

Appendix 22C
Regional Economics Modeling

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APPENDIX 22C

Regional Economics Modeling

22C.1 Introduction

Direct economic impacts due to changes in water supply and other factors from the Sites Reservoir Project (Project) will have effects in other parts of the state economy. Increased revenues in one sector increases employee compensation and, in turn, spending in other parts of the economy. These are frequently referred to as “multiplier” effects and correspond to changes in the regional economy based on linkages between industry sectors. For example, if crop acreage increases due to additional Project water supply, farmers purchase more seed, chemicals and labor, and these businesses and workers in turn increase their purchases. The shares of these inter-industry purchases that are from regional businesses represent additional changes in economic activity. These inter-industry transactions continue until limited by the shares of purchases that are imported into the region.

Input-output (I-O) models are used to estimate direct, indirect, and induced effects. The Project analysis uses the Impact Analysis for PLANning (IMPLAN) model. IMPLAN is a widely-used and accepted regional economic model that can measure the effect of projects or policies on local economic conditions. The IMPLAN model can estimate changes in regional output, labor income, value added, employment, and tax base. Total economic effects within a region equal the sum of direct, indirect, and induced effects.

22C.2 Impact Analysis for Planning (IMPLAN) Model

22C.2.1 Description

The IMPLAN model was originally developed by the U.S. Department of Agriculture Forest Service to assist in land and resource management planning, but its role has expanded to serve clients in federal, state, and local governments, universities, as well as the private sector. The primary advantages of IMPLAN include a comprehensive underlying dataset, opportunities for customization, robust multipliers based on a complete set of social accounts, and detailed trade-flow data that allows for multi-regional analysis.

The 2008 IMPLAN dataset for California (and all counties) was used to develop both the state and regional-level models used in the Project analysis. IMPLAN estimates changes in the local and related sectors of the regional economy. The Project analysis considers changes in the state economy and changes in the regional economy directly around the Project. The former is used to estimate changes stemming from the agricultural economy, since agriculture is a large component of California’s economy. The regional effects are those directly around the Project area, including Glenn and Colusa counties.

The IMPLAN model estimates include direct and indirect and induced (multiplier) effects. Direct effects include the primary effects on revenues, employment, and value added on the sectors that are directly affected by changes due to the Project. Multiplier effects include both indirect effects on the businesses in related sectors and induced effects of changes in household spending on the overall economy. For example, consider an increase in agricultural water supply due to the Project. Direct effects include reduced agricultural production, revenues, and incomes of farmers, landowners, and farm employees. Indirect effects include increased demand for farm inputs in addition to increased supply of agricultural outputs to processing plants, facilities, business that sell produce and related goods. This also affects the

individual business, as revenues and income fall. In turn, employees of these establishments earn less and reduce spending, which is an induced effect.

Because IMPLAN is an annual model, all model inputs were converted into average annual values (undiscounted) based on a straight-line extrapolation of project effects between 2025 and 2060 levels of development.

22C.2.1.1 IMPLAN Model Geographic Scope

It is necessary to define the relevant geographic area for I-O analysis. For the Project, two regions are considered, requiring the development of two separate IMPLAN models. The first is a local-level model that is intended to capture effects in close proximity to the Project. The local model covers Colusa and Glenn counties, the two counties within which the Project would be located. This model will be referred to as the two-county model throughout the rest of this Appendix. The second model is a statewide model that covers the entire state of California. This second model, also referred to as the California model, was developed to capture the large geographic extent of effects anticipated under the Project. For each type of impact evaluated, the appropriate model was selected based on the location of direct effects and geographic extent of economic linkages. It is acknowledged that effects evaluated at the local, two-county level would also likely generate statewide effects as a result of imports of capital and labor into the region.

