



**Tesoro Savage
Vancouver Energy Distribution Terminal
Socio-Economic Analysis
EFSEC Application No. 2013-01**

PREPARED BY

BST Associates
PO Box 82388
Kenmore, WA 98028-0388
(425) 486-7722
bstassoc@seanet.com

Revised November 25, 2013

CONTENTS

1.0	Overview of IMPLAN Model.....	1
1.1	Inputs to Project IMPLAN Model.....	1
1.1.1	Construction.....	2
1.1.2	Operation.....	3

LIST OF TABLES

Table K-1.	Estimate of Construction Trades and Compensation	2
Table K-2.	Economic Impacts from Construction.....	3
Table K-3.	Estimated Employment and Compensation from Operations	4
Table K-4.	Economic Impacts from Operations.....	4
Table K-5.	State and Local Taxes from Construction	5
Table K-6.	State and Local Taxes from Operations	6

LIST OF ACRONYMS & ABBREVIATIONS

B & O – Washington State Business and Occupation tax

EFSEC – Energy Facility Site Evaluation Council

IMPLAN – Impact Analysis for Planning input-output model from MIG, Inc.

MSA – Metropolitan Statistical Area

OEA - and Oregon Office of Economic Analysis

OFM - Washington Office of Financial Management

SAMs - Social Accounting Matrices

WAC - Washington Administrative Code

1.0 OVERVIEW OF IMPLAN MODEL

The economic impacts of the Tesoro Savage Vancouver Energy Distribution Terminal (Project) were estimated using IMPLAN software. IMPLAN is econometric modeling software that uses Social Accounts that describe the structure and function of a specific economy, and is used to create a localized model to investigate the consequences of projected economic transactions in a geographic region.

IMPLAN's Social Accounting Matrices (SAMs) capture the actual dollar amounts of all business transactions taking place in a regional economy as reported each year by businesses and governmental agencies. SAM accounts are a better measure of economic flow than traditional input-output accounts because they include "non-market" transactions. Examples of these transactions would be taxes and unemployment benefits.

This IMPLAN software guides users through the task of creating an impact study which will track the effects of a modeled event on 440 unique sectors in the United States. The result is a detailed summary of economic impacts including changes in jobs, household incomes, tax impacts, and gross regional product.

SAMs can be constructed to show the effects of a given change on the economy of interest. These are called Multiplier Models. Multiplier Models study the impacts of a user-specified change in the chosen economy for 440 different industries. Because the Multiplier Models are built directly from the region specific SAMs, they will reflect the region's unique structure and trade situation.

Multiplier Models are the framework for building impact analysis questions. Derived mathematically, these models estimate the magnitude and distribution of economic impacts, and measure three types of effects which are displayed in the final report. These are the direct, indirect, and induced changes within the economy. Direct effects are determined by the Event as defined by the user (i.e. a \$10 million dollar order is a \$10 million dollar direct effect). The indirect effects are determined by the amount of the direct effect spent within the study region on supplies, services, labor and taxes. Finally the induced effect measures the money that is re-spent in the study area as a result of spending from the indirect effect.

1.1 Inputs to Project IMPLAN Model

Three scenarios were created in IMPLAN to estimate the economic impacts of Project implementation:

- Construction,
- Initial operations (in 2016), and
- Operations at full build-out/operating capacity (in 2036)¹.

For each of these scenarios, the study area was defined as the counties that are located within a one-hour commute distance of the Project site, as per WAC 463-60-535. This included three

¹ As described in Section 2.3 of the Application for Site Certification, the Applicant may defer construction of some of the Project facilities based on market demand, however the capacity for receiving an average 360,000 barrels per day will be present even if the deferred elements are not constructed; for purposes of the socioeconomic assessment full build-out/operating capacity assumed all Project elements were constructed and the Facility is operating at full capacity.

counties in Washington (Clark, Skamania, and Cowlitz) and seven counties in Oregon (Clackamas, Columbia, Hood River, Marion, Multnomah, Washington, and Yamhill).

1.1.1 Construction

As described in Section 4.4 Socioeconomic Impact, construction of the Project is expected to pay wages higher than the study area average. Because the Project is located on public property, this analysis assumes that the Project is subject to the Davis-Bacon act and must pay local prevailing wages. Average hourly wages were based on *2013 Occupational Employment and Wage Estimates*² for Clark County, for each of the trades expected to be used on the Project. The analysis also assumes that a share of the jobs in each trade will be filled by apprentices who make lower wages than journeymen, and the wages were adjusted to account for this.

The hourly wage was converted into a fully-loaded hourly rate (including wages and benefits), and then the annual compensation per job was calculated assuming 2,080 hours per year per worker. Because construction of the Project is expected to last less than one year and the number of workers from each trade needed will vary through the Project, the actual amount earned will vary substantially among the individual workers. Overall, a total of 250 workers are expected to be employed during construction, with total compensation of \$8,961,986.

