

# Chapter 11 Socioeconomics

This chapter describes socioeconomic conditions and resources in the project area, and how the project alternatives could affect these conditions and resources. Related information can be found in Chapter 1, Purpose and Need; Chapter 5, Land; Chapter 6, Recreation; Chapter 7, Visual Resources; Chapter 8, EMF; and Appendix H, Environmental Justice Tables.

Words in **bold** and acronyms are defined in Chapter 32, Glossary and Acronyms.

## 11.1 Affected Environment

Socioeconomic conditions and resources include population and housing, employment and income, public services, utilities and infrastructure, government revenue, property values, and land-generated income such as agricultural production and private timber production. In addition, existing quality of life and other values important to individuals who live or visit the project area are considered.

### 11.1.1 Population and Housing

About 1.28 million people live in Cowlitz, Clark, and Multnomah counties, in communities ranging from concentrated urbanized areas to sparsely populated rural areas. The population of the cities and towns in the project area range from about 1,600 in Yacolt to about 164,000 in Vancouver (see Table 11-1).

**Table 11-1 Populations of Counties, Cities, and Towns, 2013**

<b>Geographic Area</b>	<b>Population</b>
<b>Cowlitz County</b>	<b>102,110</b>
Castle Rock	2,263
Kelso	11,878
Longview	36,656
<b>Clark County</b>	<b>432,549</b>
Amboy	1,224
Battle Ground	17,797
Brush Prairie	2,780
Camas	19,998
Hockinson	4,805
Vancouver	164,111
Yacolt	1,581
<b>Multnomah County</b>	<b>747,641</b>
Fairview	9,003
Troutdale	16,188
<b>Total</b>	<b>1,282,300</b>
Source: U.S. Census Bureau 2013a	

In 2013, in Cowlitz County about 58 percent lived in the incorporated cities of Castle Rock, Kelso, Longview, Kalama, and Woodland (Washington State Office of Financial Management [OFM] 2013). The population of these cities ranged from about 2,363 (Castle Rock) to about 36,656 (Longview) (see Table 11-1). For Cowlitz County, about 43 percent of the people lived in rural, unincorporated communities such as Yale, Lexington, Ariel, or Cougar, or in rural county areas (OFM 2013; Cowlitz County 2010a).

In 2013, half of the people in Clark County lived in the incorporated cities of Battle Ground, Camas, La Center, Ridgefield, Vancouver, Washougal, Woodland, and Yaoclt (OFM 2013). The largest city in Clark County is Vancouver, with about 164,000 people (see Table 11-1). In 2013, about half of the people in Clark County lived in rural, unincorporated areas, such as Amboy, Brush Prairie, Chelatchie Prairie, Fargher Lake, Hockinson, and Meadow Glade (OFM 2013a).

The current populations of Clark (over 400,000) and Cowlitz (over 100,000) counties are expected to increase by over 25 percent between 2010 and 2030 (OFM 2012). This would be a population increase of more than 110,000 for Clark County and 25,000 for Cowlitz County. The current population of Multnomah County (over 700,000) is expected to increase by about 18 percent between 2015 and 2035 (Oregon Office of Economic Analysis 2013).

Temporary housing in Cowlitz, Clark, and Multnomah counties includes rental housing, hotel/motel accommodations, and campgrounds and RV parks. The 2013 vacancy rate in the Portland-Vancouver-Beaverton Metropolitan Statistical Area for rental housing was about 4.3 percent (U.S. Census Bureau 2013b). At this rate, there likely were about 14,500 housing units available for rent in 2013 (U.S. Census Bureau 2013b). Temporary accommodations are plentiful in the Portland-Vancouver metropolitan area and in Kelso and Longview, Washington, but are more limited in the communities in the eastern portions of the project area. More than 1,000 hotel and motel rooms are available in Cowlitz County. Clark County offers more than 2,500 hotel and motel rooms, and Multnomah County more than 15,000. Availability fluctuates throughout the year, with more demand for temporary lodging in the outlying areas during the summer. Permanent housing availability per county is not discussed due to the short-term nature of construction employment, although many thousands of homes are available in all three counties.

### **11.1.2 Employment and Income**

In 2013, more than 3.3 million people age 16 and over were employed in the Seattle-Tacoma-Olympia and Portland-Vancouver-Beaverton metropolitan areas, which include Clark, Cowlitz, and Multnomah counties and the larger economic regions they are related to (U.S. Bureau of Economic Analysis 2014a). Employment in this regional labor market is well-distributed across a variety of industries. The largest shares of employment in individual sectors are in government and wholesale and retail trade, at 14 percent each. Health care services and manufacturing each employ 9 percent of the region's labor. Professional services, construction, and accommodation and food sectors each employ 7 percent. Real estate, finance and insurance; arts, entertainment, and recreation; and farm sectors each represent 5 percent or less of overall employment (U.S. Bureau of Economic Analysis 2014b). The annual unemployment rate in the metropolitan areas analyzed ranged from 4.9 to 8.6 percent in 2014 (U.S. Bureau of Labor Statistics 2014). In 2011, economists expected the unemployment rate in the region to fall gradually in future years (Williams 2011), which it has since the Draft EIS was released. The Congressional Budget Office projects the unemployment rate could fall to nearly 5.5 percent by 2020 (Hall 2015).

The average total compensation per worker is about \$76,000 for local-government workers in Cowlitz County, \$85,000 in Clark County, and \$94,000 in Multnomah County. These amounts include both the average wage and the costs of benefits (U.S. Department of Labor, Bureau of Labor Statistics, 2015a, 2015b).

In 2013, the average per-capita income across the metropolitan areas ranged from about \$36,000 to \$55,000, and the total personal income across all areas was about \$315 billion. Average per capita income in 2013 was about \$40,500 in Clark County and about \$36,000 in Cowlitz County (U.S. Bureau of Economic Analysis 2014a).

### **11.1.3 Public Services and Infrastructure**

Fire protection in the cities and towns is provided by municipal fire departments in Vancouver, Camas, and Longview, Washington, and Gresham, Oregon (also serves Troutdale and Fairview); the remaining towns rely on rural fire districts. All districts have mutual aid agreements with surrounding departments and districts, and, in the event of a large or unusual emergency, a district would likely call in additional personnel and equipment from neighboring districts. WDNR provides fire protection for more than 12 million acres of state lands. WDNR has mutual aid agreements with most county fire districts, local departments, and other state agencies.

Municipal police departments are located in Castle Rock, Kelso, Longview, Battle Ground, Camas, and Vancouver, Washington, and Fairview and Troutdale, Oregon, and each county has a sheriff's office. The Washington State Patrol has law-enforcement authority throughout the state of Washington, and the Oregon State Police has authority throughout Oregon. In Oregon, the Multnomah County Sheriff's Office would coordinate with the U.S. Coast Guard and the Portland Harbor Master as appropriate for incidents involving the Columbia River. If a large disaster or other event exceeding the resources of any affected department occurred, neighboring departments would share and coordinate resources. Many departments have experienced budget cuts in recent years, and have lost staff or have limited capacity to investigate and respond to incidents in some areas, especially those far from administrative centers or requiring specialized equipment or vehicles.

Water and wastewater services are provided by city and county utilities and local water and sewer utility districts. Water in rural areas or outside of various utility districts is provided by private wells and well systems, sometimes serving multiple users. Wastewater control in areas without sewer districts is provided by septic tanks, drain fields, and holding tanks.

Please see Chapter 5, Land, for a discussion of schools in the project area.

### **11.1.4 Government Revenue**

State, county, and local governments rely on a variety of taxes and revenue sources to fund public services and programs.

### **11.1.4.1 Tax Revenue**

Different forms of tax revenue include the following:

#### **Sales and Use Tax**

Washington's principal source of tax revenue is the retail sales and use tax, which yielded almost \$8 billion in fiscal year 2014. The sales tax is paid for goods and services purchased within Washington. The use tax is paid when goods and services are purchased outside of Washington, but used within the state. Sales tax rates vary throughout the project area since counties and cities can add to the base state tax rate of 6.5 percent (1.2 to 1.9 percent additional tax depending on location in Clark or Cowlitz counties). The yield of the retail sales tax to city and county governments in Clark and Cowlitz counties was about \$130 million in 2014 (Washington Department of Revenue 2014a). Oregon does not assess a sales tax.

