2022 IMPLAN data package, which is the most recent data available, was used for this analysis. The results of this analysis are presented using the following common economic modeling terms:

- **Output:** The broadest measure of economic activity – also commonly referred to as “sales.” Output refers to the total value of all sales of an industry within a study area without any deductions for the cost or origination of inputs that were used in the production process.
- **Value Added:** A component of output, this measure includes the total sales minus the costs of inputs. Alternatively, value added is calculated as the sum of labor income (further defined below), taxes on production and imports, and other property-type income. An entity’s value added is equivalent to its contribution to GDP.
- **Labor Income:** A subset of value added, includes the sum of employee compensation (i.e., wages and benefits) and proprietor income (i.e., income of self-employed workers).
- **Employment (Jobs):** A measure of part- and full-time job positions, including contract workers, without regard to their full-time equivalence. Since it is not representative solely of full-time positions or full-time equivalents, care must be made when drawing comparisons to other measures of employment. Note that for the construction impacts shown throughout this report, employment values are shown as the average number of jobs per year that will be supported throughout the (7-year) construction period.

4.2 Summarization of Capital Project Construction Costs

Total capital expenditures were adjusted so that only expenditures estimated to be local within these states were included. For example, equipment known to be supplied from outside of the five states included in the study area was not included in the impact analysis.

To properly characterize the impact of constructing the pipeline and laterals to ethanol plants, the capture facilities at the ethanol plants and the sequestration sites in North Dakota, an accurate estimate of professional services, site preparation/restoration, construction materials (by relevant categories), labor, etc. must be understood and quantified. We have worked with the Summit team to summarize these capital expenditure related costs according to the following categories:

- Capture
- Pipeline and Facilities (i.e., transportation)
- Sequestration
- Project Management

Based on our ongoing conversations with the Summit team, we have received cost estimates that have allowed us to disaggregate most costs at a low geographic level. The geographic level of summarization for all construction impact estimates has been dictated by the Summit team, which are:

- North Dakota
- South Dakota
- Nebraska
- Minnesota
- Iowa
- 5-state Region (North Dakota, South Dakota, Nebraska, Minnesota and Iowa)

4.3 Summarization of “Average” Annual Operations of Summit Carbon Solutions

In order to properly characterize the annual, recurring impact of operating the project, we have assumed Summit will be permanently storing carbon dioxide in accordance with the provisions outlined in Section 45 of the US Code.

Because Summit’s project is a multi-year project with an expected “ramp-up” period, we have quantified the expected annual average operations once the project is fully operational (i.e., Year 2). We have conducted the operations aspect of the Operations analysis at the same geography as the construction phase (5-state region and “by state”).

Estimates for the following operation budget categories (by major element of the project; Capture, Pipeline and Sequestration) were obtained from the Summit team:

- Labor
- Power
- Repairs and Maintenance
- Operating Supplies, Tooling and Chemicals

- Other (i.e., Utilities, Meals, Travel and Entertainment, Insurance, Regulatory Compliance Services and Fees, etc.)

Summit also provided DIS with an estimate of the property taxes that are expected to be paid because of the carbon capture and sequestration system. As these taxes are expected to be paid annually throughout the project’s operation, they are included in the operations impact results. All direct property tax impacts generated by IMPLAN were removed from the model output to avoid double counting and overstating the true tax impact.

The property tax estimates provided by Summit were calculated using the cost method approach to determine an estimated assessed fair market value of the assets. Pipeline costs were allocated to each jurisdiction using miles and diameter of pipe. The methodology utilized by Summit to prepare the property tax estimates appear reasonable and have been incorporated into the tax impacts for each state.

4.4 Additional Background on Selected Model Inputs

The following sub-sections provide additional details related to how some key model inputs were estimated.

