

Final

Economic Impact Analysis for the PacifiClean Elk Heights Integrated Organics Processing Facility Kittitas County, Washington

Prepared for
PacifiClean Environmental, LLC

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Prepared by



CH2MHILL®

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Executive Summary

PacifiClean Environmental, LLC, proposes to construct and operate an organic processing facility known as the Elk Heights Integrated Organics Processing Facility Project on private land in Kittitas County, Washington. The facility is being developed on over 120 acres of land to provide organic materials processing for the Puget Sound region and small and large communities in Kittitas, Yakima, and surrounding counties. A primary objective of the project is to assist the region in significantly increasing the diversion of materials from landfills through source-separated organics processing. Construction of the project is expected to occur over an 8-year construction window with most of the construction assumed to occur in four phases during years 1, 3, 6 and 8. Commercial operation is expected to commence after completion of the construction of each phase. Operational capacity is expected to increase after construction of each phase until full capacity is reached at the end of the 8-year construction window. A summary of the total estimated capital costs for the project is provided in Table ES-1.

TABLE ES-1

Estimated Capital Costs of the Proposed Elk Heights Integrated Organics Processing Facility, 2012 Million Dollars

	Total Capital Cost	Total Materials Expenditure	Total Construction Payroll
Out of County	—	\$0	\$0
In-County (local)	—	\$28	\$7
Total	\$35	\$28	\$7

Source: PacifiClean, 2012.

This report provides a screening-level economic analysis of the project's impacts on Kittitas County and a regional economic analysis of the project's benefits to the county. The amounts shown are based on current estimates and are subject to change as the project definition evolves.

The annual capital costs for years 1, 3, 6 and 8 are estimated to be \$16 million, \$8 million, \$5.5 million, and \$5.5 million, respectively. Because the values for annual construction expenditures are within the range represented by the first and 6th (or 8th) year of the project construction window, the analysis presented in this report is based on two of the four years; years 1 and 8. As such, the construction phase impacts of the project are presented as a range of values with the impacts during year 8 providing the lower estimate and those during year 1 providing the upper estimate of the range.

Although operational capacity is expected to increase after construction of each phase until full capacity is reached at the end of the 8-year construction window, the operation phase impacts of the project are evaluated only at full project operational capacity.

Property and Sales Tax Effects

Kittitas County will benefit from substantial property and sales taxes collected during construction and operation of the project.

The total value of goods and services that will be purchased locally (within Kittitas County) during the 8-year construction window is estimated to be \$28 million. The total value of local purchases during years 1 and 8 are estimated to be \$6.4 million and \$4.4 million, respectively. The total value of goods and services that will be purchased locally during operation is estimated to be \$3,500,000 per year. Table ES-2 shows the resulting sales tax revenue in Kittitas County during construction and operation of the project, estimated to be \$1.1 million during construction and \$0.3 million annually during operations.

TABLE ES-2

Estimated Annual Sales Tax Revenue on Goods and Services During Construction and Operation, 2012 Dollars

	Construction	Operations
State	\$286,000 - \$832,000	\$228,000
County	\$66,000 - \$192,000	\$53,000
Total Annual Sales Tax Revenue from Project	\$352,000 - \$1,024,000	\$280,000
Percent Increase in County Sales Tax Revenues*	1.7% - 5.0%	0.5%

*Kittitas County fiscal year (FY) 2011–12 amended budget sales taxes were \$3,805,000.

Source: CH2M HILL, 2012; Kittitas County, 2012a.

In addition to the sales tax revenue generated during construction and operation, the project will also provide property tax revenues. The property tax rate is assumed to be \$8.245368 per \$1,000 of assessed value (Kittitas County, 2012b). Of the total annual property tax revenues of approximately \$289,000 generated by the project, approximately \$36,000 would go to the County while the remaining \$253,000 would go to the various taxing districts within the county. The annual property tax revenues generated during project operation represent about 4.4 percent of the total FY 2012 County property tax revenues. Table ES-3 shows the distribution of the estimated annual property tax revenue between the various taxing districts in Kittitas County.

TABLE ES-3

Estimated Annual Property Tax Revenue During Operation, 2012 Dollars

Taxing Districts	Operation (assuming \$36M capital cost)
State (Public Schools)	\$78,000
County Funds	\$36,000
County Road District No. 1	\$31,000
School District No. 400 Thorp M&O Levy	\$92,000
Fire District #1	\$38,000
Hospital District #1	\$11,000
Cemetery District No. 1	\$2,000
Total Annual Property Tax Revenue from Project	\$289,000
Percent Increase in County Property Tax Revenues*	4.4%

* Kittitas County FY 2011–12 amended budget property taxes were \$6,550,858.

Note: Numbers may not add up as a result of rounding.

Source: CH2M HILL, 2012; Kittitas County, 2012b.

Regional Income Effects

During the project construction phase, it is estimated that between \$5,170,000 and \$15,040,000 per year in income will be directly generated in Kittitas County during year 8 and year 1 from construction spending, respectively. In addition, it is estimated that another \$2,024,000 in secondary (indirect¹ and induced²) income will be generated annually for the County during year 1. Similarly, during operations, the annual operations and

¹ Indirect project impacts on the economy include income and employment impacts that result when entities that receive direct purchases from a project in turn purchase goods and services from their own suppliers and additional rounds of expenditures from suppliers continue to occur.

² Induced project impacts on the economy include income and employment impacts from employees directly or indirectly receiving income from the project and respending the income within the economy.

maintenance expenditures of \$5,215,000 will generate approximately \$898,000 in secondary income for the County. Table ES-4 provides an overall summary of project effects on income in the county.

