

San Luis Low Point Improvement Project Environmental Impact Statement / Environmental Impact Report

Appendix G: Regional Economics IMPLAN Analysis

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Appendix G

Regional Economics IMPLAN Analysis

This appendix presents regional economic data from Impact Planning and Analysis (IMPLAN) (See Section G.1, Existing Conditions) and IMPLAN results for the San Luis Low Point Improvement Project (SLLPIP) Environmental Impact Statement /Environmental Impact Report (EIS/EIR) Alternatives (See Section G.2, Environmental Consequences/Environmental Impacts).

Regional economic data is presented at a county level, with data from the United States (U.S.) Census Bureau and IMPLAN 2014 data (see Section G.2 for a description of IMPLAN). IMPLAN data files are compiled annually from a variety of sources including, but not limited to, the U.S. Bureau of Economic Analysis, the U.S. Bureau of Labor, and the U.S. Census Bureau. Output represents the dollar value of industry production. Labor income is the dollar value of total payroll (including benefits) for each industry plus income received by self-employed individuals.

G.1 Existing Conditions

G.1.1 San Joaquin Valley Region

The Central Valley Project (CVP) and State Water Project (SWP) water service contractors within the San Joaquin Valley have service areas within Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties.

Table G-1 presents the regional economy for this entire region, followed tables for each individual county. Industry summaries are aggregated using IMPLAN’s default aggregation scheme which categorizes each Industry Sector into eight broad sector categories (MIG 2018).

Table G-1. San Joaquin Valley 2014 Regional Economy Summary (Fresno, Kern, Kings, Merced, San Joaquin, Stanislaus, and Tulare Counties)

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	244,649	\$36,579.8	\$14,700.4
Mining	20,672	\$12,847.9	\$2,503.8
Construction	83,509	\$14,268.1	\$4,278.3
Manufacturing	127,519	\$69,213.6	\$7,516.5

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Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
TIPU	92,081	\$25,931.4	\$6,232.2
Trade	233,472	\$28,185.6	\$9,810.3
Service	754,630	\$87,209.7	\$29,790.3
Government	268,377	\$28,581.5	\$21,528.1
Total	1,824,909	\$302,817.6	\$96,359.9

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

Table G-2. Fresno County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	58,143	\$7,985.6	\$3,259.9
Mining	739	\$225.2	\$54.9
Construction	19,758	\$3,346.9	\$1,005.2
Manufacturing	29,392	\$11,752.0	\$1,431.6
TIPU	23,228	\$9,330.2	\$1,783.0
Trade	58,385	\$7,182.1	\$2,519.1
Service	213,341	\$24,350.6	\$8,594.7
Government	67,308	\$6,821.5	\$5,248.7
Total	470,293	\$70,994.1	\$23,897.1

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

Table G-3. Kern County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	66,800	\$6,581.7	\$3,405.1
Mining	18,513	\$12,127.9	\$2,419.5
Construction	24,986	\$4,372.7	\$1,352.4
Manufacturing	17,871	\$16,616.9	\$1,158.8
TIPU	18,022	\$4,919.3	\$1,413.9
Trade	47,051	\$5,833.0	\$2,201.9
Service	160,981	\$19,233.2	\$6,697.6
Government	61,056	\$6,979.8	\$5,250.6
Total	415,280	\$76,664.5	\$23,899.8

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

Table G-4. Kings County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	7,771	\$2,364.4	\$765.0
Mining	158	\$29.6	\$0.0
Construction	1,261	\$220.8	\$67.6
Manufacturing	5,396	\$4,653.0	\$331.0
TIPU	1,577	\$372.4	\$98.2
Trade	5,634	\$574.7	\$209.1
Service	18,035	\$2,225.7	\$673.3
Government	18,437	\$2,780.2	\$1,482.9
Total	58,269	\$13,220.8	\$3,627.1

TIPU = Traffic, Information, and Public Utilities
Source: 2014 IMPLAN data; MIG 2016