#### **Business and Occupation Taxes and Income Taxes**

Washington has state and local business and occupation (B&O) taxes in lieu of an income tax. The cities of Longview and Kelso also assess B&O taxes at a rate of 0.1 percent of gross operating revenue for most businesses. In Oregon, businesses and corporations pay income taxes at the state, and in some cases, the local level. The state assesses personal income taxes based on a rate that varies depending on filing status and level of income, but ranges from 5 to 11 percent of taxable income (Oregon Department of Revenue 2009). Corporations doing business in Oregon pay an excise tax on net income. Corporations not doing business in Oregon, but with income from an Oregon source, also pay income tax. Multnomah County assesses a tax rate of 1.45 percent on the net income of firms doing business in the county (City of Portland 2011). Employers within the Tri-Met District Boundary (which includes most of Multnomah County) pay a 0.7237 percent payroll tax on the wages of their workers (Tri-Met 2014). BPA, as a federal agency, is exempt from paying Washington's B&O tax and Oregon's income tax.

#### **Lodging Tax**

Washington and Oregon charge lodging taxes, such as the 2-3 percent charges in Cowlitz and Clark counties, and up to 13.5 percent in Multnomah County.

#### **Timber Harvest Tax**

In Washington, timberland owners pay a 5 percent excise tax on the stumpage value (the price paid for standing trees intended for harvest) when timber is harvested. The revenue is split, with 4 percent going to the county where harvest occurs and 1 percent to the state general fund. Distributions of the timber excise tax in 2014 produced about \$3.5 million for Cowlitz County and about \$1 million for Clark County (Washington Department of Revenue 2014b).

#### **Property Tax**

Real and personal property are subject to property tax in Oregon and Washington. Real property includes land and any improvements, such as buildings attached to the land. It also includes transmission line rights-of-way, if established by an easement, because the property owner retains ownership of the land, and pays property tax on it. Personal property is not affixed to the land. In Washington, local governments administer the property tax. Property tax

collections in calendar year 2013 in Cowlitz County were about \$104 million and in Clark County about \$505 million (Washington Department of Revenue 2014c). Property tax collections in fiscal year 2013-2014 in Multnomah County were about \$1 billion (Multnomah County Department of Assessment and Taxation 2014).

## Other Taxes

Other taxes include fuel taxes, license taxes, and real estate excise taxes.

### 11.1.4.2 Revenue from Washington State Trust Lands

Land within the project area held in trust by the State of Washington (WDNR) provides revenue for separate trusts managed for various public services, such as public schools, the capitol campus, and other state institutions. The revenue generated for each of those trusts from timber harvested statewide ranged from \$6 million to \$71 million in fiscal year 2014 (see Table 11-2). With the exception of the State Forest Land Trust, revenue generated from trees harvested in a particular county would not necessarily benefit the services in that county. A portion of the revenue from timber harvests on land in the State Forest Land Trust (the last row in Table 11-2) is distributed back to counties where timber harvests occur.

**Table 11-2 Washington State Trust Land Beneficiaries, Acres, and Timber Sales Statewide, 2014**

Trust <sup>1</sup>	Beneficiaries	Acres Harvested <sup>2</sup>	Volume Harvested (MBF) <sup>2</sup>	Value of Sales <sup>3</sup> (\$ millions)
Capitol Building Trust	State Capitol Campus	840	28,949	9
Charitable, Educational, Penal, and Reformatory Institutions Trust	WA State Institutions	641	19,228	6
Common School Trust	Public Schools (K-12)	7,869	153,056	45
Agricultural School Trust and Scientific School Trust	WA State University	1,350	38,493	11
State Forest Lands (Clark, Cowlitz)	County, State General Fund, WDNR	1,029	34,596	71
<b>Total</b>		<b>11,729</b>	<b>274,322</b>	<b>142</b>

Notes:

MBF = thousand board feet

1. Includes only trusts with land in the project area.

2. Statewide amounts, except State Forest Lands, which includes only State Forest Transfer and State Forest Purchase Lands in Clark and Cowlitz counties.

3. Statewide amounts.

Sources: WDNR 2014a, 2014b

The county-level distributions vary from year to year, depending on harvest levels, prices, and other factors. Stumpage values for softwood timber in the Pacific Northwest in 2014 averaged about \$350 per thousand board feet (WDNR 2014b). Over the last 50 years, inflation-adjusted timber prices have fluctuated from a low of around \$100 to a high of over \$500, with a long-term average of about \$222 in inflation-adjusted dollars (Haynes, et al. 2007, 2008). In recent years, distributions from the State Forest Land Trust to counties have averaged around 70 percent of total county-level timber-harvest revenues (Saunders 2010, 2012). Of the State

Forest Lands Trust's fiscal year 2014 revenues, about \$9 million went to Clark County and about \$900,000 went to Cowlitz County (WDNR 2014b).

### **11.1.5 Property Value**

The value of property can be measured in several ways. The price at which property is bought and sold under competitive conditions determines the market price. County assessors assess the value of real property for tax-collection purposes. Assessors estimate the value of residential properties based on the recent sale price of nearby, similar properties. They estimate the value of most commercial and industrial properties based on the potential use or revenue-generating potential of the property (Washington Department of Revenue 2005). The assessed value of real property in 2013 was about \$8 billion in Cowlitz County, \$39 billion in Clark County, and \$61 billion in Multnomah County (Washington Department of Revenue 2014c; Multnomah County Department of Assessment and Taxation 2014). Due to market adjustments from the 2009 recession, the market value of property has generally trended downward because of foreclosures, financing difficulties, unemployment, sluggish economic conditions, reduced demand, and excess housing supply. Although economies are improving, Cowlitz and Clark counties have shown only 5 percent and 10 percent population growth, respectively, from 2005 to 2013 (U.S. Census Bureau 2015). Homeowners have often found themselves with mortgage balances higher than the value of their home.

In addition to fee-owned property, BPA has existing easements in the project area that were obtained when the existing transmission lines were built. These easements, depending on the original agreement, allow BPA to use but not own the land, and restrict the types of activities and uses allowed in the right-of-way. Typically, a transmission line easement specifies the present and future right of BPA to clear the easement area (both on and off the right-of-way) of all types of incompatible vegetation. In many cases, the landowner has been able to reserve the right to grow and maintain non-woody, low-growing plants, such as annual agricultural crops or vegetative cover that do not require structural support. The transmission line easement also specifies the present and future right to clear the right-of-way of any and all structures, above and below ground improvements or infrastructure, and fire and electrical hazards. BPA has compensated landowners for such easement rights.

Building BPA's existing transmission lines may have changed other uses of some properties depending on a line's location and the shape and size of, and improvements on the property. If the easement effectively severed an area (stranded use) from the remaining property, then payment was made for that damage at the time the easement was secured (severance damage). This and other factors were considered to determine the loss in value within and outside of a specific easement area.

### **11.1.6 Agricultural Production**

Agricultural land makes up about 10 percent of the total land area in Cowlitz, Clark, and Multnomah counties: about 5 percent (39,009 acres) in Cowlitz County, about 18 percent (74,758 acres) in Clark County, and about 10 percent (29,983 acres) in Multnomah County. Of the total land in agriculture about 39 percent is harvested cropland (USDA NASS 2014a, 2014b). The amount of land in agriculture has decreased in these counties over the past two decades by about 17 percent. The 2012 Census of Agriculture identified 3,019 farms which, on average, are about 50 acres each (U.S. Department of Agriculture 2014a, 2014b). Crops grown in the project

area include forage for livestock such as hay, nursery stock, grapes, berries, and Christmas trees. Livestock production within the project area includes poultry and cattle (Washington State Department of Agriculture 2009) (see Chapter 5, Land).

In 2012, crops in Cowlitz, Clark, and Multnomah counties produced about \$148 million in revenues. Although the total value of agricultural production was positive in each of these counties, the number of farms with net losses exceeded the number of farms with net gains in each county. Besides generating revenue from production directly, agricultural lands and farms contribute to the region's economy by providing open space and other valuable amenities that contribute to the quality of life for residents and visitors.

### **11.1.7 Private Timber Production**

Lands used for private timber production make up about 47 percent of the land area in Cowlitz, Clark, and Multnomah counties: 64 percent (477,600 acres) in Cowlitz County (Cowlitz County Planning Division 1976), 38 percent (159,500 acres) in Clark County (Clark County Community Planning Office 2010) and 15 percent (45,400 acres) in Multnomah County (Multnomah County 2007).