4.4.1 Electricity Usage

All elements of the operation of the project require electricity usage. From an impact modeling standpoint, the source used for electricity generation differs based on fuel type used, causing differing levels of indirect and induced economic activity. To account for these differences, we adopted the estimated power profile available from the U.S. EPA (<https://www.epa.gov/egrid/power-profiler#/>) “West” grid subregion, which is shown visually in Figure 2.

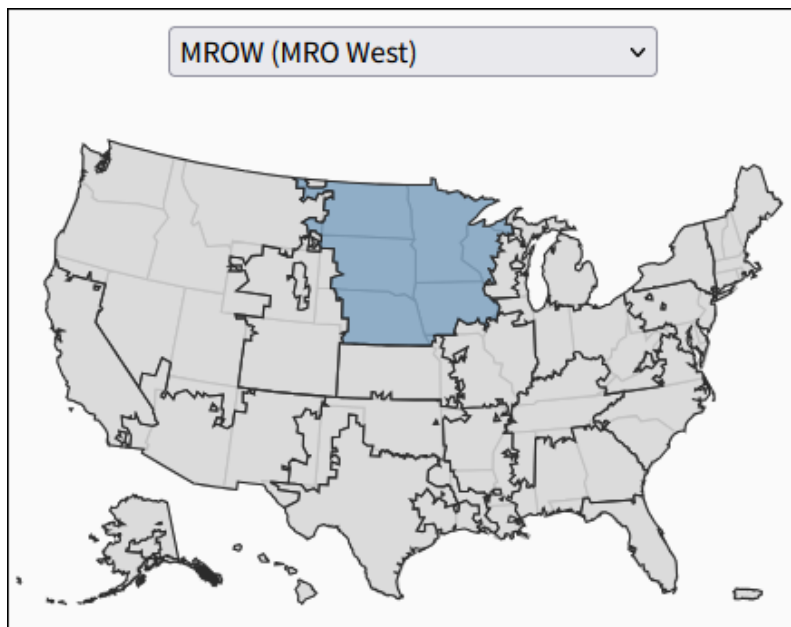


Figure 2, Grid Subregion Map

Using EPA data, we split the total power usage (in dollars) as provided by Summit according to the EPA mix, allowing us to account for fuel source when estimating the economic from the electricity purchase requirements from operating the project.

4.4.2 Estimation of Capital Expenditures Within vs. Without Study Area

At any geographic level below national, the likelihood of all capital expenditures required to build the project being sourced within the study area decreases as the geographic unit comprising the study area becomes smaller (i.e., multi-state to state to county, etc.). For example, pipe mills capable of rolling the necessary pipe to specs suitable for transporting CO₂ is not available at scale within the entire 5-state study area. This pipe is expected to be purchased from manufacturers in states such as Texas, Alabama and Arkansas, which means the manufacturing of the pipe is not expected to have an impact on the study area containing the pipeline and has therefore been excluded from the economic impact analysis. Similar treatment occurred for items such as some large valves and meters necessary for the construction of the pipeline and associated equipment.

In consultation with the Summit team, if a given capital expenditure category (or labor to construct or install it) is not known with certainty to be sourced within the study area, it was discounted between 33% and 45%, thereby yielding a more conservative estimate than would otherwise be presented in Section 5. The percentage discount varied by state and was provided by those on the Summit team who have direct knowledge of where capital expenditure items are likely to be sourced from (i.e., in or outside of the study area).

4.4.3 Regional Purchase Coefficients

In addition to the manual proration of capital expenditures mentioned in Section 4.2.2, the IMPLAN modeling software used for this analysis has built-in Regional Purchase Coefficients (RPCs), which further account for the share of a given input (i.e., IMPLAN industry) that is available locally. For example, the construction and operation of the project requires, among many others, the purchase of insurance, financial and legal services. The model assumes that some, but not all, of these services are available within the study area. All results for all elements of the project are adjusted for what share of inputs are available locally versus from outside the study area. An RPC varies by input (i.e., the RPC is different for insurance than for legal services, and so on) and is held constant for all portions of the research utilizing the IMPLAN models created for this analysis.