Table G-5. Madera County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	15,404	\$2,592.6	\$923.4
Mining	306	\$58.9	\$1.0
Construction	2,299	\$381.8	\$105.9
Manufacturing	4,538	\$2,182.7	\$287.2
TIPU	2,073	\$538.0	\$125.8
Trade	5,783	\$646.1	\$230.6
Service	23,001	\$2,724.2	\$896.5
Government	9,897	\$1,047.0	\$744.4
Total	63,301	\$10,171.3	\$3,314.8

TIPU = Traffic, Information, and Public Utilities
Source: 2014 IMPLAN data; MIG 2016

Table G-6. Merced County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	17,273	\$4,070.2	\$1,405.4
Mining	238	\$53.3	\$3.7
Construction	3,494	\$597.5	\$177.1
Manufacturing	12,080	\$5,054.1	\$624.6
TIPU	4,402	\$1,000.2	\$222.7
Trade	11,640	\$1,238.3	\$427.5
Service	34,741	\$3,844.5	\$1,182.6
Government	17,850	\$1,718.1	\$1,362.0
Total	101,718	\$17,576.2	\$5,405.6

TIPU = Traffic, Information, and Public Utilities
Source: 2014 IMPLAN data; MIG 2016

Table G-7. San Joaquin County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	19,400	\$3,074.8	\$1,267.0
Mining	295	\$251.4	\$15.2
Construction	13,494	\$2,354.2	\$734.3
Manufacturing	18,957	\$9,106.6	\$1,245.0
TIPU	22,518	\$5,494.0	\$1,433.8
Trade	46,667	\$5,998.0	\$1,897.5
Service	133,970	\$15,617.4	\$5,204.0
Government	36,808	\$3,757.1	\$3,070.9
Total	292,108	\$45,653.5	\$14,867.7

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

Table G-8. Stanislaus County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	18,797	\$3,384.5	\$1,332.6
Mining	227	\$45.3	\$2.3
Construction	11,005	\$1,808.0	\$501.3
Manufacturing	25,223	\$12,459.5	\$1,640.3
TIPU	10,854	\$1,852.5	\$607.5
Trade	33,667	\$3,997.4	\$1,347.0
Service	103,626	\$12,008.6	\$4,305.0
Government	26,923	\$2,780.6	\$2,111.3
Total	230,322	\$38,336.4	\$11,847.3

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

Table G-9. Tulare County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	41,061	\$6,526.0	\$2,342.1
Mining	196	\$56.3	\$7.1
Construction	7,212	\$1,186.3	\$334.7
Manufacturing	14,062	\$7,388.8	\$798.0
TIPU	9,407	\$2,424.8	\$547.3
Trade	24,644	\$2,716.0	\$977.6
Service	66,935	\$7,205.6	\$2,236.7
Government	30,099	\$2,697.2	\$2,257.1
Total	193,616	\$30,201.0	\$9,500.6

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

G.1.2 Bay Area Region

The Bay Area region includes Alameda, Contra Costa, San Benito, and Santa Clara counties. CVP contractors in this region receive both irrigation and municipal and industrial (M&I) water supplies. Contractors in Alameda, Contra Costa, and Santa Clara counties receive and deliver CVP M&I deliveries and the San Benito County Water District in San Benito County receives and delivers CVP agricultural water to irrigation customers. SWP contractors in this region are in Santa Clara County and receive M&I water for delivery to urban customers within the county.

Table G-10 presents the regional economy for this entire region, followed by a table for each individual county. Industry summaries are aggregated using IMPLAN's default aggregation scheme which categorizes each Industry Sector into eight broad sector categories (MIG 2018).