Private timberland owners harvested about 263 million board feet of timber from about 4,500 acres in Cowlitz, Clark, and Multnomah counties in 2013, about 75 percent of the total timber harvest in these counties (WDNR 2013; Oregon Department of Forestry 2014). About 81 percent of this timber was harvested in Cowlitz County. Stumpage values for softwood timber in the Pacific Northwest in 2014 averaged about \$350 per thousand board feet (Zhou 2013). Over the last 50 years, inflation-adjusted timber prices have fluctuated from a low of around \$100 to a high of over \$500, with a long-term average of about \$222 in inflation-adjusted dollars (Haynes et al. 2007; Haynes 2008).

### **11.1.8 Community Values**

This section discusses existing values important to the community that were identified by members of the public in scoping and Draft EIS comments. Included in this discussion are community values such as quality of life, property-related amenities, recreation and tourism, the natural environment, transmission system reliability, and public health and safety.

#### **11.1.8.1 Quality of Life**

Many people who live in the project area have identified the rural character of the landscape, deeply-rooted family history, small, close-knit communities, high-quality public services, and distance from industrial development and “the tell-tale signs of civilization” as defining the quality of life they enjoy. These attributes are recognized by economists as being important to a person's quality of life. Economists identify different categories of goods and services that increase personal well-being in different ways, both directly and indirectly as inputs to the production of other valuable goods and services. Common categories include human capital (e.g., knowledge and skills), human-built capital (e.g., roads, buildings, utilities), social capital (e.g., laws, cultural norms, relationships), and natural capital (e.g., rivers, forests, soil, and air) (O'Sullivan and Sheffrin 2001; Case and Fair 2004).

The region's stock of natural capital—its natural environment—produces many types of goods and services that contribute to the quality of life of residents and visitors. These goods and

services, such as scenic views, open space, and opportunities for solitude, quiet, and recreation, directly improve the well-being of people who enjoy them as they live, work, and visit nearby. The region's stock of social capital also influences the quality of life. Social scientists define social capital as the network of connections that individuals build within a community that creates reciprocity with, and trust in, members of that community and institutions that represent their interests (Ritchie and Gill 2004). Events or issues that could generate change in communities can affect their stock of social capital and the quality of life of their residents.

Changes that highlight value differences within communities about economic development, environmental quality, and perceptions of risks and benefits can generate corrosive community reactions that may strain existing interpersonal relationships and erode existing stocks of social capital (Marshall et al. 2004; Freudenburg 1997). Changes that adversely affect social capital may reduce a community's ability and capacity to work efficiently to address a wide range of challenges and disruptions, reducing quality of life in the community.

### **11.1.8.2 Property-Related Amenities**

Individuals enjoy benefits from amenities in the natural environment surrounding their homes, such as scenic views, solitude and quiet, a sense of safety, and a sense of privacy. Visitors also enjoy these benefits. Some of the value of these amenities is included in the market price of property. In some cases, however, the market price may not fully account for the value people derive from property-related amenities. The characteristics of the property-related amenities vary considerably throughout the area, from property to property, and from individual to individual. This variation makes the property-related amenities difficult to describe in detail. A particular amenity, e.g., sense of privacy, may be important to one property owner, but not to their neighbor, or may make an important contribution to the market price of one property but not to others nearby. In general, natural and landscaped amenities are important to property owners in rural, urban and suburban areas, and may contribute to the value people derive from their property.

### **11.1.8.3 Recreation and Tourism**

Economists estimate the value of recreational services by looking at two factors: the amount of money people spend to participate in a recreational activity, and the difference (called consumer surplus) between what they are willing to spend and what they actually spend. The recreational goods people purchase include everything from permits and equipment, such as hunting rifles and fishing rods, to the gas, food, and lodging purchased during a recreational trip. Travel-related spending in the three counties ranged from about \$142 million in Cowlitz County in 2009 (adjusted to 2014 dollars) to about \$3.4 billion in Multnomah County in 2014 (Washington Department of Commerce 2010; Oregon Tourism Commission 2015). Consumer surplus is important because it registers improvements in economic well-being: if someone can pay just a little to enjoy fishing, boating, or some other activity that is of high value to them, then he or she is economically better off.

The average consumer surplus per person per day for common recreational activities in the project area ranges from \$28 for hiking to \$90 for wildlife watching (Loomis 2005, adjusted to 2014 dollars). The economic importance of recreation is increasing in importance overall: more people are recreating more often, and willing to pay greater amounts to do so. In recent years the amount people are willing to pay per person for a day of outdoor recreation has grown faster than inflation, about \$1 per year (Rosenberger and Loomis 2001). Expenditures are

important because they generate jobs and income in the communities where they occur. The opportunity to enjoy large increases in consumer surplus can influence some households to locate near the area's recreational resources, with indirect effects on the area's labor and consumer-spending markets.

#### **11.1.8.4 Natural Environment**

Visual resources, water resources, wetlands, vegetation, wildlife, and fish are present in the project area (see Chapters 7, Visual; 15, Water; 16, Wetlands; 17, Vegetation; 18, Wildlife; and 19, Fish). These resources contribute to personal well-being in several ways, including the following:

- Knowing that they exist
- Having the option to enjoy them directly
- Ensuring that their children enjoy them in the future
- Engaging in recreation, subsistence hunting, sightseeing, or some other direct use

Some of the species found in the area, including the Northern spotted owl and several species of Pacific salmon, have received federal threatened or endangered status. Many people place a considerable value on the continued survival of such species. The value placed by residents on protecting threatened, endangered, and rare species similar to those that might be found in the area ranges from \$50 to \$150 per year per household, depending on the species (Richardson and Loomis 2009, adjusted to 2014 dollars). Research suggests that a household's willingness to pay to protect sensitive plant species generally is lower than the willingness to pay for mammals and birds, but likely higher than their willingness to pay for insects or reptiles (Martin-Lopez, et al. 2007).

#### **11.1.8.5 Transmission System Reliability**

A reliable supply of electricity is an important contributor to the quality of life of the region's residents and the stability of its economy. The Pacific Northwest currently enjoys a reliable supply of electricity at rates lower than those paid in many parts of the country. Considerable uncertainty surrounds the specific value of reliable electricity and the costs of unreliable electricity, especially at a local level (Eto et al. 2001). National estimates suggest that the annual cost of power interruptions in the U.S. is around \$100 billion per year, with most of the cost concentrated in the commercial and industrial sectors. The cost to the Pacific Northwest is estimated at over \$3 billion per year (LaCommare and Eto 2004, adjusted to 2014 dollars).

The cost of power interruptions manifests in different ways across commercial, industrial, municipal, and residential customers, and the public that depends on the goods and services electric power sustains. Commercial, industrial and municipal customers may experience costs when infrastructure, such as machinery, computers, and networks, stops functioning. Commercial and industrial customers may lose revenues and incur unexpected labor and material costs. Some revenues lost during an outage may be partially or wholly offset if, for example, workers work overtime after an outage to meet deadlines, or customers delay rather than cancel purchases. Residential customers may incur direct costs for items such as batteries, eating out, and food spoilage, and intangible costs such as the time required to reset appliances, disruptions in plans, and anxiety about power outages. The public may experience costs when traffic lights, elevators, and other public infrastructure fails, causing delays and increasing the

risk of accidents. The average cost a U.S. residential electricity customer incurs from a power outage ranges from about \$2.40 for momentary disruptions to \$3.20 for sustained interruptions, per outage, in 2014 dollars. The average cost per outage for a commercial customer ranges from almost \$800 to \$1,400, and the average cost to an industrial customer ranges from almost \$2,500 to \$5,500, in 2014 dollars (LaCommare and Eto 2004).

### **11.1.8.6 Public Health and Safety**

Between 2003 and 2007, annual fatality rates among workers who installed and repaired transmission lines in the U.S. fluctuated between 11 and 20 per 100,000 workers. During this period, these workers experienced injuries at a rate of between 4 and 5 per 100 workers per year, and job-related illnesses at a rate between 0.4 and 1 per 100 workers per year. Twenty-four workers had fatal injuries in power/communications construction in 2010 (U.S. Department of Labor, Bureau of Labor Statistics 2012). The most common causes of injury or illness were overexertion, contact with equipment and other objects, and falls (U.S. Department of Labor, Bureau of Labor Statistics 2009).