TABLE ES-4
Summary of Annual Income Impacts, Kittitas County, 2012 Dollars

	Construction	Operations
Direct Income	\$5,170,000 - \$15,040,000	\$5,215,000
Indirect Income	\$602,000 - \$1,790,000	\$753,000
Induced Income	\$80,000 - \$234,000	\$146,000
Total Income	\$5,852,000 - \$17,064,000	\$6,114,000
Income Multiplier	1.1	1.2

Notes:

Numbers may not add as a result of rounding.

Income estimates are in 2012 dollars.

Employment Effects

As shown in Table ES-5, the direct average direct employment in Kittitas County during years 1 and 8 of the construction window is estimated to be between 41 and 120 full-time equivalent (FTE).³ Secondary (indirect and induced) employment in the County is estimated to be between 14 and 47 FTEs during years 1 and 8. In total, it is estimated that between 55 and 167 FTEs will be generated during 8th year when construction expenditures are the lowest and the 1st year when the construction related expenditures are the highest.

In addition to the direct employment of 35 staff, the operational phase of the project is estimated to result in secondary employment within Kittitas County of 10 FTE permanent jobs, resulting in a total of 45 long-term jobs in the county.

The employment multiplier associated with construction employment is calculated to be between 1.3 and 1.4. This means that for every one construction job provided by the project, between 0.3 and 0.4 FTE will be created in a support capacity. Similarly, the annual operation of the project will generate 45 long-term jobs in the county, with an employment multiplier of 1.3, or for every permanent job created by the project there will be just about 0.3 FTE in support services.

TABLE ES-5
Summary of Annual Employment Impacts, Kittitas County

	Construction	Operations
Direct Employment	41 - 120	35
Indirect Employment	12 - 40	6
Induced Employment	2 - 7	4
Total Employment	55 - 167	45
Employment Multiplier	1.3 - 1.4	1.3

Notes:

Numbers may not add as a result of rounding.

³ Data are calculated on an average annual basis.

Employment estimates are in FTE.

Economic Impact Analysis

1.0 Introduction

PacifiClean Environmental, LLC, proposes to construct and operate an organic processing facility known as the Elk Heights Integrated Organics Processing Facility Project on private land in Kittitas County, Washington. The facility is being developed on over 120 acres of land to serve the Puget Sound region and small and large communities in Kittitas, Yakima, and surrounding counties. A primary objective of the project is to assist the region in significantly increasing the diversion of materials from landfills through source-separated organics processing.

This report provides a fiscal and regional economic analysis of the project's effects on Kittitas County, Washington. Construction of the project is expected to occur over an 8-year construction window with most of the construction assumed to occur in four phases during years 1, 3, 6 and 8. Commercial operation is expected to commence after completion of the construction of each phase. Operational capacity is expected increase after construction of each phase until full capacity is reached at the end of the 8-year construction window.

2.0 Economic Setting

This section describes the existing economic setting and recent historical trends in Kittitas County, including employment, income, and fiscal resources. For purposes of this analysis, the regional area of influence is defined as Kittitas County.

2.1 Existing Economy and Employment

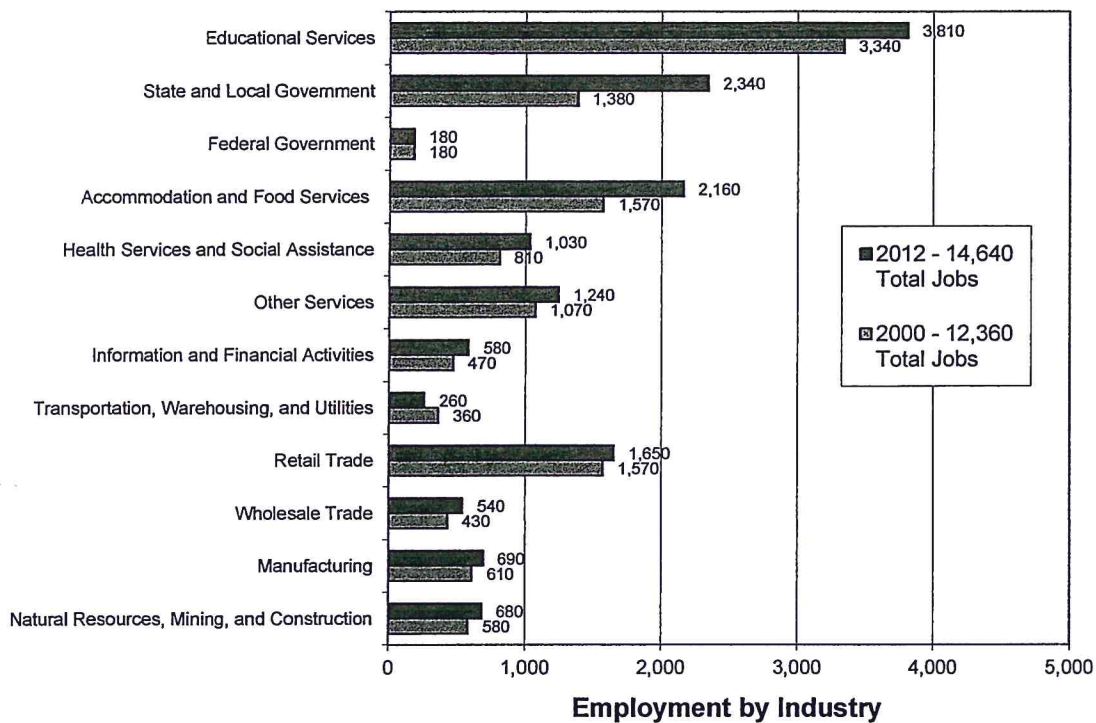
2.1.1 Employment by Industry

Figure 1 shows average employment by industry for Kittitas County. In 2000, an estimated 12,360 people were employed in the county. By 2012, average annual employment had increased approximately 18 percent to 14,640. Employment in the county is concentrated in the educational services, accommodation and food services, state and local government, and retail trade sectors. The educational services sector is dominated by activities at Central Washington University and accounts for approximately 26 percent of total employment in the county. Local and state government represents 16 percent of total employment, accommodation and food services represents nearly 15 percent, and the retail trade sector accounts for approximately 11 percent.