Table G-10. Bay Area Region 2014 Regional Economy Summary (Alameda, Contra Costa, San Benito, and Santa Clara Counties)

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	8,885	\$952.8	\$486.3
Mining	4,494	\$2,014.4	\$422.7
Construction	138,083	\$26,911.0	\$9,336.8
Manufacturing	261,628	\$220,109.1	\$39,828.9
TIPU	181,681	\$90,934.7	\$30,514.9
Trade	335,661	\$57,105.6	\$22,937.2
Service	1,655,112	\$259,394.8	\$114,615.5
Government	245,056	\$29,853.2	\$24,554.6
Total	2,830,602	\$687,275.6	\$242,696.9

TIPU = Traffic, Information, and Public Utilities
Source: 2014 IMPLAN data; MIG 2016

Table G-11. Alameda County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	1,189	\$109.8	\$58.4
Mining	1,148	\$510.8	\$60.2
Construction	50,975	\$10,031.7	\$3,524.9
Manufacturing	70,692	\$39,675.2	\$7,010.5
TIPU	54,395	\$16,060.1	\$4,771.7
Trade	121,573	\$19,096.2	\$7,450.5
Service	557,504	\$80,865.9	\$33,730.0
Government	108,155	\$13,354.6	\$11,032.3
Total	965,630	\$179,704.3	\$67,638.5

TIPU = Traffic, Information, and Public Utilities
Source: 2014 IMPLAN data; MIG 2016

Table G-12. Contra Costa County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	1,490	\$133.8	\$62.2
Mining	1,344	\$798.2	\$310.8
Construction	32,317	\$6,240.9	\$2,141.1
Manufacturing	22,192	\$52,564.6	\$2,616.2
TIPU	30,498	\$15,763.7	\$3,556.8
Trade	64,118	\$7,919.8	\$3,066.8
Service	325,575	\$47,245.8	\$18,297.9
Government	46,720	\$5,305.7	\$4,290.4
Total	524,255	\$135,972.5	\$34,342.2

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

Table G-13. San Benito County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	2,416	\$316.2	\$142.3
Mining	33	\$7.7	\$1.1
Construction	1,476	\$234.8	\$60.1
Manufacturing	4,203	\$1,461.0	\$217.5
TIPU	717	\$121.3	\$41.3
Trade	3,618	\$422.2	\$166.4
Service	8,548	\$975.6	\$262.0
Government	2,661	\$322.6	\$233.6
Total	23,672	\$3,861.4	\$1,124.3

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

Table G-14. Santa Clara County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	3,790	\$393.1	\$223.5
Mining	1,968	\$697.7	\$50.6
Construction	53,316	\$10,403.6	\$3,610.8
Manufacturing	164,541	\$126,408.3	\$29,984.8
TIPU	96,071	\$58,989.6	\$22,145.0
Trade	146,352	\$29,667.4	\$12,253.5
Service	763,485	\$130,307.5	\$62,325.7
Government	87,520	\$10,870.2	\$8,998.3
Total	1,317,045	\$367,737.4	\$139,592.2

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

G.1.3 Southern California Region

The SWP water service contractors within the southern California Region are in Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura counties. Table G-15 presents household income and per capita income for the counties in the southern California region relative to California.

Table G-15. Southern California Region 2014 Households and Income

Households and Income	Los Angeles County	Orange County	Riverside County	San Bernardino County	San Diego County	San Luis Obispo County	Santa Barbara County	Ventura County	California
Number of Households	3,242,391	1,002,285	690,388	607,604	1,083,811	102,350	142,026	267,829	12,617,280
Average Household Size	3.02	3.04	3.24	3.34	2.85	2.52	2.91	3.07	2.77
Median Household Income (\$)	55,870	75,998	56,592	54,100	63,996	59,454	63,409	77,335	61,489
Mean Household Income (\$)	82,109	102,520	74,062	69,373	86,416	78,731	89,545	100,397	86,704
Per Capita Income (\$)	27,987	34,416	23,660	21,384	31,043	30,392	30,526	33,308	29,906

Source: U.S. Census Bureau 2016.