The Project would generate a range of economic effects. Many of these effects, in turn, would also support regional economic activity in both the local two-county area (surrounding Sites Reservoir) and throughout the state. For this analysis, the following drivers of regional economic effects are evaluated:

- Construction expenditures (local model)
- O&M expenditures (local model)
- Recreation spending (local model)
- Agricultural production (statewide model)

22C.2.1.2 Interactions with Other Models¹

The Statewide Agricultural Planning model (SWAP) model output is used as part of the input to regional economic analysis using the IMPLAN model. SWAP model output includes gross farm revenue losses by region and crop and is used in the statewide IMPLAN model analysis.²

A separate set of agricultural output estimates is available from SWAP based on endogenous prices in the model. These values represent output changes resulting from price-level effects in agricultural markets. Generally, holding all else constant, future agricultural prices tend to decrease with the Project resulting in lower income levels for affected farmers. These endogenous price changes reduce agricultural production values by up to \$1.9 million per year in 2025 and \$1.3 million by 2060. Because these revenues are not attributed to physical changes in production, and instead reflect changes in revenues due to market conditions, these values were modeled as a household income change in IMPLAN.

¹ For further discussion of IMPLAN modeling and interactions with other models, see the NODOS Feasibility Report.

² For further discussion of the SWAP model, see Chapter 22 Agricultural Economics Technical Appendix.

22C.2.1.3 Assumptions and Limitations³

The IMPLAN model provides a “snap-shot” representation of a regional economy and, as such, tends to be more rigid than an economy may be in practice. Thus, IMPLAN tends to provide upper bound estimates of the annual economic gain/loss from a proposed policy. More flexible transitions and adjustments are likely to occur over time, thus benefits (costs) may be over (under) stated.

22C.2.1.4 Local, two-county IMPLAN Model – Project Construction

The local two-county IMPLAN model was used to evaluate changes in construction expenditures (Tables 22C-1, 22C-2, and 22C-3). The indirect and induced labor income; indirect and induced employment; and all of the output values for Alternative D (Table 22C-4) are assumed to be the same as those for Alternative C as the IMPLAN model was not run for Alternative D.

The development of the Project would require substantial capital investment, including land acquisition, construction of the facilities and mitigation-related costs. Project costs include payments to construction labor, as well as procurement of construction-related goods and services. To the extent that construction spending occurs locally, the Project would generate regional economic effects in the local study area (i.e., Colusa and Glenn counties). However, based on the small size of the local economy, it is anticipated that a substantial portion of the construction expenditures would be for labor and commodities imported into the region.

Since the local (i.e., within the two county region) labor pool is not large enough, it is expected that some portion of the construction workforce would be from outside this region. Some of these non-local workers may choose to temporarily relocate to the region for the duration of the Project or may choose to stay in local lodging in the region. Construction labor payments generate additional economic activity as workers spend money locally. For the analysis, it is assumed that 30 percent of the construction workers would come from the local area, and of the remaining non-local workforce, approximately 20 percent would reside (and spend) locally while employed by the Project. These labor payments are modeled in IMPLAN as a labor income change (Sector 5001, *Employee Compensation*).

Other Project expenditures consist primarily of purchases of construction materials (e.g., concrete and steel) and construction equipment required to develop Project facilities. A majority of materials are expected to be sourced within the local counties. However, other large capital equipment, such as power generating turbines, would need to be purchased from outside the two-county region and installed at the site. It is estimated that a portion of non-labor construction expenditures will be imported into the local two-county region (i.e., Colusa and Glenn counties). The extent to which the remaining construction expenditures filter through local industries is estimated by IMPLAN through the regional purchase coefficients (RPCs) implicit in the production function in the construction sector. Non-labor construction expenditures are modeled in IMPLAN as industry spending pattern change (Sector 36, *Construction of other new nonresidential structures*).⁴

The Project would require land acquisition in order to accommodate Project facilities, including land underlying Sites Reservoir. There are no regional economic effects associated with transfer of principal land values as such transactions represent a trade of cash assets for land assets. However, expenditures for

³ For further discussion of IMPLAN modeling and assumptions and limitations, see the NODOS Feasibility Report.