2.1.2 Unemployment

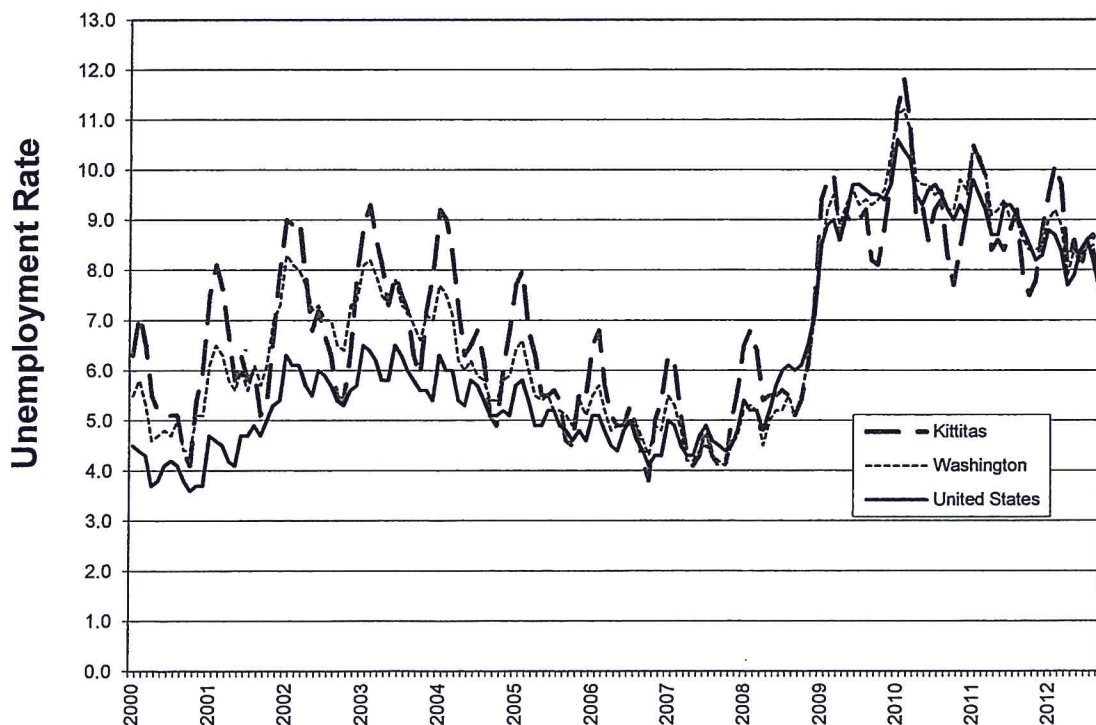
Recent unemployment rate trends for Kittitas County, the State of Washington, and the United States are shown in Figure 2. In general, the county's unemployment rate has trended higher than the state average, and has experienced greater volatility. By the end of 2000, the average unemployment rate for Kittitas County exceeded the state's rate by more than 2 percentage points: 6.0 percent versus 3.7 percent. During the strong economic growth period in 2005–2006, the county's unemployment rate dipped below the state's average for a short period. With the recent national economic recession, unemployment has risen in both the county and the state. The September 2012 unemployment rate for Kittitas County was lower than the unemployment rate for the state and the country. Kittitas County recorded an unemployment rate of 7.5 percent while Washington State and the United States reported rates of 7.7 percent and 7.6, respectively.

FIGURE 1
Average Annual Employment by Industry Sector, 2000 and 2012



Source: Washington State Employment Security Department, 2012.

FIGURE 2
Unemployment Rate for Kittitas County, Washington State, and the United States

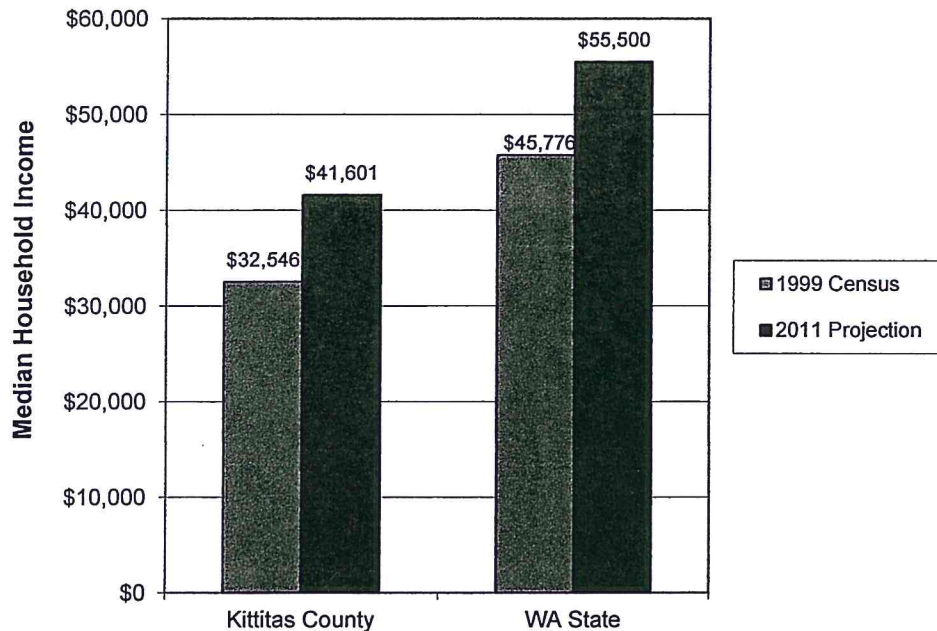


Source: U.S. Bureau of Labor Statistics, 2012.