Table G-16 presents the regional economy for this entire region, followed by a table for each individual county. Industry summaries are aggregated using IMPLAN's default aggregation scheme which categorizes each Industry Sector into eight broad sector categories (MIG 2018).

Table G-16. Southern California 2014 Regional Economy Summary (Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura Counties)

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	92,908	\$9,530.8	\$4,945.0
Mining	32,989	\$18,160.7	\$3,816.0
Construction	584,098	\$103,138.5	\$31,535.3
Manufacturing	793,280	\$346,622.9	\$64,480.4
TIPU	777,108	\$274,817.4	\$69,024.8
Trade	1,663,383	\$230,900.9	\$84,372.3
Service	7,472,189	\$970,213.1	\$370,390.2
Government	1,407,464	\$184,560.7	\$128,538.0
Total	12,823,418	\$2,137,945.0	\$757,102.0

TIPU = Traffic, Information, and Public Utilities

Source: 2014 IMPLAN data; MIG 2016

Table G-17. Los Angeles County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	6,261	\$483.5	\$289.8
Mining	14,495	\$10,084.7	\$2,282.9
Construction	214,180	\$37,349.5	\$10,855.6
Manufacturing	381,831	\$177,906.6	\$30,013.8
TIPU	473,681	\$177,129.6	\$47,224.6
Trade	771,855	\$110,544.4	\$40,042.1
Service	3,669,340	\$471,973.7	\$185,770.0
Government	551,201	\$67,279.2	\$53,056.4
Total	6,082,843	\$1,052,751.2	\$369,535.2

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

Table G-18. Orange County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	2,877	\$324.1	\$174.5
Mining	6,171	\$2,437.3	\$380.5
Construction	111,224	\$21,160.1	\$7,430.7
Manufacturing	158,649	\$66,132.0	\$14,268.8
TIPU	69,036	\$28,809.5	\$6,082.1
Trade	280,090	\$43,885.0	\$16,818.1
Service	1,274,376	\$187,143.2	\$70,921.4
Government	150,248	\$16,687.8	\$13,754.7
Total	2,052,670	\$366,579.0	\$129,830.8

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

Table G-19. Riverside County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	14,400	\$1,619.8	\$706.9
Mining	1,780	\$464.7	\$127.9
Construction	71,143	\$11,837.6	\$3,332.3
Manufacturing	45,132	\$15,941.3	\$2,882.6
TIPU	48,214	\$10,987.9	\$2,518.2
Trade	133,246	\$15,235.9	\$5,285.5
Service	481,528	\$50,339.6	\$15,746.7
Government	130,911	\$16,694.6	\$10,961.4
Total	926,353	\$123,121.4	\$41,561.5

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

Table G-20. San Bernardino County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	3,451	\$803.7	\$230.8
Mining	1,338	\$437.8	\$67.1
Construction	48,073	\$8,147.6	\$2,293.5
Manufacturing	53,476	\$22,356.7	\$3,443.7
TIPU	79,062	\$15,799.6	\$4,540.4
Trade	136,936	\$17,442.6	\$5,881.8
Service	451,866	\$48,509.7	\$16,598.9
Government	133,774	\$16,660.7	\$11,229.8
Total	907,976	\$130,158.4	\$44,286.0

TIPU = Traffic, Information, and Public Utilities
Source: 2014 IMPLAN data; MIG 2016

Table G-21. San Diego County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	11,991	\$1,003.4	\$550.2
Mining	4,149	\$1,212.0	\$109.1
Construction	93,913	\$16,838.9	\$5,364.9
Manufacturing	102,968	\$41,869.5	\$9,616.4
TIPU	73,194	\$30,724.1	\$6,225.7
Trade	228,996	\$29,814.0	\$11,137.3
Service	1,129,199	\$156,144.8	\$61,438.9
Government	336,656	\$54,464.1	\$30,359.0
Total	1,981,064	\$332,070.8	\$124,801.5