4.4.4 Proration of Costs

Several of the costs associated with constructing and operating the project are not easily tied to specific ethanol plant(s) or other distinct assets within the three major elements of the project (capture, transportation and sequestration). Depending on the cost in question, it was prorated according to one of two calculations:

1. The share of total CO₂ captured within a given state (i.e., Capture Facility Labor)
2. The share of pipeline mileage, adjusted for pipe diameter (i.e., Vegetation Control, Cell/Communications, Meals, Travel and Entertainment Expense, Insurance, Regulatory Compliance Services and Fees, etc.)

5 Regional Impact Results

The following two sections present 5-state study area results from methodology adopted as described in Section 4.

5.1 Construction Impact

Using the methodology steps outlined in Sections 4.2, Table 1 through Table 4 summarize the economic impact of constructing the Summit project, constructing the required lateral lines to ethanol plant and installing all required equipment to capture, pressurize, transport and sequester captured CO2 in subterranean wells located in North Dakota.

Table 1 shows that the economic impact from implementing plans associated with the Summit project are very significant. For example, total employment impacts are estimated to be 4,391 jobs, which results in \$2.066 billion in labor income. Total value-added from the project is estimated to be \$2.961 billion while total output impacts are estimated to be \$5.808 billion.

Table 1. Regional Construction Economic Impacts

Construction Economic Impacts				
Impact Type	Average Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)
Direct	175	\$ 184.1	\$ 193.5	\$ 467.2
Indirect	3,204	\$ 1,501.7	\$ 2,070.4	\$ 4,111.8
Induced	1,011	\$ 380.4	\$ 696.8	\$ 1,229.0
Total	4,391	\$ 2,066.1	\$ 2,960.7	\$ 5,808.1

Breaking the results down by state, Iowa is responsible for the largest share of all economic measures, which is due to its primary role in the project. Referring to Table 2, Iowa represents approximately 50% of all economic impact measures listed in Table 1. Similarly, South Dakota, another large contributor to the economic impact of the overall project, is responsible for about 25% of all economic impact measures.

Table 2. Construction Economic Impacts by State

Construction Economic Impacts by State				
Impact Type	Average Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)
Iowa	2,201	\$ 1,035.9	\$ 1,461.1	\$ 2,927.7
South Dakota	1,086	\$ 475.7	\$ 668.3	\$ 1,319.0
North Dakota	485	\$ 248.0	\$ 384.1	\$ 711.4
Nebraska	235	\$ 97.5	\$ 149.0	\$ 290.9
Minnesota	383	\$ 209.1	\$ 298.1	\$ 559.0

Taxes generated at all jurisdiction levels from constructing the Summit project are also significant (Table 3). Total tax impacts at all jurisdictions amounts to an estimated \$752.4 million, of which Iowa is responsible for \$374.3 million (Table 4). Total tax is comprised of payroll and income taxes, excise taxes,

duty taxes, corporate profit taxes, sales and use taxes, property taxes, and other miscellaneous taxes such as motor vehicle and hunting/fishing license taxes.

Table 3. Regional Construction Tax Impacts

Construction Tax Impacts			
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)
Direct	\$ 9.1	\$ 37.0	\$ 46.1
Indirect	\$ 232.2	\$ 322.7	\$ 555.0
Induced	\$ 61.5	\$ 89.9	\$ 151.3
Total	\$ 302.8	\$ 449.6	\$ 752.4

Table 4. Construction Tax Impacts by State

Construction Tax Impacts by State			
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)
Iowa	\$ 150.0	\$ 224.3	\$ 374.3
South Dakota	\$ 69.2	\$ 102.6	\$ 171.8
North Dakota	\$ 32.6	\$ 53.4	\$ 85.9
Nebraska	\$ 16.6	\$ 21.7	\$ 38.3
Minnesota	\$ 34.4	\$ 47.6	\$ 82.0

5.2 Operations Impact

Using the methodology steps outlined in Sections 4.3, economic impact estimates for operations are summarized in Table 5 through Table 8. As shown in Table 5, the 201 direct jobs associated with operating the project are estimated to initially create and then support another 1,065 jobs (1,266 total jobs). In other words, for every direct job initially created and then supported by operating the project, another 5.30 jobs are estimated to be initially created and then supported each year the project is in operation. Total value added from operating the project is estimated to be \$467.1 million, of which \$122.4 million is received as labor income.