2.2 Median Household Income

Figure 3 presents median household income data for Kittitas County and Washington State. From 1999 to 2011, median household income in the county increased approximately 28 percent from \$32,546 to \$41,601. Over the same period, median household income in Washington increased approximately 21 percent from \$45,776 to \$55,500.

FIGURE 3
Median Household Income



Source: Washington State Office of Financial Management, 2012.

2.3 Existing Fiscal Resources

This section describes Kittitas County general fund revenues and expenditures, assessed valuations, and sales tax revenues for the years 2009–2011.

2.3.1 General Fund Revenues and Expenditures

Kittitas County is the local agency with taxing power over the project. Revenues from property taxes are used to fund Kittitas County government, local school districts, county roads, local fire departments, libraries, and emergency medical services. These property tax revenues are also a major source of revenue for the local governments. Incorporated into the consolidated tax levy are local levies collected by the County Assessor and returned to local jurisdictions as general fund revenues.

Table 1 presents actual revenues and expenses for the Kittitas County general fund from 2009 to 2011. In 2011, the Kittitas County general fund had revenues of about \$21.5 million and expenses of approximately \$17.9 million. Approximately 55 percent of the revenue in 2011 came from taxes. Other sources of revenue included licenses and permits, fines and forfeits, and intergovernmental transfers. Property taxes were the largest contributors to revenues in 2011. Property taxes generated about \$7.1 million in revenues for the general fund, or nearly 33 percent of total revenue. Retail sales taxes totaled approximately \$4.0 million in 2011, providing approximately 18 percent of total revenues for the general fund.

TABLE 1
General Fund Revenues and Expenditures, 2009–2011

	2009	2010	2011
Beginning Fund Balance	\$8,774,232	\$4,217,897	\$5,585,779
Revenues			
Taxes			
Real and Personal Property Taxes	\$4,914,153	\$6,054,242	\$7,128,844
Retail Sales & Use Taxes	\$3,883,293	\$3,733,645	\$3,958,168
Other Taxes	\$460,664	\$693,871	\$1,913,640
Licenses and Permits	\$844,591	\$972,365	\$815,047
Intergovernmental	\$3,161,862	\$3,148,503	\$3,241,160
Charges for Services	\$1,940,023	\$2,180,557	\$2,008,253
Fines and Forfeits	\$1,691,276	\$1,624,908	\$1,597,951
Miscellaneous	\$1,146,307	\$763,759	\$862,231
Total Revenue	\$17,859,919	\$19,171,893	\$21,528,876
Expenditures			
General Governmental	\$6,372,296	\$6,345,529	\$8,689,993
Judicial	\$2,620,996	\$2,541,891	\$93,280
Security of Persons and Property	\$7,396,543	\$7,072,669	\$6,789,306
Physical Environment	\$111,777	\$78,475	\$193,600
Transportation	\$3,717	\$3,717	\$3,717
Economic Environment	\$987,275	\$656,058	\$669,587
Culture and Recreation	\$1,129,907	\$1,175,147	\$1,205,296
Debt Service	\$155,837	\$131,947	\$149,615
Capital Outlay	\$2,649,033	\$615,398	\$76,798
Total Expenditure	\$21,427,381	\$18,620,831	\$17,871,191
Excess (Deficit) Revenues	(\$3,718,354)	\$551,063	\$3,657,685
Other Financing Sources (Uses)	(\$147,220)	(\$281,211)	800,490
Net Change in Fund Balance	(\$3,865,574)	\$689,880	\$4,458,175
Ending Fund Balance	\$4,208,735	\$4,907,777	\$10,043,954

Note: Numbers in columns may not total because of rounding.

Source: Kittitas County, 2012c.

Table 2 presents the budgeted expenditures and revenues for 2011 and the adopted budget for 2012. In 2011 and 2012 property taxes are expected to account for approximately 34 and 33 percent of total revenues, respectively. Property tax revenues were budgeted to decrease slightly from \$6.7 million in 2011 to \$6.6 million in 2012 while retail sales taxes were expected to increase slightly. The County is expecting its total budget to increase by nearly \$1.0 million dollars from 2011 to 2012.

TABLE 2
General Fund Budgeted Revenues and Expenditures, 2011–2012

	2011 Budget	2012 Budget
Beginning Fund Balance	\$3,496,795	\$5,258,519
Revenues		
Taxes		
Real and Personal Property Taxes	\$6,719,786	\$6,550,858
Retail Sales & Use Taxes	\$3,575,000	\$3,805,000
Other Taxes	\$434,000	\$479,000
Licenses and Permits	\$850,946	\$790,390
Intergovernmental	\$2,935,265	\$3,689,359
Charges for Services	\$2,050,090	\$1,987,801
Fines & Penalties	\$1,761,400	\$1,695,667
Misc. Revenue	\$654,350	\$605,036
Non-Operating Revenues	\$589,437	\$191,437
Total Revenue	\$19,570,274	\$19,794,548
Expenditures		
Salaries and Benefits	\$13,079,889	\$13,676,361
Supplies	\$671,372	\$686,535
Charges for Services	\$4,133,592	\$4,514,265
Intergovernmental	\$1,156,661	\$996,402
Capital Outlay	\$492,010	\$178,876
Non-Operating Expenses	\$304,563	\$776,629
Total Expenditure	\$19,838,087	\$20,829,068
Ending Fund Balance	\$3,228,982	\$4,223,999

Note: Numbers in columns may not total because of rounding.