TIPU = Traffic, Information, and Public Utilities
Source: 2014 IMPLAN data; MIG 2016

Table G-22. San Luis Obispo County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	7,242	\$1,000.3	\$394.1
Mining	644	\$142.5	\$18.5
Construction	11,169	\$1,946.4	\$578.3
Manufacturing	8,197	\$3,184.2	\$464.2
TIPU	8,270	\$3,207.7	\$665.0
Trade	21,049	\$2,260.0	\$811.2
Service	86,676	\$9,342.7	\$3,067.6
Government	20,334	\$1,884.8	\$1,634.4
Total	163,580	\$22,968.6	\$7,633.3

TIPU = Traffic, Information, and Public Utilities
Source: 2014 IMPLAN data; MIG 2016

Table G-23. Santa Barbara County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	20,570	\$2,070.1	\$1,147.4
Mining	2,081	\$1,546.5	\$309.8
Construction	12,235	\$2,116.6	\$630.3
Manufacturing	13,636	\$5,102.6	\$1,071.2
TIPU	10,255	\$3,150.8	\$769.2
Trade	28,977	\$3,530.0	\$1,378.4
Service	144,069	\$17,074.2	\$6,527.0
Government	37,423	\$4,900.4	\$3,272.2
Total	269,245	\$39,491.2	\$15,105.5

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

Table G-24. Ventura County 2014 Regional Economy Summary

Industry	Employment (Jobs)	Output (Million \$)	Labor Income (Million \$)
Agriculture	26,117	\$2,226.0	\$1,451.4
Mining	2,330	\$1,835.3	\$520.2
Construction	22,161	\$3,741.7	\$1,049.7
Manufacturing	29,392	\$14,130.1	\$2,719.8
TIPU	15,396	\$5,008.1	\$999.5
Trade	62,235	\$8,188.9	\$3,017.9
Service	235,136	\$29,685.2	\$10,319.7
Government	46,918	\$5,989.1	\$4,270.2
Total	439,686	\$70,804.4	\$24,348.4

TIPU = Traffic, Information, and Public Utilities
 Source: 2014 IMPLAN data; MIG 2016

G.2 Environmental Consequences/Environmental Impacts

This section describes the IMPLAN results for the SLLPIP Alternatives. Impacts to regional economics from Alternative 2, Alternative 3, Alternative 4 and Alternative 5 are discussed in this section. Impacts under Alternative 1, No Action/No Project are not discussed since No Action/No Project Alternative would be very similar to existing conditions and regional economics are not anticipated to experience substantive changes in the area of analysis.

This section only summarizes the Construction and Annual Expenditure Effects of the SLLPIP Alternatives. Recreation and M&I Water Supply impacts are analyzed qualitatively in this Environmental Impact Statement/ Environmental Impact Report (EIS/EIR) and not summarized in this Appendix. For the analysis of agricultural economic effects, the Statewide Agricultural Production Model (SWAP) estimates changes in value of production of crops as a result of

changes in water supply. Appendix R further described the SWAP agricultural economics model.

IMPLAN is an input-output (I-O) database and modeling software used to estimate economic impacts of changes in final demand or spending associated with the project alternatives. An I-O analysis describes and analyzes the relationship among industries.

Any given industry typically purchases goods and services from -- and sells goods and services to -- another industry within a given geographic area, which in turn, sells to or buys from other industries or supplies final consumers.

Figure H-1 shows the general flows of money between industries and consumers that is captured by IMPLAN.