Table K-1 presents details on the distribution of workers projected to be used on Project construction. Based on a weighted average of \$45.96 per hour (including wages and benefits) and a 2,080 hour work year, average compensation per worker is \$95,595 per year. The average number of workers on site is projected to be 125, and the construction period is expected to last nine months, or three-quarters of one year. Multiplying the average number of workers, the average annual compensation, and the construction period of three-quarters of one year, total compensation for construction workers is estimated to be \$8,961,986.

Table K-1. Estimate of Construction Trades and Compensation

Trade	Quantity	% of Project Workforce	Journeyman	Apprentice	Weighted Average
Mechanical	50	20	\$54.42	\$41.63	\$52.50
Electrical	35	14	\$48.25	\$36.75	\$46.53
Operating Engineers	25	10	\$47.15	\$42.03	\$46.39
Labors	53	21	\$38.66	\$31.03	\$37.52
Iron Workers	32	13	\$54.98	\$45.71	\$53.59
Carpenters	20	8	\$47.13	\$36.52	\$45.53
Concrete	15	6	\$47.74	\$39.81	\$46.55
Tank Erectors	20	8	\$38.79	\$34.96	\$38.22
	250				\$45.96
Share of workforce			85%	15%	

Source: Washington State Employment Security Department, Project Applicant

The IMPLAN model for Project construction used the following inputs:

² *2013 Occupational Employment and Wage Estimates*, Washington State Employment Security Department, June 2013

- Construction year: 2014
- Number of workers: 250
- Worker compensation: \$8,961,986.

The results of the IMPLAN analysis for construction are presented in Table K-2. Direct employment of 250 is projected to support an additional 517 indirect and induced jobs. The total number of jobs supported by Project construction is estimated to be 767. Direct labor income of \$21.2 million is projected to support an additional \$26.7 million in labor income. Total labor income supported by the Project is projected to be \$47.9 million.

Table K-2. Economic Impacts from Construction

Impact Type	Employment	Labor Income (\$millions)
Direct	250	\$21.2
Indirect & Induced	517	\$26.7
Total	767	\$47.9

Note: Compensation and labor income are reported in 2013 dollars
 Source: Tesoro Savage, BST Associates using IMPLAN model

1.1.2 Operation

When the Project is in operation, the total compensation earned by works is likely to be relatively high, when compared with the study area. At start-up in 2016, the Project is estimated to generate a total of 151 jobs, and this is projected to grow to 295 jobs at full operation in 2036. Total compensation (including wages and benefits) is estimated to be \$112,880 at start-up, and to grow to \$118,710 in 2036.

The majority of the jobs at start-up will be Project workers. Based on the *2013 Occupational Employment and Wage Estimates*, workers in industry 537121 (Car, Truck, & Ship Loaders) in Washington State earn an average of \$64,461 per year. Assuming a total benefit package equal to 50 percent of wages, total compensation per worker is estimated to be \$96,691 per year.

In addition to the terminal workers, the Project will directly create the need for various transportation-related jobs, including ships pilots, longshore workers, ship assist tugboats, and railroad crews. The need for railroad transportation will increase as the volume of product handled through the facility grows, and the number of railroad jobs associated with the Project is projected to grow from 58 at start-up to 151 at full build-out.

The average pay for the jobs associated with operations is likely to be substantially higher than the study area average. In addition to the compensation for terminal workers (described above), the compensation associated with other direct jobs are higher than average. For example, average total compensation for rail workers is \$118,790 per year, according to data from the Association of American Railroads. For ship pilots the compensation is much higher, averaging approximately \$300,000 per year, according to formulas used by the Oregon Board of Maritime Pilots.

Table K-3 presents that inputs used in the IMPLAN models for operations in 2016 and 2036.

Table K-3. Estimated Employment and Compensation from Operations

Type of Worker	IMPLAN Industry Code	Start-up (2016)			Full Build-out (2036)		
		Number	Total Compensation	Average Income	Number	Total Compensation	Average Income
Terminal workers		80	\$7,735,320	\$96,692	110	\$10,636,065	\$96,692
Longshore		2	\$368,134	\$189,077	5	\$959,778	\$189,077
Pilots - Bar		1	\$427,406	\$299,998	4	\$1,114,307	\$299,998
Pilots - River		4	\$1,234,020	\$302,151	11	\$3,217,267	\$302,151
Tug ship assist		6	\$406,713	\$71,369	15	\$1,060,360	\$71,369
Rail Transportation		58	\$6,909,625	\$118,790	151	\$17,900,012	\$118,790
Total		151	\$17,081,219	\$112,880	296	\$34,887,789	\$118,710

Note: Compensation and average income are reported in 2013 dollars; number of jobs is rounded to nearest whole number

Source: Tesoro Savage, BST Associates

The results of the IMPLAN analysis for operations are presented in Table K-4. In the first year of operation (2016), direct employment of 151 at the Project is estimated to support 265 additional jobs in the study area, or a total of 416 jobs. At full operation (in 2036), direct employment of 296 is projected to support an additional 375 jobs in the study area, or a total of 672.

Direct income of \$16.9 million at start-up is projected to support an additional \$13.2 million of income in the study area, or a total of \$30.0 million. At full build-out, direct income of \$33.8 million is projected to support an additional \$18.0 million in the study area, or a total of \$51.8 million.