Source: Kittitas County, 2012a.

2.3.2 Assessed Value

According to the County Assessor, Kittitas County had an assessed value of approximately \$6.7 billion in 2011 (Kittitas County, 2012b). The 2010 average consolidated tax per thousand dollars of assessed value for the County was about \$9.95.

2.3.3 Sales Tax Revenue

The current (fourth quarter 2012) combined sales and use tax rate in Kittitas County is 8.0 percent (Washington State Department of Revenue [DOR], 2012a). The state sales and use tax accounts for 6.5 percentage points of the total sales and use tax rate and the remaining 1.5 percentage points goes to the County.

Recent trends in taxable retail sales in Kittitas County and Washington State are compared in Table 3. In 2007, retail sales in the county totaled approximately \$796 million. From 2007 to 2011, taxable retail sales in the county decreased at an average annual rate of 5 percent to approximately \$647 million. Over the same period, sales

statewide decreased at an annual rate of 3.4 percent. Both the county and the state experienced an increase in taxable retail sales from 2010 to 2011. This increase in retail sales is likely attributed to the overall modest recovery in the regional and national economies.

TABLE 3
Taxable Retail Sales (000s), 2007–2011

Area	2007	2008	2009	2010	2011	Average Annual Growth Rate
Kittitas County	795,557	740,684	630,405	618,901	646,913	-5.0%
Washington State	118,957,667	114,007,928	100,879,384	100,808,236	103,740,825	-3.4%

Source: DOR, 2012b.

3.0 Direct Project Impacts

3.1 Construction Impacts

Construction of the project is expected to occur over an 8-year construction window with most of the construction assumed to occur in four phases during in years 1, 3, 6 and 8. The annual capital costs for years 1, 3, 6 and 8 are estimated to be \$16 million, \$8 million, \$5.5 million, and \$5.5 million, respectively. The annual expenditures on materials are assumed to be 80 percent of the annual capital costs or \$12.4 million, \$6.4 million, \$4.4 million, and \$4.4 million respectively for years 1, 3, 6 and 8.

The construction impacts of interest in this analysis are those relating to direct changes in employment, income, and taxes. As such, the following discussion will evaluate the impacts of the changes in the above-listed variables for years 1 and 8 and will present the changes in these variables as a range.

For the following subsections, the number of construction workers that are likely to come from within Kittitas County during year 1 and year 8 is assumed to be 120 FTE and 41 FTE, respectively.

3.1.1 Construction Workforce

The project is expected to employ an average onsite annual workforce of between 41 and 120 FTE during each year of the construction window. The number of local workforce will be between 41 and 120, or about 0.3 to 0.8 percent of the county's total 2012 nonfarm employment of 14,640, and about 6 to 18 percent of the county's total employment in the natural resource, mining, and construction workforce sector (see Figure 1).

3.1.2 Sales Tax

The total value of project goods and services that will be purchased locally (within Kittitas County) during the 8-year construction window is estimated to be \$28 million. The value of local purchases during years 1 and 8 are estimated to be \$6.4 million and \$4.4 million, respectively. The effect on fiscal resources during construction will be from sales taxes realized on goods and services purchased in Kittitas County. The total annual sales tax expected to be generated during construction is estimated to be between \$352,000 and \$1,024,000 (8 percent of local sales). Of this amount, about \$66,000 to \$192,000 will go to Kittitas County. Table 4 summarizes the estimated annual sales tax revenue during construction.

TABLE 4
Estimated Annual Sales Tax Revenue on Goods and Services During Construction

	Annual Sales Tax Revenues
State	\$286,000 - \$832,000
County	\$66,000 - \$192,000
Total Annual Sales Tax Revenue from Project	\$352,000 - \$1,024,000

TABLE 4

Estimated Annual Sales Tax Revenue on Goods and Services During Construction

	Annual Sales Tax Revenues
Percent Increase in County Sales Tax Revenues*	1.7% - 5.5%

*Kittitas County fiscal year (FY) 2011–12 amended budget sales taxes were \$3,805,000.

Source: CH2M HILL, 2012; Kittitas County, 2012a.

Total sales tax revenue in Kittitas County in FY 2011–12 was \$3,805,000 (Kittitas County, 2012a). The annual sales tax revenue to Kittitas County during construction represents between 2 and 6 percent of the total sales tax revenue in FY 2011–12.

3.2 Operational Impacts

The operational impacts of interest are those relating to changes in employment and taxes. As such, the following discussion will evaluate the impacts of the changes in these variables.

The project is expected to begin commercial operation in 2014 after completion of the first phase of construction. Operational capacity is expected to increase after construction of each phase until full capacity is reached at the end of the 8-year construction window. Although the benefits from operations of the project are expected to commence in 2014 (after the completion of the first phase of construction), the operational analysis and results summarized in this report are those at full project operational capacity.

3.2.1 Operational Workforce

The total direct operational workforce is expected to consist of 35 full-time staff. It is expected that all of the operational workers will be drawn from the local workforce. Consequently, only a slight decrease in the county's unemployment is anticipated as a result of the project.

3.2.2 Property and Sales Tax

Project operation will generate a significant, long-term beneficial impact to County revenue. The greatest benefit will be derived from the payment of property taxes with a smaller contribution from sales tax revenue. The project will create sales tax revenue through local expenditures on goods and services. This section presents the property and sales tax impacts from operations-related purchases.