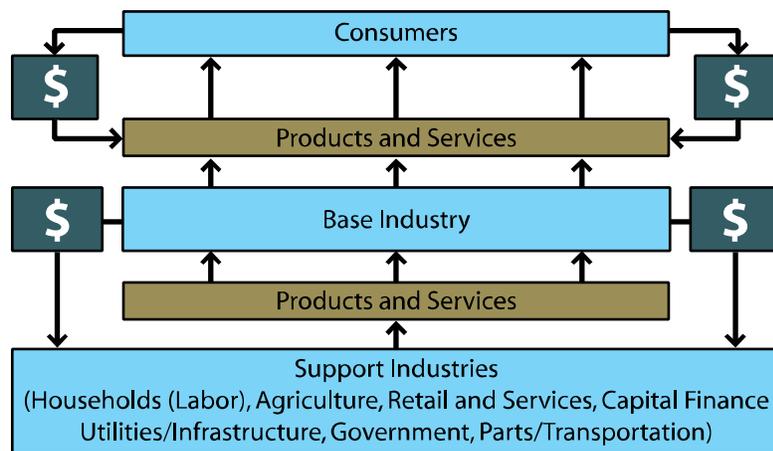


Figure H-1. Economic Linkages in a Hypothetical Industry

IMPLAN uses these inter-industry linkages and provides a tool to estimate the total economic effects within a region from a change in final demand to one economic sector. The industry linkages are estimated by economic multipliers (e.g., a multiplier of 2.0 indicates that each dollar of direct sale generates another dollar of secondary sales in the regional economy; a multiplier of 3.0 indicates that each dollar of direct sale generates an additional \$2 of secondary sales in the regional economy, and so on). Total economic effects include:

- **Direct effects** – changes in final demand
- **Indirect effects** – changes in expenditures within the region in industries supplying goods and services
- **Induced effects** – changes in expenditures of household income

This analysis presents estimates of impacts to value of output, labor income, and employment. The 2014 IMPLAN data sets were used for this analysis.

G.2.2 Environmental Consequences/Environmental Impacts of Alternative 2 - Lower San Felipe Intake Alternative

The majority of construction of the Lower San Felipe Intake Alternative would occur in Merced County. There would be some construction in Santa Clara County. Construction activities would create jobs and generate additional economic activity within the region during the period of construction.

The construction period for the Lower San Felipe Intake Alternative Tunnel Option would be 47 months. Estimated construction costs would be \$962.1 million. The majority of the cost would be for construction of waterways and waterway structures, which would require specialized underwater construction methods. Tunnel construction would occur 24 hours a day, 7 days a week. Program costs, including design, permitting, administrative and construction management, are also a major element of total project costs. There would be approximately 100 on-site construction workers during peak times. This analysis assumes 400 construction workers over the construction period. On-site construction does not include all direct labor for the project. There would be additional administrative, design, environmental compliance, management, and oversight jobs, as well as, truck drivers and equipment haulers. The level of project expenditures (\$962.1 million) would expectedly result in very high direct effects in output, employment and labor income. These direct effects would multiply through the regional economy and generate a high level of indirect and induced effects. Table G-25 summarizes regional economic effects related to construction expenditures for the tunnel option. These would be temporary beneficial economic effects in Merced and Santa Clara counties.

Table G-25. Direct, Indirect, Induced and Total Regional Economic Effects of Construction Expenditures for the Lower San Felipe Intake Alternative, Tunnel Option (2018 \$)

Impact Type	Employment (# jobs)	Labor Income (Million \$)	Output (Million \$)
Direct Effect	2,393	\$250.0	\$896.6
Indirect Effect	1,163	\$91.6	\$328.8
Induced Effect	840	\$52.6	\$213.1
Total Effect	4,396	\$394.3	\$1,438.5

Note: Totals may not add exactly because of rounding

The construction period for the Lower San Felipe Intake Alternative Pipeline Option would last 33 months, and would focus on installing as much of the pipeline as possible during low water periods. Work would be performed for 8 hours per day, 5 days a week. Estimated construction costs would be \$842.1 million. Similar to the tunnel option, the majority of the cost would be for construction of waterways and waterway structures and for program costs. There would be approximately 100 on-site construction workers during peak times. This analysis assumes 400 on-site construction workers over the

construction period. Project expenditures would result in additional direct jobs for design, environmental compliance and permitting, program and construction management, administrative, and other construction-related activities. Table G-26 summarizes regional economic effects related to construction expenditures for the tunnel option. These would be temporary beneficial economic effects in Santa Clara and Merced counties.