Table 5. Regional Operations Economic Impacts

Operations Economic Impacts				
Impact Type	Average Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)
Direct	201	\$ 37.7	\$ 245.2	\$ 583.1
Indirect	654	\$ 62.4	\$ 181.2	\$ 383.8
Induced	412	\$ 22.3	\$ 40.7	\$ 71.8
Total	1,266	\$ 122.4	\$ 467.1	\$ 1,038.7

Table 6 shows the economic impact estimates by state. While all states contribute substantially to the overall total economic impact, Iowa is responsible for about 45%-50% of the total, depending on which economic measure is considered.

Table 6. Operations Economic Impacts by State

Operations Economic Impacts by State				
Impact Type	Average Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)
Iowa	578	\$ 57.8	\$ 245.0	\$ 510.7
South Dakota	260	\$ 23.2	\$ 86.4	\$ 224.3
North Dakota	198	\$ 18.5	\$ 49.8	\$ 121.8
Nebraska	73	\$ 7.2	\$ 33.7	\$ 65.2
Minnesota	156	\$ 15.7	\$ 52.1	\$ 116.7

Taxes generated at all jurisdiction levels from operating the Summit project are also significant (Table 7 and Table 8). Total tax impacts at all jurisdictions amounts to an estimated \$205.9 million, of which \$170.5 million is paid at the state and local levels while \$35.4 million is paid at the federal level.

Table 7. Regional Operations Tax Impacts

Operations Tax Impacts				
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)	
Direct	\$ 138.4	\$ 12.6	\$ 151.0	
Indirect	\$ 28.5	\$ 17.5	\$ 46.0	
Induced	\$ 3.6	\$ 5.3	\$ 8.9	
Total	\$ 170.5	\$ 35.4	\$ 205.9	

Table 8. Operations Tax Impacts by State

Operations Tax Impacts by State				
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)	
Iowa	\$ 97.9	\$ 17.4	\$ 115.3	
South Dakota	\$ 30.8	\$ 6.9	\$ 37.6	
North Dakota	\$ 11.2	\$ 4.6	\$ 15.8	
Nebraska	\$ 10.9	\$ 2.1	\$ 13.1	
Minnesota	\$ 19.7	\$ 4.4	\$ 24.1	

6 State Impact Results

The following five sections present state level results from methodology adopted which was described in Section 4.

6.1 Iowa

6.1.1 Construction

Iowa is expected to have the largest economic impact from construction due to it having much of the total pipeline mileage and captured carbon production. Additionally, Iowa is the location for the majority of the project management team due to Summit's Ames, Iowa headquarters.

The construction of a carbon pipeline and associated capture facilities within Iowa is estimated to produce more than \$2.928 billion in total sales through direct, indirect, and induced effects. More than 2,200 jobs will be supported on average over the construction period, generating a total of about \$1.036 billion in labor income (Table 9).

Table 9. Iowa Construction Economic Impacts

Iowa Construction Economic Impacts				
Impact Type	Average Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)
Direct	153	\$ 161.1	\$ 170.0	\$ 417.9
Indirect	1,552	\$ 701.2	\$ 955.1	\$ 1,921.3
Induced	496	\$ 173.5	\$ 336.0	\$ 588.6
Total	2,201	\$ 1,035.9	\$ 1,461.1	\$ 2,927.7

Construction activities within Iowa are estimated to generate \$374.3 million in tax revenue over the construction period, with \$150.0 million paid at the state and local levels and \$224.3 million paid at the federal level (Table 10). Please note that these estimated taxes paid are not all paid by Summit but represent an estimate of the total taxes (direct, indirect and induced) paid from all entities involved in the construction of the carbon capture and sequestration system.