The project is located at 860 Thorp Prairie Road in Cle Elum in Kittitas County. The current levy rate for tax district 11 is \$8.245368 per \$1,000 of assessed value (Kittitas County, 2012b). Table 5 presents the breakdown of the levy rates for the affected tax district 11.

TABLE 5

Levy Rates for Tax District 11

Taxing District	Levy Rate (\$/1,000 Assessed Value)
State (Public Schools)	2.222759
County Funds	1.040321
County Road District No. 1	0.895963
School District No. 400 Thorp M&O Levy	2.633091
Fire District #1	1.088229
Hospital District #1	0.303748
Cemetery District No. 1	0.061257
Total	8.245368

TABLE 5

Levy Rates for Tax District 11

Taxing District	Levy Rate (\$/1,000 Assessed Value)
------------------------	--

Source: Kittitas County, 2012b.

Project costs were used to estimate potential fiscal impacts because the actual assessed value of the improvements are difficult to quantify at this time. When assessing property with improvements, the Kittitas County Assessor's office typically values the land first and then uses the Marshall Swift Cost Manual to estimate the value of the structures. The value so derived is then adjusted for market conditions through the use of comparable sales. However, the market adjustment may be difficult to do because there are no other organic processing facilities in the area.

In 2001, voters in Washington State overwhelmingly approved Initiative 747, which imposed a 1 percent cap on increases in state and local property tax collections. Assuming the parcels are assessed on the basis of the current land classification (current levy rate of 8.245368 per \$1,000 of assessed value) and using the total project capital cost of \$35 million, the assessed property tax revenues generated by the project would be approximately \$289,000 annually. Of this amount, about \$36,000 goes to Kittitas County while the remaining \$253,000 is distributed between the other taxing districts in the county. According to the 2012 amended budget (see Table 2), the total property tax revenues in Kittitas County in FY 2011–12 were \$6,550,858 (Kittitas County, 2012a). The annual property tax revenues generated during operation of the project represents about 4.4 percent of Kittitas County FY 2011–12 total property tax revenues. Thus, operation of the project will be beneficial to the economy of Kittitas County. Table 6 shows the distribution of the estimated annual property tax revenue between the various taxing districts in Kittitas County.

TABLE 6

Estimated Annual Property Tax Revenue During Operation

Taxing Districts	Operation (assuming \$35M capital cost)
State (Public Schools)	\$78,000
County Funds	\$36,000
County Road District No. 1	\$31,000
School District No. 400 Thorp M&O Levy	\$92,000
Fire District #1	\$38,000
Hospital District #1	\$11,000
Cemetery District No. 1	\$2,000
Total Annual Property Tax Revenue from Project	\$289,000
Percent Increase in County Property Tax Revenues*	4.4%

*Kittitas County FY 2011–12 amended budget property taxes were \$6,550,858.

Sources: CH2M HILL, 2012; Kittitas County, 2012b.

Assuming that the \$3.5 million in annual operational expenditures on materials are not exempt from sales tax and that the sales tax rate is 8 percent, the project will generate annual sales tax revenues of \$280,000. The annual sales tax revenues going to the county will be \$52,500, which is about 1.4 percent of the total sales tax revenues (\$3,805,000) in Kittitas County in FY 2011–12. Table 7 summarizes the estimated annual sales tax revenue during project operation.

TABLE 7

Estimated Annual Sales Tax Revenue on Goods and Services During Operation

	Annual Sales Tax Revenues
State	\$227,500
County	\$52,500
Total Annual Sales Tax Revenue from Project	\$280,000
Percent Increase in County Sales Tax Revenues*	1.4%

*Kittitas County FY 2011–12 amended budget sales taxes were \$3,805,000.

Source: CH2M HILL, 2012; Kittitas County, 2012a.

4.0 Secondary Project Impacts

Section 3.0 examined the project's direct impacts resulting from such factors as the payment of property taxes and the construction and operation expenditures within the county. This section discusses the indirect and induced impacts that the project will have on the county economy as a whole. The evaluation of indirect and induced impacts is achieved through regional economic analysis.

4.1 Regional Economic Impacts

Regional economics is the study of the economy of a small region. Regional economic impacts result from changes in the economy of the region. The magnitude of the economic impacts is determined by the interactions between linkages within the local and regional economy and the leakages from this economy to the larger economy.

4.1.1 Economic Linkage

Economic linkages are the relationships between industries, businesses, labor, household, and government created by trade and other exchange, such as taxes, within and among regions. Economic linkages create multiplier effects in a regional economy as money is circulated by trade. For example, suppose a construction company is paid \$50 million to construct a power plant. The construction company spends part of the \$50 million to purchase materials (such as concrete) and part to pay construction workers. The purchase of the materials constitutes a direct effect and will lead to increased output from the concrete manufacturing sector, which in turn will lead to increased output from the sectors that provide input into the concrete manufacturing sector such as the cement manufacturers or sand suppliers (as well as those sectors that provide inputs to the cement and sand, and so on). The increased expenditures on construction materials will have the effect of not only increasing output from sectors directly linked to the economic activity but those that supply the inputs to the directly affected sectors. The initial expenditure on materials (for example, cement) is typically referred to as the direct effect or impact. (These factors were described and analyzed in Section 3.0, Direct Project Impacts). The second set of impacts (those resulting from the purchases made by the directly affected sector) are referred to as the indirect effect or impact. The construction workers hired for the project spend part of their income to purchase food at the grocery store, which in turn pays for labor at the store and other inputs from the food suppliers. The impacts resulting from construction worker payroll expenditures are referred to as the induced effect or impact.