Transmission lines and electrical substations generate EMF, which many people perceive as risks to their personal health and well-being, or they are concerned about radio and TV interference. The perceived health implications of EMF often generate controversy among people living or working near transmission lines. Most people in the U.S. are continually exposed to EMF, which are present wherever electricity flows. Many studies have investigated the possibility of health risks from exposure to EMF, but few have found conclusive evidence that any exist (von Winterfeldt et al. 2004; Florig 1992) (see Chapter 8, Electric and Magnetic Fields and Appendices F, F1, G, and G1).

### **11.1.9 Environmental Justice**

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations states that each federal agency shall identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low income populations. The Order further stipulates that the agencies conduct their programs and activities in a manner that does not have the effect of denying persons access to public information on, or excluding persons from participation in, matters relating to human health or the environment, or subjecting persons to discrimination because of their race, color, or national origin.

Guidelines provided by the Council on Environmental Quality (CEQ) (1997) and the EPA (1998) indicate that a minority community may be defined where either 1) the minority population comprises more than 50 percent of the total population of a defined group, or 2) the minority population of the affected area is meaningfully greater than the minority population in the general population of an appropriate benchmark region used for comparison (such as a city, county, or state). Minority communities may consist of a group of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals who experience common conditions of environmental effect. Further, a minority population exists if there is “more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds” (CEQ 1997).

The CEQ and EPA guidelines indicate that low income populations should be identified based on the annual statistical poverty thresholds established by the U.S. Census Bureau. Like minority

populations, low income communities may consist of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals who would be similarly affected by the proposed action or program. The U.S. Census Bureau defines a poverty area as a census tract or block numbering area where at least 20 percent of residents are below the poverty level (U.S. Census Bureau 2013e).

Both the CEQ and EPA guidelines note that larger and more populated geographic areas may have the effect of “masking” or “diluting” the presence of concentrations of minority and low income populations (CEQ 1997, EPA 1998). The three potentially affected counties (Cowlitz, Clark, and Multnomah) encompass large areas, ranging in size from 466 to 1,166 square miles. The potential existence of “high concentration pockets” of minority communities in the vicinity of the action alternatives was evaluated by reviewing 2010 Census data at the block group level. A block group is a smaller geographic subdivision of a census tract and typically contain between 3,000 and 6,000 people. Poverty-level information was evaluated by reviewing data at the census tract level (poverty data at the block group level was not available) from the most recent data available: 5-year estimates of poverty levels (for the past 12 months) for the 2013 American Community Survey (U.S. Census Bureau 2013d).

BPA completed the analysis of minority of low-income population groups with the following approach and assumptions:

- Using CEQ criteria, BPA defines a census block group as minority if that block group is more than 50 percent minority, or if the block group is less than 50 percent minority overall, but over 50 percent higher than the county as a whole. For example, if the county minority population is 20 percent, a block group would be considered minority if it is greater than 30 percent (50 percent higher than the county as a whole). Total minority population is combined in the evaluation.
- For an analysis of poverty levels, BPA considers a census **tract** low income if that census tract reports 20 percent or more of the population below the poverty level. BPA also considers a census tract low income if the poverty level, regardless of its rate, was 50 percent higher than the county poverty level.

### 11.1.9.1 Minority Populations

As reported in 2010, Cowlitz County had a minority population of about 14 percent, with 8 percent identifying as Hispanic or Latino, 1.6 percent identifying as Asian or Pacific Islander, 1.3 percent identifying as Native American or Alaskan Native, less than 1 percent identifying as Black or African American, and almost 86 percent identifying as White alone. The remaining percentage identified as some other race alone or of two or more races (see Table 11-3).

Clark County reported a minority population of about 18 percent, with about 8 percent identifying as Hispanic or Latino, 4.7 percent identifying as Asian or Pacific Islander, 2 percent identifying as Black or African American, less than 1 percent identifying as Native American or Alaskan Native, and almost 82 percent identifying as White alone. The remaining percent identified as some other race alone or of two or more races (see Table 11-3).

Overall, the state of Washington was more diverse than counties in the project area, reporting a minority population of about 27.5 percent, with 11 percent identifying as Hispanic or Latino, 8 percent identifying as Asian or Pacific Islander, 3 percent identifying as Black or African American, and 1 percent identifying as Native American or Alaskan Native (see Table 11-3), and

72.5 percent identifying as White alone. The remaining percent identified as some other race alone or of two or more races (see Table 11-3).

Multnomah County had a minority population of about 28 percent, with an Hispanic or Latino population of about 11 percent, 7 percent identifying as Asian or Pacific Islander, 5.4 percent identifying as Black or African American, less than 1 percent identifying as Native American or Alaskan Native, 72.1 percent identifying as White alone, and almost 4 percent identifying as some other race alone or as two or more races. Comparatively, the state of Oregon was less diverse than Multnomah County, reporting a minority population of about 21.5 percent, with 12 percent identifying as Hispanic or Latino, 4 percent identifying as Asian or Pacific Islander, 2 percent identifying as Black or African American, 1 percent identifying as Native American or Alaskan Native, 78.5 percent identifying as White alone, and 3 percent identifying as some other race alone or as two or more races (see Table 11-3).

**Table 11-3 Race and Ethnicity by Aggregated Block Groups,<sup>1</sup> County, and State**

Geographic Area <sup>2</sup>	Total Population	Percent of Total Population							
		Minority Population	White	American Indian or Alaskan Native	Asian or Pacific Islander	Black or African American	Hispanic or Latino	Some Other Race Alone	Two or More Races
<b>Washington State</b>	<b>6,724,540</b>	<b>27.5</b>	<b>72.5</b>	<b>1.3</b>	<b>7.7</b>	<b>3.4</b>	<b>11.2</b>	<b>0.2</b>	<b>3.7</b>
Cowlitz County	102,410	14.2	85.8	1.3	1.6	0.6	7.8	0.1	2.9
Aggregated Block Groups Crossed by the Project	30,237	9.5	90.5	1.2	1.0	0.3	4.4	0.1	2.5
Clark County	425,363	18.2	81.8	0.7	4.7	1.9	7.6	0.2	3.3
Aggregated Block Groups Crossed by the Project	84,994	13.7	86.3	0.7	3.4	1.3	5.5	0.2	2.7
<b>Oregon State</b>	<b>3,831,074</b>	<b>21.5</b>	<b>78.5</b>	<b>1.1</b>	<b>4.0</b>	<b>1.7</b>	<b>11.8</b>	<b>0.1</b>	<b>2.9</b>
Multnomah County	735,334	27.9	72.1	0.8	7.0	5.4	10.9	0.2	3.6
Aggregated Block Groups Crossed by the Project	3,821	28.6	71.4	0.6	12.7	4.3	7.7	0.1	3.2

Notes:

1. Data compiled as part of the 2010 Census are the most recent available data at the census block group level.
2. There are 80 block groups (representing 43 census tracts) crossed by the I-5 Project. Block groups were aggregated at the county level. See Appendix H for specific block-level data.

Sources: BPA 2015, U.S. Census Bureau 2010

Block groups crossed by the transmission line right-of-way, access roads, and substations were aggregated within their representative counties (see Table 11-3; individual block group data is in Appendix H). The Cowlitz County aggregate had a minority population of 9.5 percent, and the Clark County aggregate had a minority population of about 14 percent. One block group out of 25 in Cowlitz County (Block Group 2 in Census Tract 13, just north of Kelso, Washington)

reported a minority population greater than 50 percent above the county minority population. Two block groups out of 53 in Clark County (Block Groups 3 and 4 in Census Tract 407.03, northeast of the I-205-WA SR 500 interchange) reported a minority population greater than 50 percent above the county minority population. Overall, the percentages of minority populations in the aggregated block groups crossed by the project in Washington were less than the corresponding county minority populations (and less than the minority population of Washington).

The block groups crossed by the project in Multnomah County had an aggregated minority population of 28.6 percent. The minority population percentages for aggregated block groups crossed by the project in Multnomah County were therefore greater than the minority population percentage of Multnomah County (and the minority rate of Oregon), but were not 50 percent greater than the county minority population.

Of the 80 block groups analyzed (representing 43 census tracts) using CEQ criteria, three minority populations in Cowlitz and Clark counties were identified. These are crossed by the West Alternative and/or Crossover Alternative.