Table 10. Iowa Construction Tax Impacts

Iowa Construction Tax Impacts			
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)
Direct	\$ 8.6	\$ 32.5	\$ 41.1
Indirect	\$ 108.0	\$ 150.1	\$ 258.1
Induced	\$ 33.4	\$ 41.7	\$ 75.2
Total	\$ 150.0	\$ 224.3	\$ 374.3

6.1.2 Operations

Summit is expected to hire 102 employees within Iowa to conduct its operations within the state. These operations are estimated to generate \$288.4 million in output and \$132.7 million in value added. When accounting for indirect and induced effects, the total impact of Summit's operations in Iowa is estimated

at 578 jobs, \$57.8 million in labor income, \$245.0 million in value added, and \$510.7 million in total sales annually (Table 11).

Table 11. Iowa Operations Economic Impacts

Iowa Operations Economic Impacts				
Impact Type	Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)
Direct	102	\$ 19.7	\$ 132.7	\$ 288.4
Indirect	283	\$ 28.5	\$ 93.6	\$ 189.6
Induced	193	\$ 9.7	\$ 18.7	\$ 32.7
Total	578	\$ 57.8	\$ 245.0	\$ 510.7

Summit’s operations in Iowa are estimated to generate \$115.3 million in total tax revenue, with \$97.9 million paid at the state and local levels and \$17.4 million at the federal level (Table 12). Note that this value includes an estimated increase of \$61.0 million in property taxes generated because of Summit’s project in Iowa. In other words, the \$61.0 million in property taxes that were estimated separately (by Summit) from this analysis are included in the \$80.0 million of direct taxes paid at the state and local levels (see Direct line in Table 12). The remaining \$19.0 million is what the estimated payment of taxes (other than property taxes) would be from the Summit project continuing operations from year to year (i.e., sales/use tax, etc.).

Table 12. Iowa Operations Tax Impacts

Iowa Operations Tax Impacts			
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)
Direct	\$ 80.0	\$ 6.7	\$ 86.7
Indirect	\$ 16.0	\$ 8.4	\$ 24.4
Induced	\$ 1.9	\$ 2.3	\$ 4.2
Total	\$ 97.9	\$ 17.4	\$ 115.3

6.2 South Dakota

6.2.1 Construction

South Dakota contains the second largest share of construction activity in terms of both pipeline mileage and captured carbon. The construction of these facilities in South Dakota is estimated to produce more than \$1.319 billion in total sales through Summit’s contractors and further indirect and induced effects. Nearly 1,100 jobs will be supported on average over the construction period, generating a total of \$475.7 million in labor income and \$668.3 million in total value added (Table 13).

Table 13. South Dakota Construction Economic Impacts

South Dakota Construction Economic Impacts					
Impact Type	Average Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)	
Direct	-	\$ -	\$ -	\$ -	\$ -
Indirect	854	\$ 384.3	\$ 509.7	\$ 1,036.4	
Induced	232	\$ 91.5	\$ 158.6	\$ 282.6	
Total	1,086	\$ 475.7	\$ 668.3	\$ 1,319.0	

Construction activities within South Dakota are estimated to generate \$171.8 million in tax revenue over the construction period, with \$69.2 million paid at the state and local levels and \$102.6 million paid at the federal level (Table 14).

Table 14. South Dakota Construction Tax Impacts

South Dakota Construction Tax Impacts				
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)	
Direct	\$ -	\$ -	\$ -	
Indirect	\$ 58.0	\$ 81.4	\$ 139.4	
Induced	\$ 11.2	\$ 21.2	\$ 32.4	
Total	\$ 69.2	\$ 102.6	\$ 171.8	

6.2.2 Operations

Summit is expected to hire 40 employees within South Dakota, which is estimated to directly produce \$48.1 million in value added and \$140.4 million in sales throughout the state. After accounting for indirect and induced effects, the total economic impact of Summit’s operations within the state is estimated to be 260 jobs, \$23.2 million in labor income, \$86.4 million in value added, and \$224.3 million in output (Table 15).