4.1.2 Economic Leakage

The magnitude of impacts resulting from economic linkages is limited by the amount of leakage that occurs within the region. Economic leakages are a measure of the income shares spent outside of the region. The more economic leakage, the less the multiplier effect. Conversely, the better a region is able to capture expenditures, the higher the multiplier effect. Economic leakages are generally higher the smaller the regional economy because the local region may not supply all of the needs of the project or its employees. For example, if one needs a new car, and there are no local car dealers, one may go to the next county to purchase a car. Therefore, the economic leakages for a county are larger than those for the state, which are larger than those for the nation.

4.1.3 Regional Modeling Systems

A number of regional economic analysis modeling systems (consisting of data as well as analytical software) are available for use in regional economic analysis, for example, REMI (Regional Economic Models Inc.), RIMS II (Regional Industrial Multiplier System II), and IMPLAN (IMpact Analysis for PLANning). IMPLAN is a computer database and modeling system used to create input-output (I-O) models for any combination of U.S. counties. For this study, IMPLAN was selected because it has a current database and is readily available.

The IMPLAN package includes: (1) estimates of final demands and final payments developed from government data, (2) a national average matrix of technical coefficients, (3) mathematical tools that help the user structure the I-O model, and (4) tools that allow the user to input more accurate data or add data refinement, conduct impact analysis, and generate reports.

Sections 4.2 and 4.3 describe the regional economic impacts associated with the construction and operation of the project, respectively. Because the duration of the construction and operational phases of the project are different, the impacts are separately evaluated and presented for each phase of the project.

4.2 Construction Phase Impacts

An IMPLAN I-O model of the Kittitas County economy was constructed. For this analysis, the following assumptions were made:

- The region of influence for the economic impact analysis is Kittitas County, Washington.
- Elk Heights Organics Processing Facility Project will be constructed over an 8-year window with most of the construction assumed to occur in four phases during in years 1, 3, 6 and 8.
- The construction phase analysis presented in this report is for years 1 and 8, respectively, as expenditure patterns in these two years is assumed to represent the upper and lower end of the range of values for project expenditures during the construction phase of the project.
- The annual average onsite workforce will be 120 FTE during year 1 and 41 FTE during year 8, including subcontractors, during each year of construction.
- All of the construction workers are assumed to be from the local labor market (within Kittitas County).
- Annual expenditures on construction materials and supplies is assumed to be 80 percent of the total project capitals costs while annual construction payroll is assumed to be 20 percent of the total project capital costs.
- Disposable labor income is 70 percent of total labor income. This means that 30 percent of gross income is used for taxes and savings.
- Construction of the first phase is anticipated to begin in 2013 with the final phase construction expected to be complete within the 8-year construction window.
- The base year of analysis is 2007,¹ but the impacts were adjusted to reflect year 2012 price levels because all project costs are in 2012 dollars.

Table 8 shows the capital cost, materials costs, and labor costs for the project split by estimated costs assumed to be spent with Kittitas County (local) and those assumed to be spent outside the county. Because engineering design on the project is at a preliminary level, the cost estimates used in this analysis are also at a preliminary level.

The total capital costs for the project is \$35 million, in 2012 dollars. Expenditures on materials are estimated to be \$28 million while construction payroll is expected to be \$7 million. The local (within Kittitas County) portion of the construction expenditures on materials and labor are \$28 million and \$7 million, respectively.

¹ Available IMPLAN data.

TABLE 8

Estimated Capital Cost of the Proposed Elk Heights Organics Processing Facility, 2012 Million Dollars

	Total Capital Cost	Total Materials Expenditure	Total Construction Payroll
Out of County	—	\$0	\$0
In-County (local)	—	\$28	\$7
Total	\$35	\$28	\$7

Source: PacifiClean, 2012.

The annual capital costs for years 1, 3, 6 and 8 are estimated to be \$16 million, \$8 million, \$5.5 million, and \$5.5 million, respectively. The annual expenditures on materials are assumed to be 80 percent of the annual capital costs or \$12.4 million, \$6.4 million, \$4.4 million, and \$4.4 million respectively for years 1, 3, 6 and 8. The annual construction payroll for years 1, 3, 6 and 8 are assumed to be \$3.2 million, \$1.6 million, \$1.1 million and \$1.1 million, respectively.

Because the values for annual construction expenditures are within the range represented by the first and 6th (or 8th) year of the project construction window, the analysis presented in this report is based on two of the four years; years 1 and 8. As such, the construction phase impacts of the project are presented as a range of values with the impacts during year 8 providing the lower estimate and those during year 1 providing the upper estimate of the range.

Given that regional indirect and induced economic impacts arise from the infusion of “exogenous” or outside dollars into the local economy, only the portion of the expenditures on labor for the relocated workers and the local expenditures on goods and services are used to evaluate the economic impacts of expenditures on construction goods and services, and labor. For this analysis, the portion of the expenditures on labor was assumed to be the disposable portion of the income received by the labor assumed to move into the county, while the local portion of the expenditures on materials was assumed to be the entire amount. The total local expenditures on materials and the total local labor local cost for the project are shown in Table 8.

Table 9 shows the results of the regional economic impact analysis of the construction phase of the project. As the numbers in the table show, in addition to the average annual direct employment of 41 to 120, the construction phase of the project will result in secondary (indirect and induced) employment within Kittitas County. Along with the average annual direct 41 to 120 construction jobs, the total estimated annual secondary (indirect and induced) employment will be between 14 and 47. Assuming an average annual direct construction employment of 41 to 120, the employment multiplier associated with the construction phase is 1.3² or 1.4.³ This project construction phase employment multiplier is based on a Type Social Accounting Matrix (SAM) model.