### **11.1.9.2 Low-Income Populations**

BPA considers a low-income census tract equivalent to a poverty area, as defined by the U.S. Census Bureau (a census tract where at least 20 percent of residents are below the poverty level). BPA includes in the definition of poverty areas census tracts where the poverty level, regardless of its rate, was 50 percent higher than the respective county poverty level as reported by the American Community Survey for 2009-2013, an annual calculation of state-specific poverty information by the U.S. Census.

Median household income in Cowlitz County was \$47,596, with a poverty rate of 17.6 percent (see Table 11-4). Median household income in Clark County was \$58,225, with a poverty rate of 12.4 percent. Comparatively, Washington had a median household income of \$59,478 in 2009-2013, higher than Cowlitz and Clark counties, and 13.4 percent of its population below the poverty level.

Data for census tracts crossed by the project were aggregated within their representative counties (population data were added across census tracts, household income data were averaged across census tracts). The aggregated Cowlitz County census tracts crossed by the project reported a median household income of \$56,151, which was higher than the overall Cowlitz County median household income. About 11 percent of the population of Cowlitz County census tracts crossed by the project was below the poverty level, which was lower than the overall poverty rate in the county. Census Tract 13 (just north of Kelso, Washington) reported almost 28 percent of the population below the poverty level, a value greater than 50 percent above the Cowlitz County poverty rate.

**Table 11-4 Income and Poverty Status by Census Tract,<sup>1</sup> County, and State**

<b>Geographic Area<sup>2</sup></b>	<b>Total Population for whom Poverty Level is Assessed</b>	<b>5-Year Estimate of Median Household Income (\$) for the Past 12 Months</b>	<b>5-Year Estimated Population below the Poverty Level for the Past 12 Months</b>	<b>Percent of Population below the Poverty Level (%)</b>
<b>Washington State</b>	<b>6,686,172</b>	<b>59,478</b>	<b>893,211</b>	<b>13.4</b>
Cowlitz County	100,782	47,596	17,750	17.6
Aggregated Census Tracts Crossed by the Project	46,620	56,151	5,238	11.2
Clark County	428,222	58,225	53,164	12.4
Aggregated Census Tracts Crossed by the Project	135,135	66,049	14,441	10.7
<b>Oregon State</b>	<b>3,793,058</b>	<b>50,229</b>	<b>614,778</b>	<b>16.2</b>
Multnomah County	732,970	52,511	130,507	17.8
Census Tract 102 (Crossed by the Project)	5,638	57,683	794	14.1
Notes:				
1. These data compiled as part of the 2013 American Community Survey are the most recent available data at the census tract level.				
2. There are 43 census tracts crossed by the I-5 Project. Census tracts were aggregated at the county level. See Appendix H for specific census tract-level data.				
Sources: BPA 2015; U.S. Census Bureau 2013a, 2013b, 2013c, 2013d				

In Clark County, the median household income of census tracts crossed by the project was \$66,049, with an average poverty rate in those tracts of almost 11 percent. The aggregated census tracts reported a higher median income and a lower poverty rate than Clark County overall. However, four census tracts out of 32 crossed by the project in Clark County (Census Tracts 407.06, 411.04, and 413.12, northeast of the Interstate 205-WA State Route 500 interchange, and 415 in downtown Camas, Washington) reported low-income populations (see Appendix H for individual census tract data).

Multnomah County had a median household income of \$52,511 in 2013, with 17.8 percent of its population below the poverty level. There is only one census tract within Multnomah County in the project area. This census tract reported a median household income higher than the county median at \$57,683, and a lower poverty level of about 14 percent. Comparatively, Oregon had a median household income of \$50,229, with about 16 percent of its population below the poverty level.

Overall, although five out of the 43 census tracts crossed by the project reported low-income populations in 2013, the median incomes of the block groups crossed by the project were higher than the respective county incomes, and poverty rates in those census tracts were lower than the county (and state) poverty rates. Of the five census tracts, four are near the West Alternative or Crossover Alternative, or both, and one in Kelso, Washington, would be crossed by all action alternatives.

## 11.2 Environmental Consequences

General impacts that would occur for the action alternatives are discussed below, followed by impacts unique to each alternative.

### 11.2.1 Impact Levels

Impacts would be **high** where project activities would cause the following:

- A reduction in the supply of housing or the capacity of public services, utilities, or infrastructure required to satisfy demand
- A reduced level of government revenues by an amount sufficient to reduce the capacity of public services or infrastructure
- A change to the market price of agricultural products or timber at the regional or national level
- A permanent, disproportionate impact to a low income or minority population
- A full percentage point of change to the rate of unemployment

Impacts would be **moderate** where project activities would cause the following:

- A substantially increased level of use of existing stocks of housing, utilities, and public services and infrastructure
- A measurably reduced level of government revenues, but by an amount that does not degrade the capacity of public services and infrastructure
- A change to the market price of agricultural products or timber at the local level
- A disproportionate impact during construction to a low income or minority population
- A half percentage-point change to the rate of unemployment

Impacts would be **low** where project activities would cause the following:

- Little effect on the supply of or level of use of housing or utilities, public services and infrastructure, government revenues, or the market prices of agricultural products or timber
- A 1/10 of 1 percent change in the unemployment rate

**No** impact would occur where project activities would have no effect on the supply of or level of use of housing or public services and infrastructure, government revenues, or the market prices of agricultural products or timber; no disproportionate effect to a low income or minority population; and an imperceptible change to the unemployment rate.

## 11.2.2 Impacts Common to Action Alternatives

### 11.2.2.1 Population and Housing

At the peak of construction, the project would employ about 200 construction workers; about 150 of these workers would be from outside the local area. These non-local workers would temporarily increase local populations by about 180 persons (assuming some non-local workers would be accompanied by their families). Many of the construction workers would provide their own housing, such as campers or trailers, but require a place to park them; others would require motel rooms, rentals and other temporary housing. There would be a short-term increase in the demand for temporary housing in the project area, but existing temporary housing near the project (see Section 11.1.1, Population and Housing) would be sufficient to accommodate non-local workers and their families without creating a discernable change in availability, a **no-to-low** impact on housing during construction. Existing BPA staff would operate and maintain the new transmission line and associated facilities, so there would be **no** long-term impact on the population and the demand for housing.

### 11.2.2.2 Employment and Income

Construction activities would create a short-term increase in employment; at the peak of construction, the project would directly provide about 200 jobs. Indirect impacts would also occur as construction-related workers and suppliers spend their earnings on goods and services in the area, generating additional demand for labor, but these effects likely would be too small to be discernible relative to the size of the regional economy. If construction occurs during a period with low unemployment (not the current condition), workers would likely come from other projects and the net impact on local employment would be near zero. If construction occurs during a period of high unemployment, local, skilled workers could be hired, and the net impact on regional employment would be about 200 jobs (about 0.006 percent of the labor force in the region). Based on the current rate of unemployment in the economic area (about 200,000 unemployed), the jobs provided by the project would not cause a perceptible change in this rate. This change would be imperceptible even if all jobs were new jobs; in the case of this project, some of the workers will already be employed, so the project would have no impact on unemployment.

Construction activities would cause a short-term increase in income through construction-related spending on labor, materials, and land. The project would involve increased expenditures of about \$16 million for existing BPA contractors and staff, and \$240 million on wages and benefits for non-BPA contract workers, of which about \$60 million would go to workers from within the area and \$180 million would go to workers from elsewhere. Additional direct income would be generated for business owners, landowners, and workers from expenditures of about \$175 million for construction materials and an additional undetermined amount for land and easement acquisitions. The overall direct impact on income for the entire construction period would be equivalent to about 0.13 percent of total personal income in the area in 2013. This is barely measureable and a **low** impact. Indirect increases in income would occur as those receiving income spend it locally on goods and services. The indirect impact likely would be smaller than the direct impact on income.