Table 15. South Dakota Operations Economic Impacts

South Dakota Operations Economic Impacts					
Impact Type	Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)	
Direct	40	\$ 7.7	\$ 48.1	\$ 140.4	
Indirect	141	\$ 11.1	\$ 30.6	\$ 70.2	
Induced	79	\$ 4.5	\$ 7.7	\$ 13.7	
Total	260	\$ 23.2	\$ 86.4	\$ 224.3	

Summit’s operations in South Dakota are estimated to generate \$37.6 million in total tax revenue, with \$30.8 million paid at the state and local levels and \$6.9 million paid at the federal level (Table 16). Note that this value includes an estimated increase of \$17.2 million in property taxes generated because of Summit’s project in South Dakota. In other words, the \$17.2 million in property taxes that were estimated separately (by Summit) from this analysis are included in the \$25.5 million of direct taxes paid at the state and local levels (see Direct line in Table 16). The remaining \$8.3 million is what the

estimated payment of taxes (other than property taxes) would be from the Summit project continuing operations from year to year (i.e., sales/use tax, etc.).

Table 16. South Dakota Operations Tax Impacts

South Dakota Operations Tax Impacts				
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)	
Direct	\$ 25.5	\$ 2.8	\$ 28.3	
Indirect	\$ 4.7	\$ 3.1	\$ 7.8	
Induced	\$ 0.5	\$ 1.0	\$ 1.6	
Total	\$ 30.8	\$ 6.9	\$ 37.6	

6.3 North Dakota

6.3.1 Construction

While North Dakota contains the fewest number of capture facilities among the five states, its construction impact is relatively large due to a large share of pipeline mileage, the construction of the sequestration facilities, and the presence of a portion of the project management team located in Summit’s Bismarck, North Dakota office.

The construction of a carbon pipeline and associated sequestration facilities within North Dakota is estimated to produce \$711.4 million in total sales through direct, indirect, and induced effects. Nearly 500 jobs will be supported on average over the construction period, generating a total of about \$248.0 million in labor income and \$384.1 million in value added (Table 17).

Table 17. North Dakota Construction Economic Impacts

North Dakota Construction Economic Impacts					
Impact Type	Average Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)	
Direct	22	\$ 22.9	\$ 23.5	\$ 49.4	
Indirect	341	\$ 177.6	\$ 281.5	\$ 515.1	
Induced	122	\$ 47.5	\$ 79.2	\$ 147.0	
Total	485	\$ 248.0	\$ 384.1	\$ 711.4	

Construction in North Dakota is estimated to generate a total of \$32.6 million in tax revenue at the state and local levels and \$53.4 million at the federal level for a total of \$85.9 million (Table 18).

Table 18. North Dakota Construction Tax Impacts

North Dakota Construction Tax Impacts				
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)	
Direct	\$ 0.5	\$ 4.5	\$ 5.0	
Indirect	\$ 28.0	\$ 38.3	\$ 66.3	
Induced	\$ 4.1	\$ 10.6	\$ 14.7	
Total	\$ 32.6	\$ 53.4	\$ 85.9	

6.3.2 Operations

Summit is expected to hire 38 employees within North Dakota and directly produce \$24.8 million in value added and \$63.1 million in sales throughout the state. After accounting for indirect and induced effects, the total economic impact of Summit’s operations within the state is estimated to be 198 jobs, \$18.5 million in labor income, \$49.8 million in value added, and \$121.8 million in output (Table 19).