⁴ Using this approach, the production function coefficients were normalized to 1, thereby removing all value-added components as payroll impacts were modeled separately.

real estate and legal fees are expected to generate local economic effects. For the current analysis, it is assumed that non-principal costs account for 10 percent of total acquisition cost which is allocated equally to real estate and legal fees. In IMPLAN, real estate and legal costs were modeled as industry changes (Sector 360, *Real Estate Establishments* and Sector 367, *Legal Services*, respectively). Effects associated with land acquisition are assumed to be one-time effects occurring in a single year at the commencement of Project development.

There are several caveats to the IMPLAN analysis of Project construction effects. First, the effects attributed to the construction of the Project may be offset by reduced construction for water supply facilities and projects elsewhere in the state. The Least Cost Planning Simulation Model (LCPSIM) and SWAP models show that the Project would reduce spending for reclamation, conservation, local projects, and demand for groundwater in other parts of the state.⁵ To the extent that the Project would reduce the need for other water projects, construction effects attributed to those other projects would be reduced accordingly; however, these other projects would be located primarily outside the local study area. In addition, to the extent that the Project is financed with local funding sources, the beneficial effects of construction may be offset by the negative effects of financing the Project, which may result in reduced expenditures on other public projects.

Project Construction Impact Summary Results

Table 22C-1
Alternative A Project Construction Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect (Outside Model)	143	\$44,479,167	\$1,983,169,288
Indirect Effect	259	\$11,985,703	\$31,823,934
Induced Effect	108	\$4,560,856	\$16,231,836
Total Effect (w/o outside model)	367	\$16,546,559	\$48,055,771
Total Effect (w/ outside model)	510	\$61,025,726	\$2,031,225,059

Note:

Direct effect = total cost/employment/payroll

Income and output reported in 2015 dollars

Table 22C-2
Alternative B Project Construction Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect (Outside Model)	144	\$44,895,833	\$1,983,169,288
Indirect Effect	490	\$12,116,934	\$32,172,371
Induced Effect	96	\$4,605,124	\$16,389,386
Total Effect (w/o outside model)	586	\$16,722,058	\$48,561,757
Total Effect (w/ outside model)	730	\$61,617,891	\$2,031,731,045

Note:

Direct effect = total cost/employment/payroll

Income and output reported in 2015 dollars

⁵ For further discussion of LCPSIM, see Chapter 22 Municipal and Industrial Water Supply Economics Technical Appendix

Table 22C-3
Alternative C Project Construction Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect (Outside Model)	156	\$48,638,542	\$1,983,169,288
Indirect Effect	490	\$13,123,033	\$34,843,724
Induced Effect	96	\$4,988,700	\$17,754,510
Total Effect (w/o outside model)	586	\$18,111,733	\$52,598,234
Total Effect (w/ outside model)	742	\$66,750,274	\$2,035,767,522

Note:

Direct effect = total cost/employment/payroll
Income and output reported in 2015 dollars

Table 22C-4
Alternative D Project Construction Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect (Outside Model)	159	\$49,711,458	\$1,983,169,288
Indirect Effect	490	\$13,166,776	\$34,959,869
Induced Effect	96	\$5,078,728	\$18,074,906
Total Effect (w/o outside model)	586	\$18,245,505	\$53,034,775
Total Effect (w/ outside model)	745	\$67,956,963	\$2,036,204,063

Note:

Direct effect = total cost/employment/payroll
Income and output reported in 2015 dollars

22C.2.1.5 Local IMPLAN Model – Project Operations

Once construction is complete, the Project would support hydropower production at Sites Reservoir and other ancillary generating facilities. The value of hydropower generation represents the direct output value of Project operations, which in itself does not generate regional effects as the Project is a net user of power. Instead, the regional economic effects of Project operations are solely attributed to local employment and spending to support ongoing O&M activities (Tables 22C-5, 22C-6, 22C-7, and 22C-8). The regional economic effects associated with Project operations under Alternative D were extrapolated from those under Alternative C.