Table K-4. Economic Impacts from Operations

Impact Type	Start-up (2016)		Full Build-out (2036)	
	Employment	Labor Income (\$millions)	Employment	Labor Income (\$millions)
Direct	151	\$16.9	296	\$33.8
Indirect & Induced	265	\$13.2	375	\$18.0
Total	416	\$30.0	672	\$51.8

Note: Compensation and labor income are reported in 2013 dollars

Source: Tesoro Savage, BST Associates

Table K-5 presents the detailed IMPLAN tax estimates related to construction. According to the IMPLAN model, total state and local taxes resulting from construction are estimated to be approximately \$4.9 million.

Table K-5. State and Local Taxes from Construction

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Start-up in 2016					
Dividends				\$7,602	\$7,602
Social Ins Tax- Employee Contribution	\$12,791				\$12,791
Social Ins Tax- Employer Contribution	\$22,675				\$22,675
Tax on Production and Imports: Sales Tax		\$2,078,565			\$2,078,565
Tax on Production and Imports: Property Tax		\$1,367,732			\$1,367,732
Tax on Production and Imports: Motor Vehicle Lic		\$47,909			\$47,909
Tax on Production and Imports: Severance Tax		\$6,442			\$6,442
Tax on Production and Imports: Other Taxes		\$341,231			\$341,231
Tax on Production and Imports: S/L NonTaxes		\$195,140			\$195,140
Corporate Profits Tax				\$46,557	\$46,557
Personal Tax: Income Tax			\$510,818		\$510,818
Personal Tax: NonTaxes (Fines- Fees)			\$189,330		\$189,330
Personal Tax: Motor Vehicle License			\$68,529		\$68,529
Personal Tax: Property Taxes			\$19,630		\$19,630
Personal Tax: Other Tax (Fish/Hunt)			\$30,086		\$30,086
Total State and Local Tax	\$35,467	\$4,037,019	\$818,392	\$54,158	\$4,945,036

Note: all dollar figures are reported in 2013 dollars

Source: BST Associates using IMPLAN model

Table K-6 presents the detailed IMPLAN tax estimates related to operations in 2016 and 2036. Total state and local taxes are estimated to grow from approximately 4.0 million in 2016 (in 2013 dollars) to \$5.2 million in 2036.

Table K-6. State and Local Taxes from Operations

Description	Employee Compensation	Tax on Production and Imports	Households	Corporations	Total
Start-up in 2016					
Dividends				\$6,019	\$6,019
Social Ins Tax- Employee Contribution	\$11,162				\$11,162
Social Ins Tax- Employer Contribution	\$19,788				\$19,788
Tax on Production and Imports: Sales Tax		\$1,786,389			\$1,786,389
Tax on Production and Imports: Property Tax		\$1,175,475			\$1,175,475
Tax on Production and Imports: Motor Vehicle Lic		\$41,175			\$41,175
Tax on Production and Imports: Severance Tax		\$5,536			\$5,536
Tax on Production and Imports: Other Taxes		\$293,265			\$293,265
Tax on Production and Imports: S/L NonTaxes		\$167,710			\$167,710
Corporate Profits Tax				\$36,862	\$36,862
Personal Tax: Income Tax			\$312,982		\$312,982
Personal Tax: NonTaxes (Fines- Fees			\$116,004		\$116,004
Personal Tax: Motor Vehicle License			\$41,988		\$41,988
Personal Tax: Property Taxes			\$12,027		\$12,027
Personal Tax: Other Tax (Fish/Hunt)			\$18,434		\$18,434
Total State and Local Tax	\$30,950	\$3,469,550	\$501,435	\$42,881	\$4,044,816
Full Build-out in 2036					
Dividends				\$7,377	\$7,377
Social Ins Tax- Employee Contribution	\$19,835				\$19,835
Social Ins Tax- Employer Contribution	\$35,161				\$35,161
Tax on Production and Imports: Sales Tax		\$2,185,529			\$2,185,529
Tax on Production and Imports: Property Tax		\$1,438,116			\$1,438,116
Tax on Production and Imports: Motor Vehicle Lic		\$50,375			\$50,375
Tax on Production and Imports: Severance Tax		\$6,773			\$6,773
Tax on Production and Imports: Other Taxes		\$358,791			\$358,791
Tax on Production and Imports: S/L NonTaxes		\$205,182			\$205,182
Corporate Profits Tax				\$45,180	\$45,180
Personal Tax: Income Tax			\$538,999		\$538,999
Personal Tax: NonTaxes (Fines- Fees			\$199,775		\$199,775
Personal Tax: Motor Vehicle License			\$72,310		\$72,310
Personal Tax: Property Taxes			\$20,713		\$20,713
Personal Tax: Other Tax (Fish/Hunt)			\$31,746		\$31,746
Total State and Local Tax	\$54,996	\$4,244,765	\$863,543	\$52,557	\$5,215,861

Note: all dollar figures are reported in 2013 dollars

Source: BST Associates using IMPLAN model