Table 19. North Dakota Operations Economic Impacts

North Dakota Operations Economic Impacts					
Impact Type	Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)	
Direct	38	\$ 6.5	\$ 24.8	\$ 63.1	
Indirect	105	\$ 9.0	\$ 19.9	\$ 49.2	
Induced	56	\$ 3.1	\$ 5.1	\$ 9.6	
Total	198	\$ 18.5	\$ 49.8	\$ 121.8	

Summit’s operations in North Dakota are estimated to generate \$15.8 million in total tax revenue, with \$11.2 million paid at the state and local levels and \$4.6 million paid at the federal level (Table 20). Note that this value includes an estimated increase of \$6.5 million in property taxes generated because of Summit’s project in North Dakota. In other words, the \$6.5 million in property taxes that were estimated separately (by Summit) from this analysis are included in the \$9.0 million of direct taxes paid at the state and local levels (see Direct line in Table 20). The remaining \$2.5 million is what the estimated payment of taxes (other than property taxes) would be from the Summit project continuing operations from year to year (i.e., sales/use tax, etc.).

Table 20. North Dakota Operations Tax Impacts

North Dakota Operations Tax Impacts				
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)	
Direct	\$ 9.0	\$ 1.7	\$ 10.8	
Indirect	\$ 1.9	\$ 2.2	\$ 4.1	
Induced	\$ 0.3	\$ 0.7	\$ 1.0	
Total	\$ 11.2	\$ 4.6	\$ 15.8	

6.4 Nebraska

6.4.1 Construction

The construction of a carbon pipeline and associated capture facilities in Nebraska is estimated to produce more than \$290.9 million in total sales through Summit’s contractors and further indirect and induced effects. About 235 jobs will be supported on average over the construction period, generating a total of \$97.5 million in labor income and \$149.0 million in total value added (Table 21).

Table 21. Nebraska Construction Economic Impacts

Nebraska Construction Economic Impacts					
Impact Type	Average Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)	
Direct	-	\$ -	\$ -	\$ -	\$ -
Indirect	187	\$ 79.6	\$ 114.3	\$ 231.3	
Induced	48	\$ 17.9	\$ 34.8	\$ 59.6	
Total	235	\$ 97.5	\$ 149.0	\$ 290.9	

Construction activities within Nebraska are estimated to generate \$38.3 million in tax revenue over the construction period, with \$16.6 million paid at the state and local levels and \$21.7 million paid at the federal level (Table 22).

Table 22. Nebraska Construction Tax Impacts

Nebraska Construction Tax Impacts				
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)	
Direct	\$ -	\$ -	\$ -	
Indirect	\$ 13.6	\$ 17.4	\$ 31.0	
Induced	\$ 2.9	\$ 4.3	\$ 7.3	
Total	\$ 16.6	\$ 21.7	\$ 38.3	

6.4.2 Operations

Summit is expected to hire 8 employees within Nebraska, which is estimated to directly produce \$16.1 million in value added and \$35.6 million in sales throughout the state. After accounting for indirect and induced effects, the total economic impact of Summit’s operations within the state is estimated to be 73 jobs, \$7.2 million in labor income, \$33.7 million in value added, and \$65.2 million in output (Table 23).

Table 23. Nebraska Operations Economic Impacts

Nebraska Operations Economic Impacts					
Impact Type	Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)	
Direct	8	\$ 1.6	\$ 16.1	\$ 35.6	
Indirect	40	\$ 4.2	\$ 15.0	\$ 25.1	
Induced	25	\$ 1.3	\$ 2.6	\$ 4.4	
Total	73	\$ 7.2	\$ 33.7	\$ 65.2	

Summit’s operations in Nebraska are estimated to generate \$13.1 million in total tax revenue, with \$10.9 million paid at the state and local levels and \$2.1 million paid at the federal level (Table 24). Note that this value includes an estimated increase of \$8.7 million in property taxes generated because of Summit’s project in Nebraska. In other words, the \$8.7 million in property taxes that were estimated separately (by Summit) from this analysis are included in the \$9.1 million of direct taxes paid at the state and local levels (see Direct line in Table 24). The remaining \$0.4 million is what the estimated payment

of taxes (other than property taxes) would be from the Summit project continuing operations from year to year (i.e., sales/use tax, etc.).