It is assumed that all employees would reside in the local area. Similar to construction payroll, these labor payments are modeled in IMPLAN as a labor income change (Sector 5001, *Employee Compensation*). In addition, Project operations would require ongoing O&M expenditures on miscellaneous goods and services primarily to support the hydropower operations, but also maintenance of the reservoir's recreation facilities. Non-labor operations expenditures are modeled in IMPLAN as industry spending pattern changes for power production (Sector 31, *Electric Power Generation, Transmission and Distribution*) and recreation facility maintenance (Sector 39, *Maintenance and repair construction of nonresidential structures*).

Project Operations Impact Summary Results

Table 22C-5
Alternative A Project Operations Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect (outside model)	35	\$1,901,668	\$0
Indirect Effect	6	\$242,757	\$705,711
Induced Effect	5	\$158,908	\$578,845
Total Effect (w/o outside model)	11	\$401,665	\$1,284,556
Total Effect (w/ outside model)	46	\$2,303,333	\$1,284,556

Note:

Direct effect = power value/employment/payroll

Income and output reported in 2015 dollars

Table 22C-6
Alternative B Project Operations Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect (outside model)	30	\$1,630,001	\$0
Indirect Effect	6	\$229,164	\$666,261
Induced Effect	4	\$137,800	\$501,985
Total Effect (w/o outside model)	10	\$366,964	\$1,168,246
Total Effect (w/ outside model)	40	\$1,996,966	\$1,168,246

Note:

Direct effect = power value/employment/payroll

Income and output reported in 2015 dollars

Table 22C-7
Alternative C Project Operations Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect (outside model)	35	\$1,901,668	\$0
Indirect Effect	6	\$242,757	\$705,711
Induced Effect	5	\$158,908	\$578,845
Total Effect (w/o outside model)	11	\$401,665	\$1,284,556
Total Effect (w/ outside model)	46	\$2,303,333	\$1,284,556

Note:

Direct effect = power value/employment/payroll

Income and output reported in 2015 dollars

Table 22C-8
Alternative D Project Operations Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect (outside model)	38	\$1,901,668	\$0
Indirect Effect	6	\$242,757	\$705,711
Induced Effect	5	\$158,908	\$578,845
Total Effect (w/o outside model)	11	\$401,665	\$1,284,556
Total Effect (w/ outside model)	46	\$2,303,333	\$1,284,556

Note:

Direct effect = power value/employment/payroll

Income and output reported in 2015 dollars

22C.2.1.6 Local IMPLAN Model – Recreation

The development of Sites Reservoir would draw recreational visitors to the region and induce recreation-related spending at local businesses. Typical recreation-related expenditures include food, lodging, fuel, recreation equipment and services, and other miscellaneous retail goods. To the extent that recreation spending is attributed to visitors from outside the region, the retail will represent new income added to the local economy, which would generate regional economic effects by supporting jobs and generating income for local residents (Tables 22C-9, 22C-10, 22C-11, 22C-12). Recreation spending under Alternative D is assumed to be the same as that under Alternative C.

For the Project analysis, the level of recreation visits and the proportion of visits from outside of the region are estimated. It is assumed that roughly 26 percent of future visitors to Sites Reservoir will come from outside the region. Expenditures by these visitors serve as inputs to IMPLAN. Expenditures by category were assigned to applicable IMPLAN sectors as follows:

- Lodging: Sector 411, Hotels and motels, including casino hotels
- Restaurants: Sector 413, Food services and drinking places
- Groceries: Sector 324, Retail stores–food and beverage
- Gas and oil: Sector 326, Retail stores–gasoline stations
- Other transportation: Sector 320, Retail stores–motor vehicle and parts
- Entry fees: Sector 432, Other state and local government enterprises
- Recreation and entertainment: Sector 410, Other amusement and recreation industries
- Sporting goods: Sector 328, Retail stores–sporting goods, hobby, book, and music
- Souvenirs and other: Sector 329, Retail stores–general merchandise