Assuming the construction expenditures for year 1, the annual estimated indirect and induced income within the region will be about \$1,790,000 and \$234,000, respectively. Assuming a total annual local construction expenditure (payroll, goods and services) of about \$15,040,000 (\$2,240,000⁴ in disposable payroll and \$12,800,000 in goods and services), the project’s construction phase income multiplier based on a Type SAM model is approximately 1.1.⁵

² The 1.3 employment multiplier is derived as [41 construction jobs + 12 indirect jobs + 2 induced jobs]/41.

³ The 1.4 employment multiplier is derived as [120 construction jobs + 38 indirect jobs + 7 induced jobs]/120.

⁴ The \$2,240,000 is assumed to be 70 percent of the annual local construction payroll in year 1 of \$3.2 million.

⁵ The 1.1 income multiplier is derived as [\$15,040,000 in annual local construction income from expenditures + \$1,790,000 indirect income + \$234,000 induced income]/\$15,040,000.

Assuming the construction expenditures for year 8, the annual estimated indirect and induced income within the region will be about \$602,000 and \$80,000, respectively. Assuming a total annual local construction expenditure (payroll, goods and services) of about \$5,170,000 (\$770,000⁶ in disposable payroll and \$4,400,000 in goods and services), the project's construction phase income multiplier based on a Type SAM model is approximately 1.1.⁷

Because of the short-term nature of construction, the regional economic impacts associated with the construction of the proposed project are temporary.

TABLE 9

Estimates of Annual Direct, Indirect, and Induced Impacts Associated with the Construction of Proposed Elk Heights Organics Processing Facility

	Employment
Direct	41 - 120
Indirect	12 - 40
Induced	2 - 7
Total	55 - 167
Employment Multiplier	1.3 to 1.4
	Income
Direct	\$5,170,000 - \$15,040,000
Indirect	\$602,000 - \$1,790,000
Induced	\$80,000 - \$234,000
Total	\$5,852,000 - \$17,064,000
Income Multiplier	1.1

Notes:

Numbers may not add as a result of rounding.

Employment estimates are in FTE.

Income estimates are in 2012 dollars.

4.3 Operations Phase Impacts

The project is expected to begin operations after the completion of each phase of construction. The costs associated with the operation and maintenance (O&M) phase of the project relate to labor and materials at full operational capacity. Operations labor is assumed to be local. For the regional economic impact analysis, the expenditures on locally purchase goods and services and the payroll for the relocated labor are used. Table 10 shows the annual O&M costs.

TABLE 10

Annual Operations and Maintenance Cost of Proposed Elk Heights Organics Processing Facility, 2012 Dollars

Costs	In-County
Labor	\$2,450,000
Materials	\$3,500,000

⁶ The \$770,000 is assumed to be 70 percent of the annual local construction payroll in year 8 of \$1.1 million.

⁷ The 1.1 income multiplier is derived as [$\$5,170,000$ in annual local construction income from expenditures + $\$602,000$ indirect income + $\$80,000$ induced income]/ $\$5,170,000$.

TABLE 10

Annual Operations and Maintenance Cost of Proposed Elk Heights Organics Processing Facility, 2012 Dollars

Costs	In-County
TOTAL	\$5,950,000

Source: PacifiClean, 2012.

Table 11 shows the annual regional economic impacts of the O&M expenditures on labor and materials. As the numbers in the table show, in addition to the direct employment of 35 staff resulting from the local O&M payroll expenditures, the operational phase of the project will result in secondary (indirect and induced) employment within Kittitas County. Thus, the estimated annual indirect and induced employment within Kittitas County will be about 6 and 4 jobs, respectively. Assuming an average annual direct operational phase employment of 35, the employment multiplier associated with the operations phase is about 1.3.⁸ This construction phase employment multiplier is based on a Type Social Accounting Matrix (SAM) model.

The annual estimated indirect income within the region will be \$753,000 while the annual estimated induced income will be \$146,000. Assuming a total annual local operations expenditure (payroll, goods and services) of about \$5,215,000 (\$1,715,000 in payroll and \$3,500,000 in goods and services), the project's operations phase income multiplier based on a Type SAM model is approximately 1.2.⁹

TABLE 11

Estimates of Annual Direct, Indirect, and Induced Impacts Associated with the Operational Phase of the Proposed Elk Heights Organics Processing Facility

	Employment
Direct	35
Indirect	6
Induced	4
Total	45
Employment Multiplier	1.3
	Income
Direct	\$5,215,000
Indirect	\$753,000
Induced	\$146,000
Total	\$6,113,000
Income Multiplier	1.2

Notes:

Numbers may not add as a result of rounding.

Employment estimates are in FTE.

Income estimates are in 2012 dollars.

⁸ The 1.3 employment multiplier is derived as $[35 \text{ operation jobs} + 6 \text{ indirect job} + 4 \text{ induced jobs}] / 35 \text{ operation jobs}$.

⁹ The 1.2 income multiplier is derived as $[\$5,215,000 \text{ in annual local operation income from expenditures} + \$753,000 \text{ in indirect income} + \$146,000 \text{ in induced income}] / \$5,215,000$.

Because of the long-term nature of operations, the regional economic impacts associated with project operation are expected to last at least 30 years. However, these annual economic impacts are likely to change if the underlying economic linkages and leakages that produced them change over the course of project operations.

Using an annual discount rate of 5 percent and assuming that the project is operational for at least 30 years, the total additional income expected to be generated within Kittitas County is estimated to be approximately \$94 million in 2012 dollars.

5.0 References

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