Table 24. Nebraska Operations Tax Impacts

Nebraska Operations Tax Impacts				
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)	
Direct	\$ 9.1	\$ 0.5	\$ 9.6	
Indirect	\$ 1.6	\$ 1.3	\$ 2.9	
Induced	\$ 0.2	\$ 0.3	\$ 0.5	
Total	\$ 10.9	\$ 2.1	\$ 13.1	

6.5 Minnesota

6.5.1 Construction

Minnesota contains the fourth largest share of construction activity in terms of both pipeline mileage and captured carbon. The construction of these facilities in Minnesota is estimated to produce \$559.0 million in total sales through Summit’s contractors and further indirect and induced effects. 383 jobs will be supported on average over the construction period, generating a total of \$209.1 million in labor income and \$298.1 million in total value added (Table 25).

Table 25. Minnesota Construction Economic Impacts

Minnesota Construction Economic Impacts					
Impact Type	Average Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)	
Direct	-	\$ -	\$ -	\$ -	
Indirect	271	\$ 159.1	\$ 209.8	\$ 407.7	
Induced	113	\$ 50.0	\$ 88.3	\$ 151.3	
Total	383	\$ 209.1	\$ 298.1	\$ 559.0	

Construction activities within Minnesota are estimated to generate \$82.0 million in tax revenue over the construction period, with \$34.4 million paid at the state and local levels and \$47.6 million paid at the federal level (Table 26).

Table 26. Minnesota Construction Tax Impacts

Minnesota Construction Tax Impacts				
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)	
Direct	\$ -	\$ -	\$ -	
Indirect	\$ 24.7	\$ 35.6	\$ 60.2	
Induced	\$ 9.7	\$ 12.1	\$ 21.8	
Total	\$ 34.4	\$ 47.6	\$ 82.0	

6.5.2 Operations

Summit is expected to hire 13 employees within Minnesota, which is estimated to directly produce \$23.5 million in value added and \$55.7 million in sales throughout the state. After accounting for indirect and induced effects, the total economic impact of Summit’s operations within the state is estimated to be 156 jobs, \$15.7 million in labor income, \$52.1 million in value added, and \$116.7 million in output (Table 27).

Table 27. Minnesota Operations Economic Impacts

Minnesota Operations Economic Impacts					
Impact Type	Annual Employment	Labor Income (\$ Million)	Value Added (\$ Million)	Output (\$ Million)	
Direct	13	\$ 2.3	\$ 23.5	\$ 55.7	
Indirect	85	\$ 9.7	\$ 22.0	\$ 49.7	
Induced	59	\$ 3.7	\$ 6.6	\$ 11.3	
Total	156	\$ 15.7	\$ 52.1	\$ 116.7	

Summit’s operations in Minnesota are estimated to generate \$24.1 million in total tax revenue, with \$19.7 million paid at the state and local levels and \$4.4 million paid at the federal level (Table 28). Note that this value includes an estimated increase of \$13.2 million in property taxes generated because of Summit’s project in Minnesota. In other words, the \$13.2 million in property taxes that were estimated separately (by Summit) from this analysis are included in the \$14.8 million of direct taxes paid at the state and local levels (see Direct line in Table 28). The remaining \$1.6 million is what the estimated payment of taxes (other than property taxes) would be from the Summit project continuing operations from year to year (i.e., sales/use tax, etc.).

Table 28. Minnesota Operations Tax Impacts

Minnesota Operations Tax Impacts				
Impact Type	State and Local (\$ Million)	Federal (\$ Million)	Total (\$ Million)	
Direct	\$ 14.8	\$ 0.9	\$ 15.7	
Indirect	\$ 4.2	\$ 2.6	\$ 6.7	
Induced	\$ 0.7	\$ 0.9	\$ 1.6	
Total	\$ 19.7	\$ 4.4	\$ 24.1	