Recreation Impact Summary Results

Table 22C-9
Alternative A Recreation Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	15	\$395,344	\$1,525,659
Indirect Effect	1	\$39,052	\$17,653
Induced Effect	1	\$39,052	\$13,291
Total Effect	17	\$477,544	\$1,556,603

Note:

Income and output reported in 2015 dollars

Table 22C-10
Alternative B Recreation Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	15	\$392,712	\$1,515,606
Indirect Effect	1	\$39,052	\$17,654
Induced Effect	1	\$39,052	\$13,292
Total Effect	17	\$473,639	\$1,546,552

Note:

Income and output reported in 2015 dollars

Table 22C-11
Alternative C Recreation Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	16	\$409,557	\$1,580,644
Indirect Effect	1	\$39,052	\$17,654
Induced Effect	1	\$39,052	\$13,292
Total Effect	18	\$494,280	\$1,611,590

Note:

Income and output reported in 2015 dollars

Table 22C-12
Alternative D Recreation Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	16	\$409,557	\$1,580,644
Indirect Effect	1	\$39,052	\$17,654
Induced Effect	1	\$39,052	\$13,292
Total Effect	18	\$494,280	\$1,611,590

Note:

Income and output reported in 2015 dollars

22C.2.1.7 State IMPLAN Model – Agricultural Production⁶

Agriculture is a key industry in California, directly supporting a large number of jobs and income at the farm level and indirectly generating economic activity across the state based on a wide range of inter-industry linkages with the agricultural sector. Additional water supplies from the Project would increase the number of irrigated acres in the state, thereby increasing crop production levels and related agricultural output (revenues) holding prices fixed at base levels. In addition, the Project would also affect agricultural markets through changes in commodity supplies resulting in reductions in market prices for affected crops and associated revenues received by farmers. These two effects are modeled separately using the IMPLAN state model for California.

The SWAP model estimates the value of agricultural output across a range of different crops (under base price levels). These figures reflect the change in farm gate production values attributed to changes in irrigated acreage and excludes market effects on prices. These direct effects serve as inputs to the applicable agricultural sectors in IMPLAN based on crop type as shown in Table 22C-13.

Table 22C-13
Agricultural Sectors – SWAP and IMPLAN
Regional Economics Modeling

SWAP Crop Code	IMPLAN Sector
Almonds	Sector 5: Tree nut farming
Alfalfa Hay	Sector 10: All other crop farming
Grain Corn	Sector 2: Grain farming
Cotton	Sector 8: Cotton farming
Summer Squash	Sector 3: Vegetable and melon farming
Dry Beans	Sector 10: Tree nut farming
Fresh Tomatoes	Sector 3: Vegetable and melon farming
Wheat	Sector 2: Grain farming
Dry Onions	Sector 3: Vegetable and melon farming
Walnuts	Sector 5: Tree nut farming
Sudan Grass Hay	Sector 10: All other crop farming
Broccoli	Sector 3: Vegetable and melon farming
Irrigated Pasture	Sector 10: All other crop farming
White Potatoes	Sector 3: Vegetable and melon farming
Processing Tomatoes	Sector 3: Vegetable and melon farming
Rice	Sector 2: Grain farming
Safflower	Sector 1: Oilseed farming
Sugar Beets	Sector 9: Sugar cane and sugar beet farming
Oranges	Sector 4: Fruit farming
Wine Grapes	Sector 4: Fruit farming

⁶ For further discussion of IMPLAN modeling and state agricultural impact summary results see the NODOS Feasibility Report.

As a result of the Project's additional water supplies for farming, agricultural output values are also expected to increase due to reduced land fallowing for water transfers to environmental and urban water users. This effect is not captured in the SWAP model. Instead, estimated changes in agricultural production attributed to reductions in water transfers can be inferred based in part on modeling output from LCPSIM (for M&I supplies) while changes in water transfers for environmental purposes are expected to have a negligible impact. The source supplies from these water transfers are concentrated in the San Joaquin Valley and Sacramento Valley and to a lesser extent in the Colorado River Basin.