During operation and maintenance, the project would have **no** long-term direct impact on employment and **no** impact on private income, as BPA plans to operate and maintain the new

transmission line with existing staff. The project could have long-term, indirect effects on employment, such as effects on the flow of goods and services, such as timber from the lands occupied or affected by the right-of-way, substations, and access roads. These would occur as the project converts existing timberlands and the net flow of timber to local mills decreases. The direct jobs multiplier for lumber and wood products in Washington in 2012 was nine jobs per million board feet of harvest (Zhou 2013). Because timberland owners may respond to decreases in harvest from the right-of-way by harvesting elsewhere, the project's net impact on jobs in the regional wood-products sector is unknown. However, any changes would likely be too small to be discernable relative to the size of the regional economy and regional timber markets. By improving the reliability of electricity delivery in the region, the project would encourage businesses that need high-quality power to locate and invest in the area, which could provide jobs. Improved reliability would allow commercial, industrial, and residential consumers to avoid costs from power interruptions.

### 11.2.2.3 Public Services and Infrastructure

Given the nature of the project, overall long-term impacts on most, if not all, public service and infrastructure providers from the project likely would be too small to be discernible. Because the project would not permanently increase employment or population in the area, no overall impact to schools, police, fire, or medical services would occur. However, during project construction activities, there could be temporary and periodic higher demand for some public services.

Serious construction-related accidents would increase the demand for emergency medical, police, and fire services. This could cause short-term, localized decreases in the ability of these service providers to meet existing demands if such demands exceeded current capacity. Similarly, during operation and maintenance activities, any project-related accidents that occur could temporarily increase demand for emergency medical, police, and fire services in remote locations, again resulting in short-term, localized decreases in the ability of service providers to meet existing demand if such demands exceeded current capacity. However, most of the time there would be no impacts.

During construction, water would be used as the main method of dust control on access roads, and at tower and substation sites. Water is mixed with backfill to bring the soil to the right moisture content for compaction. Water is also used for fire prevention in areas where dry grasses create a fire hazard. Water would be taken from a permitted local source, either from landowners or municipalities, to minimize haul distance and costs. Because a permit is required, a local municipality can evaluate in advance whether they can meet this added demand and would not likely approve the permit if the supply was not available.

The Castle Rock substation sites would not have water or sewage utilities so no wastewater would be generated. The Sundial substation site would require water and sewage supply and treatment and these facilities would be designed and coordinated with the local municipality, Troutdale.

Impacts on public services and infrastructure that do materialize likely would be **low**, as they would not diminish the supply of services and infrastructure for other purposes.

### 11.2.2.4 Government Revenue

Short-term increases in government revenue would result from taxes on direct and indirect project-related spending during construction, and from the harvest of the existing stock of privately owned timber in and near the existing and new right-of-way, substations, and access roads. Additional short-term increases in revenue to state trusts would occur if the project results in the harvest of timber from trust lands that otherwise would not be harvested until later. Some of the timber-related increase would be offset if state and private timberland managers decided to reduce harvest on other lands.

The project could cause long-term decreases in government revenue by diminishing the base value of property subject to property taxation, reducing future timber-related revenue from state trust lands, and decreasing future revenue from taxes on private timber harvests and some agricultural products.

Overall, the project-related spending during construction and maintenance would have **no** adverse impact on tax revenue for Cowlitz, Clark, and Multnomah counties. The long-term decrease in timber-harvest tax revenue during operation may, in some years, exceed either Cowlitz or Clark county average annual compensation cost per one employee and have a **high** impact on the two counties.

#### Tax Revenue from Project-Related Spending

As a federal government agency, BPA is exempt from taxes on project-related expenditures. Its contractors are not exempt, and would pay applicable taxes on project-related purchases. These direct expenditures and subsequent spending of project-related earnings by workers and contractors would create short-term, indirect increases in revenue for Oregon, Washington, and the counties and local jurisdictions in the project area, from several sources: sales and use taxes (in Washington), income taxes (in Oregon), lodging tax, timber harvest tax, property tax, fuel tax, and real estate excise tax. It is expected that the contractor would pay property owners a rental fee to use their land for staging areas and helicopter fly yards for the entire construction period.

#### Sales and Use Tax

Washington would assess sales or use taxes on materials purchased for the project. Whether it assesses sales or use tax would depend on where the materials are purchased (in Washington or another state), who purchases them (BPA on behalf of a project contractor, or directly by project contractors), and where the materials are installed (in Washington or Oregon). Assuming sales or use taxes are paid on the full cost of the project's materials, which BPA currently estimates at about \$100 million, Washington would collect sales and use taxes on project materials of about \$8 million. This amounts to about 0.1 percent of the total sales and use tax collections in Washington in 2014.

Workers who spend personal income earned from the project on goods and services they purchase in Washington would also pay sales taxes. BPA expects to spend about \$88 million on wages and benefits for contract workers. Assuming that most of the workers on the project from within the region come from Washington and spend all of their income in Washington, and workers from outside the region spend half of their income in Washington, sales tax collections directly stemming from workers' spending would be about \$4.3 million over the life of the

project. This amounts to about 0.05 percent of the total sales and use tax collections in Washington in 2014.

The project would preclude the production of some agricultural crops, such as nursery stock and Christmas trees, which are subject to sales and use tax if sold retail in Washington. If all these crops are sold in Washington and none are exported, the value of retail sales tax that would have been collected except for this project (using the West Alternative, where the largest impact would occur), would be about \$2 million, or about 0.025 percent of total sales and use tax collections in Washington in 2014. If 10 percent of Christmas trees were sold in Washington (Pacific Northwest Christmas Tree Association 2012), actual lost sales tax revenue for trees would be about \$29,000. Adding this amount to lost tax revenue from nursery stock (assuming all stock is sold locally which is unlikely) would be about \$1.3 million. Of this amount, for the West Alternative, about \$300,000 would be lost tax revenue to local governments (around \$6,000 for the Central and Crossover alternatives, and about \$2,000 for the East Alternative) and the rest to the state. Other crops affected by the project, regardless of the action alternative, such as blueberries, are food crops (including hay used as animal feed) meant for human consumption, and are not subject to the sales and use tax.

### **Income Tax**

Workers living in Oregon and non-residents working in Oregon who meet minimum Oregon-earned income thresholds would pay Oregon income taxes. The amount of income tax collected from this project would depend on the number of workers from Oregon and the amount of project-related labor income earned in Oregon. Assuming all workers from the region were from Oregon and 25 percent of the non-resident workers' income was earned and taxable in Oregon, the project would cause \$3.2 million in income tax for Oregon over the life of the project. This amounts to about 0.02 percent of the total personal income-tax collected in 2013. To the extent that corporations working on the project pay income taxes in Oregon and business and occupation (B&O) taxes in Washington, the amount of tax collections would be somewhat higher, although the amount of corporate income or gross receipts that would be attributable to the project is difficult to determine, given available information. Businesses in Washington involved in retailing, wholesaling, or manufacturing agricultural products may pay less B&O tax each year if the reduction in crop production reduces their gross receipts. Similarly, businesses involved in retailing, wholesaling, or manufacturing timber products may pay more or less B&O tax if the project increases or decreases their gross receipts.

### **Lodging Tax**

Workers who stay in temporary lodging in Oregon or Washington would pay lodging taxes. Assuming all non-resident workers seek temporary housing in hotels in Cowlitz and Clark counties during the work week (5 days) for the duration of the project (18 months), and the average rate paid is \$50 per night, about \$67,500 in lodging tax would be collected over the life of the project. This amounts to about 4 percent of the total lodging tax collected in Clark and Cowlitz counties in 2014.

### **Timber Harvest Tax**

The project may cause a short-term, direct increase in the timber-harvest tax revenue of affected counties and the state government in Washington by triggering harvest of the existing mature timber stock on private lands in and near the new right-of-way, and for the substations

and access roads. Depending on economic feasibility, either the grower/landowner would harvest the timber themselves, or, BPA would harvest the timber after an appraisal is completed and an easement is negotiated and secured. Harvest of existing mature timber stock on existing BPA right-of-way would likely not contribute to an increase in tax revenue as this timber may be owned outright by BPA through fee-owned title or owned by BPA as reflected in existing easement language. As a federal agency, BPA does not pay taxes and there would be no timber-harvest tax revenue generated in these cases.

Any increases in revenue would be offset if, because of the unplanned harvest on the cleared lands, landowners decide not to harvest trees on other lands. The project would create a long-term decrease in timber-harvest tax revenue by precluding future timber production on these lands, except for timber harvested as danger trees or for pulling and tensioning sites, where trees would be allowed to grow back. The short-term, direct increase and the long-term direct decrease in tax revenue for each action alternative are presented in Sections 11.2.3 through 11.2.7.