Table G-26. Direct, Indirect, Induced and Total Regional Economic Effects of Construction Expenditures for the Lower San Felipe Intake Alternative, Pipeline Option (2018 \$)

Impact Type	Employment (# jobs)	Labor Income (Million \$)	Output (Million \$)
Direct Effect	2,238	\$223.3	\$781.6
Indirect Effect	1,014	\$79.9	\$216.6
Induced Effect	746	\$46.7	\$275.2
Total Effect	3,998	\$350.0	\$1,273.4

Note: Totals may not add exactly because of rounding

The facilities would also require periodic repair and replacement, which would also generate employment, income, and output during the repairs and replacement period. The project life of facilities included in the Lower San Felipe Intake Alternative is approximately 50 years, depending on the facility; therefore, regional economic effects of repair and replacement would not occur for many years after the initial construction period. Regional economic effects of construction, repair, and replacement expenditures would be temporary and beneficial to Merced and Santa Clara counties.

Operations and maintenance (O&M) costs to implement the Lower San Felipe Intake Alternative would be \$2.5 million per year for the pipeline and tunnel options. These effects would be long-term and occur each year during project operation. Direct effects would occur in the water, sewage, and other treatment and delivery systems sector. Table G-27 summarizes regional economic effects of O&M expenditures for the Lower San Felipe Intake Alternative. Regional economic effects of O&M expenditures would be long-term and beneficial to Merced and Santa Clara counties.

Table G-27. Direct, Indirect, Induced and Total Regional Economic Effects of O&M Expenditures for the Lower San Felipe Intake Alternative (2018 \$)

Impact Type	Employment (# jobs)	Labor Income (Million \$)	Output (Million \$)
Direct Effect	15	\$1.3	\$2.4
Indirect Effect	3	\$0.2	\$0.3
Induced Effect	4	\$0.2	\$0.6
Total Effect	22	\$1.7	\$3.4

Note: Totals may not add exactly because of rounding

G.2.3 Environmental Consequences/Environmental Impacts of Alternative 3 - Treatment Alternative

The construction duration for treatment plant retrofits at the Santa Teresa Water Treatment Plant would be approximately 3 years. Construction would temporarily increase employment, output, and labor income in Santa Clara County. These effects would be temporary and occur over the 3 year construction period. Capital cost expenditures for the Treatment Alternative would be approximately \$37.0 million over the construction period. These costs include construction labor, materials, equipment, subcontractor costs, program costs, and contingency costs for environmental mitigation, overhead, insurance and bonds, sales tax and various allowances. There would be an average of approximately 24 on-site construction workers at the site. This analysis assumes a total of 90 on-site construction workers on site over the construction period. There would be additional direct jobs needed for program management, design, environmental compliance, and construction management. Table G-28 summarizes regional economic effects of construction expenditures for the Treatment Alternative.

Table G-28. Direct, Indirect, Induced and Total Regional Economic Effects of Construction Expenditures for the Treatment Alternative (2018 \$)

Impact Type	Employment (# jobs)	Labor Income (Million \$)	Output (Million \$)
Direct Effect	181	\$15.6	\$29.4
Indirect Effect	37	\$3.0	\$13.7
Induced Effect	44	\$2.8	\$19.4
Total Effect	263	\$21.5	\$62.6

Note: Totals may not add exactly because of rounding

The facilities would also require periodic repair and replacement, which would also generate employment, income, and output during the repairs and replacement period. The project life of facilities included in the Treatment Alternative is typically 20-50 years, depending on the facility; therefore, regional economic effects of repair and replacement would not occur for many years after the initial construction period. Regional economic effects of construction, repair, and replacement expenditures would be temporary and beneficial to Santa Clara County.