The proportion of water transfers that would affect agricultural production is unknown. In addition to crop idling, water supplies made available for transfer can also be derived from groundwater pumping and storage. Therefore, it is difficult to estimate the net increase on agricultural production, which could generate regional economic effects based on inter-industry linkages with agricultural-support and other industries across the state.

Further, any potential positive effects realized in the agricultural industry must be balanced with reductions in revenues to farmers from water transfer payments. Such payments represent an income stream to farmers that would help offset losses in agricultural revenues. In such instances, instead of money filtering through the agricultural sector, lost revenues from water transfers represent a decrease in household income, which is typically spent in accordance with representative household spending patterns. In the case of farmers, these funds may also be used for capital investment in their agricultural operations (e.g., purchase of new farm machinery). Without such revenues, there would be some decline in regional economic activity.

Without specific information on sources of water transfers, types of crops grown, idled croplands and farmer spending patterns, the net effect on income and employment levels in the state is unknown. Conceptually, these effects would partially offset one another depending on the magnitude of multipliers across affected industries. Overall, it is anticipated that the net effect on the regional economy would be minor.

Increased water supplies from the Project would reduce groundwater pumping and increase net incomes for farmers. This effect is not included because the offsetting cost for supplying Project water is not considered. It is expected that the Project's variable water supply costs would be less than variable groundwater pumping costs since water users must have incentive to take the water. The cost differential, however, is unknown.

In addition to water transfers and costs, discussed above, that are excluded from the analysis, the following categories of impacts are not included in the IMPLAN analysis:

- **Changes in water rates.** Changes in water costs required for repayment of the Project could result in changes in customer water rates. Increased rates should decrease household and business spending, and all else equal, regional economic activity would be reduced. However, rate changes would depend on how the Project is financed, which is unknown at this time. Also, increased Project water costs would be largely offset by reduced costs for other water supplies.
- **Changes in costs attributable to improved water quality.** Reduced salinity in the South Coast would result in real cost savings for consumers by extending the life of fixtures and appliances and reducing purchases of water softeners, bottled water and other substitutes. Cost savings would also be realized by agricultural producers in areas with salinity issues. These savings increase the amount of disposable income of consumers and farmers, which may be offset by reduced expenditures

addressing water quality impacts. In addition, the beneficiaries of water quality improvements may be responsible to repay the water quality-related costs of the Project. For example, rates may increase to water users in the service area of agencies that water quality improves.

- **Increased value of output in the South Coast region.** Increased water supplies for the South Coast could increase industrial output during drought periods. However, hydrologic data indicate that even in dry/critical years, available water supplies without the Project would meet 75 percent of demand. At this level of reductions, minimal disruption to industrial output may be expected since public landscaping and residential users would bear most of the cost of shortage.
- **Increased value of hydroelectric production in the Central Valley.** The Project operations analysis for the reservoir captures the hydropower generation effects at the local level from future operations and maintenance of the hydroelectric facilities. Given the relatively small magnitude of the electrical production by the Project (even under the optimized and pumpback operations), the regional economic effects associated with changes in hydropower production throughout the rest of the system would likely be negligible. There are not likely to be income and job effects at other SWP/CVP power facilities since no additional hiring and minimal operational costs may be expected to accommodate the Project's incorporation into the utility system.

22C.2.1.8 Local IMPLAN Model – Agricultural Production

Local agriculture is temporarily and permanently removed from production to accommodate Project construction and operation, respectively. A reduction in the number of irrigated acres in the local region would decrease crop production levels and related agricultural output (revenues) reducing employment and labor income (Tables 22C-14, 22C-15, 22C-16, 22C-17, 22C-18, 22C-19, 22C-20, and 22C-21).