## **Property Tax**

BPA would acquire land rights (easements) from private property owners for constructing, operating, and maintaining the transmission line and access roads. The property owner would retain ownership of the property and continue to pay property tax on the entire parcel, including the land within BPA's easement. BPA would purchase property for its substations (and possibly substation access roads) in Cowlitz and Multnomah counties. Federal and state agencies are exempt from paying local property taxes, so the counties would not collect property taxes on the property acquired in fee for the substation and substation access roads.

Direct decreases in property taxes would occur for properties BPA acquires and removes from the tax rolls. The value of property tax collections to Cowlitz County for the Baxter Creek substation site was \$1,109 in 2014. The value of collections to Cowlitz County for the Monahan Creek substation site (both parcels combined) was \$1,529 in 2014. Additional decreases in property taxes may occur if county assessors lower the assessed value of a property in response to BPA securing an easement that constrains use of the property (severance, loss of use, etc.). Indirect decreases in property taxes could occur for nearby residential properties if assessors reduce the assessed value of a property in response to a project-related reduction in the quality of amenities or income-generating potential of the site (for commercial properties). BPA has not been presented with any evidence on previous projects that this has occurred. Increases in property tax collections may occur if agricultural or timberland currently assessed under Washington's Current Use Special Valuation (CUSV) program is reassessed as non-productive and ineligible for tax exemptions under the CUSV program.

Data are insufficient to determine how much property may be subject to any of these types of reassessment, or what the net effect on property tax collections would be. Property tax reductions would occur if the project reduces the market value below the current assessed value, and the county reassessed the property. In 2010, the Clark County Assessor's office completed a study that specifically considered whether property values had been affected along potential route segments for the I-5 Project as a result of BPA's announcement that these route segments were being considered for the proposed project. Based on 2009 property sales data, this study found that no significant impact on market values from the consideration of these route segments for the proposed project had occurred. The 2009 sale prices appeared higher than the assessed value for the majority of transactions. Clark County recognized this data as an

indicator that the proposed project had not affected property sales and that adjustments to property value based on a property's potential proximity to the project would not be needed (Clark County Assessor's Office 2010).

Available data are insufficient to fully quantify the impacts, but even if the project impacted the value of some properties as described below in Section 12.2.2.5, Property Values, the project's overall impact on property tax revenues likely would be too small to have a discernible effect, relative to the influence of other factors, such as population and economic growth, and new development, and given that the area directly affected by the project is small compared to the total area of the affected counties (for more discussion of the project's potential impact on property values, see Section 11.2.2.5, Property Values).

### **Fuel Tax**

Undoubtedly some amount of tax would be collected from fuel consumption. The amount attributable to the project would depend on consumption and future fuel prices at the time of consumption; the actual amount cannot be reliably estimated from the data that is currently available.

### **Real-Estate Excise Tax**

The value of compensation paid to private landowners in Washington for easements and land purchased for the project would be subject to Washington's real estate excise tax (WAC 458-61A-111) unless the property is taken under condemnation or the imminent threat of condemnation. The amount of tax collected would vary depending on the amount of compensation negotiated for land and easements and their location.

### **Revenue from Washington State Trust Lands**

WDNR manages state trust lands to provide revenue for several trusts, primarily by producing timber. The project may create a short-term increase in the trusts' revenue from these lands by triggering the harvest of existing mature timber stock in and adjacent to new right-of-way and on any lands that would be occupied by a substation or access roads. Harvest of existing timber stock on existing right-of-way would likely not contribute to an increase in revenue for state trusts because this timber may be owned outright by BPA through fee-owned title or owned by BPA as reflected in the existing easement language.

The value of short-term increases in government revenue for each action alternative and substation site is quantified in Sections 11.2.3 through 11.2.7. Several assumptions are used to quantify the value of the trees that would be removed for construction of the project:

- The number of acres of timber managed by WDNR that would intersect with the proposed right-of-way, access roads, and substation sites (based on GIS analysis)
- The average volume of timber per acre, specific to WDNR-managed land in Clark and Cowlitz counties: 5,144.7 cubic feet per acre (U.S. Forest Service 2014)
- The percent of volume sold as merchantable timber, on average from public lands: 80 percent
- Value per MBF based on the stumpage price for Washington WDNR-managed timber sold in 2014: \$363.74/MBF (WDNR 2014b)

An additional, but currently unknown, number of trees would be cut adjacent to the right-of-way for safety purposes (danger trees) temporary access roads, staging areas, helicopter fly yards, and pulling and tensioning sites. This additional harvest would increase short-term revenue somewhat beyond the values reported in Sections 11.2.3 through 11.2.7. Any increase in revenue would be offset if WDNR decided to reduce harvest on other lands in response to the project-related harvest, but the extent of the offset is unknown. Additional revenue would come from BPA's payment of compensation for any state trust lands acquired for the project or for the easements themselves on trust lands. The appraisal process would also consider whether the transmission facilities would diminish the utility of a portion of the timberland property if the line effectively severs this area from the remaining property (severance damage).

The project would create long-term decreases in government revenue generated from state trust lands in three ways:

- Elimination or reduction of timber production on WDNR-managed timberlands that would be cleared in or next to the new right-of-way or for the substations and access roads
- Increase in the costs of managing WDNR-managed timberland near the new right-of-way, resulting, for example, from project-related restrictions on timber-harvest techniques, such as cable logging, or increases in risks to safety from logging near the right-of-way, the need for setback and offset distances of guy line cables to the right-of-way, and a potential for reconstructing existing landings outside of the right-of-way due to harvest restriction
- Reduction in the ability of WDNR managers to generate additional types of revenue, such as from growing trees to sequester carbon, on the cleared lands

The long-term decreases in government revenue for each action alternative, related to the impacts described in the first bullet above, are quantified in Sections 11.2.3 through 11.2.7. Measuring the impact requires converting the future impacts on timber-harvest revenue to an equivalent, single number, called the present value. This is done by calculating a perpetual annuity (which assumes timber would be harvested on rotation indefinitely). The perpetual annuity assumes average annual revenue per acre per year of about \$234, based on these assumptions:

- The number of acres of timber managed by WDNR that would intersect with the proposed right-of-way, access roads, and substation sites, where trees would not be allowed to grow after construction is complete (based on GIS analysis)
- The average volume of timber per acre, specific to WDNR-managed land in Clark and Cowlitz counties: 5,144.7 cubic feet per acre (U.S. Forest Service 2014)
- The allowable annual harvest per acre, using Von Mantel's formula for calculating the sustained annual yield, assuming a rotation length of 80 years ( $5,144.7/(80/2)$ ): 128.62
- Value per MBF, based on the stumpage price for Washington WDNR-managed timber sold in 2014 (assuming a constant price in real terms over time): \$363.74/MBF (WDNR 2014b)
- A discount rate of 4 percent per year (Row, Kaiser and Sessions 1981)

These assumptions result in a calculated present value of a perpetual annuity of about \$5,848 per acre. Data are unavailable to quantify the decrease in government revenue from the impacts associated with increased logging and management costs for land adjacent to the project, or management goals other than harvest. To the extent that each of these impacts occurs, potential mitigation for the decrease in government revenue is discussed in Section 11.2.8, Recommended Mitigation Measures.

The project likely would have **no** impact on the price of timber in regional markets because of offsetting changes from other timberland owners, although it may decrease the price at the local level temporarily during construction (a **low** impact). The response of other landowners would extend the actual impacts to a broader region than just locally. The decrease in revenue during operation may, in some years, exceed either Cowlitz or Clark county's average compensation cost per employee and have a **high** impact on the two counties.

### 11.2.2.5 Property Values

The proposed transmission line is not expected to have long-term impacts on property values in the area for a variety of reasons. Whenever land uses change, the concern is often raised about the effect the change may have on property values nearby. Zoning and permits are the primary means by which most local governments protect property values. By restricting some uses, or permitting them only under certain conditions, conflicting uses are avoided. Some residents consider transmission lines to be an incompatible use adjacent to residential areas. Nonetheless, the presence of transmission lines in residential areas is fairly common.

Appraisals conducted by licensed appraisers are the mechanism used to estimate property values. Factors such as size, amenities, condition and the selling price of comparable properties are generally used for such appraisals.