O&M costs to implement the Treatment Alternative would be approximately \$0.3 million per year. These costs include increased power demands, increased chemical demand and one additional full time O&M operator at the treatment plant. Increased power and chemical costs would not have a significant effect on the regional economy. There would be one additional direct job needed for increased O&M at the treatment plant. This additional job would result in some minor positive effects to the regional economy.

G.2.4 Environmental Consequences/Environmental Impacts of Alternative 4 - San Luis Reservoir Expansion Alternative

Increased water supplies for agricultural uses in the San Joaquin Region would increase value of production. Annual value of production would increase by about \$2.6 million in dry years, \$1.5 million in below normal and critical years, and \$1.2 million in wet years. Effects in below normal, critical and wet years would be less than those in dry years because modeling estimated that less water would be provided to agricultural water users in these hydrologic year types. Increased water supply would increase value of production and consequently increase employment, value added, labor income, and output in the crop sectors and the overall regional economy through indirect and induced impacts. This would be a minor positive effect to the regional agricultural economy.

The construction duration for San Luis Reservoir Expansion Alternative would be approximately 7 years. Construction activities associated with reservoir expansion would temporarily increase employment, output, and labor income in Merced County. Capital cost expenditures for the San Luis Reservoir Expansion Alternative would be approximately \$830.0 million over the construction period. These costs include construction labor, materials, equipment, subcontractor costs, program costs, and contingency costs for environmental mitigation, overhead, insurance and bonds, sales tax and various allowances. Construction would be conducted in two shifts, the day shift includes 130 workers at San Luis Reservoir and the night shift includes 87 workers. There would be additional direct jobs needed for program management, design, environmental compliance, and construction management. Table G-29 summarizes regional economic effects of construction expenditures for the San Luis Reservoir Expansion Alternative.

Table G-29. Direct, Indirect, Induced and Total Regional Economic Effects of Construction Expenditures for the San Luis Reservoir Expansion Alternative (2018 \$)

Impact Type	Employment (# jobs)	Labor Income (Million \$)	Output (Million \$)
Direct Effect	4,114	\$148.3	\$779.2
Indirect Effect	1,260	\$47.0	\$139.5
Induced Effect	637	\$24.5	\$83.3
Total Effect	6,011	\$219.8	\$1,002.0

Note: Totals may not add exactly because of rounding

G.2.5 Environmental Consequences/Environmental Impacts of Alternative 5 – Pacheco Reservoir Expansion Alternative

The construction duration for the Pacheco Reservoir Expansion Alternative would be approximately 120 months (5 years). Construction activities associated with reservoir expansion would temporarily increase employment,

output, and labor income in Merced and Santa Clara County. Capital cost expenditures for the Pacheco Reservoir Expansion Alternative would be approximately \$1,116.2 million over the construction period. These costs include construction labor, materials, equipment, subcontractor costs, program costs, and contingency costs for environmental mitigation, overhead, insurance and bonds, sales tax and various allowances. Construction would be conducted in two shifts, the day shift includes 350 workers at San Luis Reservoir and the night shift includes 125 workers. There would be additional direct jobs needed for program management, design, environmental compliance, and construction management. Table G-30 summarizes regional economic effects of construction expenditures for the Pacheco Reservoir Expansion Alternative.

Table G-30. Direct, Indirect, Induced and Total Regional Economic Effects of Construction Expenditures for the Pacheco Reservoir Expansion Alternative (2018 \$)

Impact Type	Employment (# jobs)	Labor Income (Million \$)	Output (Million \$)
Direct Effect	6,331	\$509.9	\$1,020.7
Indirect Effect	1,474	\$113.9	\$261.2
Induced Effect	1,495	\$93.6	\$249.0
Total Effect	9,301	\$717.4	\$1,531.0

Note: Totals may not add exactly because of rounding

G.3 References

Minnesota IMPLAN Group (MIG), Inc. 2016. IMPLAN 2014 data set.
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