Local Temporary Agricultural Impact Summary Results

Table 22C-14
Alternative A Local Temporary Agricultural Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	-44	-\$691,162	-\$7,708,584
Indirect Effect	-15	-\$562,084	-\$1,190,381
Induced Effect	-3	-\$96,234	-\$353,438
Total Effect	-62	-\$1,349,480	-\$9,252,403

Note:

Income and output reported in 2015 dollars

Table 22C-15
Alternative B Local Temporary Agricultural Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	-44	-\$691,162	-\$7,708,584
Indirect Effect	-15	-\$562,084	-\$1,190,381
Induced Effect	-3	-\$96,234	-\$353,438
Total Effect	-62	-\$1,349,480	-\$9,252,403

Note:

Income and output reported in 2015 dollars

Table 22C-16
Alternative C Local Temporary Agricultural Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	-44	-\$691,162	-\$7,708,584
Indirect Effect	-15	-\$562,084	-\$1,190,381
Induced Effect	-3	-\$96,234	-\$353,438
Total Effect	-62	-\$1,349,480	-\$9,252,403

Note:

Income and output reported in 2015 dollars

Table 22C-17
Alternative D Local Temporary Agricultural Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	-44	-\$691,162	-\$7,708,584
Indirect Effect	-15	-\$562,084	-\$1,190,381
Induced Effect	-3	-\$96,234	-\$353,438
Total Effect	-62	-\$1,349,480	-\$9,252,403

Note:

Income and output reported in 2015 dollars

Local Permanent Agricultural Impact Summary Results

Table 22C-18
Alternative A Local Permanent Agricultural Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	-5	-\$222,194	-\$1,666,382
Indirect Effect	-4	-\$162,618	-\$315,615
Induced Effect	-1	-\$29,444	-\$108,055
Total Effect	-10	-\$414,256	-\$2,090,053

Note:

Income and output reported in 2015 dollars

Table 22C-19
Alternative B Local Permanent Agricultural Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	-5	-\$216,324	-\$1,638,986
Indirect Effect	-4	-\$159,349	-\$310,903
Induced Effect	-1	-\$28,746	-\$105,492
Total Effect	-10	-\$404,420	-\$2,055,380

Note:

Income and output reported in 2015 dollars

Table 22C-20
Alternative C Local Permanent Agricultural Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	-5	-\$222,194	-\$1,666,382
Indirect Effect	-4	-\$162,618	-\$315,615
Induced Effect	-1	-\$29,444	-\$108,055
Total Effect	-10	-\$414,256	-\$2,090,053

Note:

Income and output reported in 2015 dollars

Table 22C-21
Alternative C Local Permanent Agricultural Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	-4.7	-\$222,194	-\$1,666,382
Indirect Effect	-5	-\$162,618	-\$315,615
Induced Effect	-4	-\$29,444	-\$108,055
Total Effect	-1	-\$414,256	-\$2,090,053

Note:

Income and output reported in 2015 dollars

22C.2.1.9 Local IMPLAN Model – Land Acquisition

The Project would increase economic activity related to land acquisition in the Primary Study Area. This regional economic impact would be temporary (Tables 22C-22, 22C-23, 22C-24, and 22C-25).

Land Acquisition Impact Summary Results

Table 22C-22
Alternative A Local Land Acquisition Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	15	\$679,105	\$2,259,643
Indirect Effect	1	\$43,864	\$149,707
Induced Effect	2	\$56,008	\$206,107
Total Effect	18	\$778,976	\$2,615,459

Note:

Income and output reported in 2015 dollars

Table 22C-23
Alternative B Local Land Acquisition Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	14	\$668,494	\$2,224,337
Indirect Effect	1	\$43,179	\$147,368
Induced Effect	2	\$55,133	\$202,887
Total Effect	17	\$766,806	\$2,574,591

Note:

Income and output reported in 2015 dollars

Table 22C-24
Alternative C Local Land Acquisition Impact Summary Results
Regional Economics Modeling

Impact Type	Employment	Labor Income	Output
Direct Effect	15	\$679,105	\$2,259,643
Indirect Effect	1	\$43,864	\$149,707
Induced Effect	2	\$56,008	\$206,107
Total Effect	18	\$778,976	\$2,615,459

Note:

Income and output reported in 2015 dollars

Table 22C-25
Alternative D Local Land Acquisition Impact Summary Results
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