The question of whether nearby transmission lines can affect residential property values has been studied many times in the United States and Canada over the last 20 years or so, with mixed results. In the 1990s, BPA contributed to the research when it looked at the sale of 296 pairs of residential properties in the Portland, Oregon and Vancouver, Washington, metropolitan areas and in King County, Washington. The study evaluated subject properties adjoining 16 BPA high-voltage transmission lines (115-500 kV) and compared them with similar comparable property sales located away from transmission lines. All sales were in 1990 and 1991. Study results showed that the subjects in King County were worth about 1 percent less than their matched comparable sales, and the Portland/Vancouver area subjects were worth 1.46 percent more to 1.05 percent less (Cowger and Bottemiller 1996).

BPA updated this study in 2000 using 1994 to 1995 sales data, reviewing the sales of 260 pairs of residential properties in the King County and Portland/Vancouver metropolitan areas. The residential sales analysis identified a small but negative impact of from 0 to 2 percent for those properties adjacent to the transmission lines as compared to those where no transmission lines were present. Although this study identified a negative effect, the results are similar to the earlier study and the differences are relatively small (Bottemiller, et al. 2000). In 2003, the Appraisal Journal published a BPA article titled, "Further Analysis of Transmission Line Impact on Residential Property Values" (Wolverton and Bottemiller 2003). This article concluded that the data did not support a finding of a price effect on properties abutting high voltage transmission line rights-of-way.

Other studies include “High-Voltage Transmission Lines: Proximity, Visibility, and Encumbrances Effects,” by James Chalmers and Frank Voorvaart, published in *The Appraisal Journal* in 2009. This article concluded that half of the major studies evaluating property value effects from high voltage lines found no effect; the other half found property value declines of 3 to 6 percent, generally not beyond 200 to 300 feet from the lines, with declines dissipating over time.

BPA re-examined the potential impact of transmission lines on residential property values in urban areas. Based on a study of home sales between 2005 to 2007 (on homes sold adjacent to high voltage lines [115-500 kV] and comparable homes sold away from lines), the finalized findings for the new study in the Portland area (including Clark County, Washington, and Clackamas and Washington counties, Oregon) indicate declines in the overall average residential property values (\$291,122) of 1.65 percent. The Seattle metro area (King County, Washington) in the new study indicated a decline of 2.43 percent in the overall average priced home. However, higher-priced homes in the Seattle study with average selling prices of \$1,035,105 indicated a decline of 11.23 percent (Bottemiller 2012). The Seattle study, after the higher-priced homes were removed, indicated a decline in the average priced home (\$366,866) of 0.64 percent.

For rural areas, a 2010 study involved several hundred sales of rural land in various locations across central Wisconsin that considered the placement of the easement across the tract (Jackson 2010). Four location categories were used: middle, edge, clipping, and diagonal. The results indicated that property sales diminished by about 4 percent for the middle pattern and 2 percent for the diagonal pattern. No diminished property value was observed for either the edge or clipping pattern sales. An *Appraisal Journal* article in the Winter 2012 edition entitled “High-voltage Transmission Lines and Rural, Western Real Estate Values,” authored by James A. Chalmers, concluded “The research reported here is certainly consistent with the findings in the published literature that property value effects cannot be presumed and are generally infrequent.”

Studies of impacts during periods of physical change, such as new transmission line construction, generally have revealed greater short-term than long-term impacts. However, most studies have concluded that other factors, such as general location, size of property, improvements, condition, amenities, and supply and demand factors in a specific market area are far more important criteria than the presence or absence of transmission lines in determining the value of residential real estate. The Clark County Assessor’s office study conducted in 2010, referenced above, tends to support this conclusion.

The new transmission line would cross over or near current and potential future residential areas depending on the alternative (see Chapter 5, Land). A temporary decrease in property values (and salability) might occur on an individual basis as a result of the new transmission line for these and potentially for nearby properties along the action alternatives. However, these decreases would be highly variable, individualized, and unpredictable. Constructing the transmission line is expected to have **no** appreciably measurable impact on long-term residential property values along the action alternatives or in the general vicinity. Non-project impacts, along with other general market factors, are already reflected in the market value of properties in the area.

Timberlands cleared in or near the right-of-way that remain cleared and unable to produce timber would decrease in value because growing timber for production and revenue would be prohibited. In addition, if the right-of-way crossed in an orientation that separates a portion of

a parcel from another and it cannot be used as before (e.g., a “stranded [or severed] use”), the value of the whole parcel could be diminished. BPA would provide compensation to the owners of property BPA acquires or for which it secures an easement, or for other properties where the project would impair the owner’s reasonable use of the property. BPA would pay market value to nonfederal landowners established through the appraisal process for any new land rights required for this project. The appraisal process takes all factors affecting value into consideration, including the impact of transmission lines on property value. The appraisals may reference studies conducted on similar properties to support their conclusions. The strength of any appraisal depends on the individual analysis of the property, using neighborhood-specific market data to determine market value. Current sales at the time of appraisal reflecting economic conditions present in the market place at that time would be used, creating an appraisal that reflects appropriate value trends. Compensation for removing vegetation for new rights-of-way would be determined through the appraisal process for the new easement. For existing BPA rights-of-way, BPA would not pay for trees if they are already owned by BPA either through fee-owned title or through the existing easement. Payment for trees off the existing right-of-way, for example, danger trees, would depend on the terms of the existing easement.

Where BPA needs to acquire easements for additional access roads, and the landowner is the only other user, market compensation is generally 50 percent of the road’s full fee value. If other landowners share the access road, compensation is usually something less than 50 percent. For fully improved roads, the appraiser prepares an appraisal of the easement reflecting the current improved condition of the road together with the land value beneath the road. If BPA acquires an easement for the right to construct a new access road and the landowner has equal benefit and need of the access road, market compensation is generally 50 percent of full fee value of the land; if the landowner has little or no use for the new access road to be constructed, market compensation for the easement is generally close to full fee value of the land.

BPA projects rarely require relocating residents, businesses, or farm operations. Occasionally, personal property such as farm equipment or stored materials must be moved. Reasonable and necessary expenses for relocation of these items are fully reimbursable, unless the appraiser deems these items to be realty and compensated for in the property appraisal. BPA ensures that the landowner is fully informed of the relocation process if it appears that relocation would be necessary. The Federal Highway Administration's brochure entitled "Your Rights and Benefits as a Displaced Person," is available at the following website:

[http://www.fhwa.dot.gov/real\\_estate/publications/rights/](http://www.fhwa.dot.gov/real_estate/publications/rights/)

The Uniform Relocation Assistance and Real Property Acquisition Policies Act calls for fair and equitable treatment of those whose real property would be acquired or who would be displaced as a result of the project. In general, the act limits BPA to paying compensation equal to the fair market value of land purchased for the project or for the diminution in fair market value resulting from an easement or impairment of use. BPA may pay more than fair market value for a residential property if its current market value is less than the sum of mortgage and related debt the owner owes on it. That is, BPA would take into consideration current economic conditions. BPA would not pay compensation to owners of other property, such as residences outside but near the right-of-way, if they should experience a decline in market value.

BPA considers condemnation (exercising the power of eminent domain) as a last resort, and avoids using it as much as possible. BPA’s standard practice is to negotiate a mutually acceptable purchase agreement for new easements from landowners for the land rights needed

for the transmission lines, access roads, and substations. If, after good faith negotiations, BPA and a landowner are unable to agree on terms of a purchase, BPA would ask the U.S. Department of Justice to begin condemnation proceedings in the U.S. District Court on its behalf. A landowner may request that the condemnation process be used if they are unwilling to negotiate. In very limited cases, adjustments to right-of-way location may be made or feasible alternative means of access may be found.

### 11.2.2.6 Agricultural Production

The project would create short-term and long-term decreases in revenue farmers earn from agricultural production on lands directly affected by the project, if such production were prohibited. The decrease may be offset if a farmer is allowed to grow a substitute, less-profitable crop, but insufficient information exists to determine the size of this offset.

Construction of towers and access roads would permanently remove land from agricultural production. Operation of the new line may permanently restrict landowners' option to grow certain crops on the right-of-way. For agricultural land within existing BPA easements, the landowners may be able to reserve the right to grow and maintain non-woody, low-growing plants, such as annual row crops or vegetative cover that do not require structural support. For the purpose of this analysis, production of hay and silage, strawberries, and some nursery crops could be allowed within the right-of-way. Blueberries, grapes, and Christmas trees would not be allowed. If landowners desire to grow woody plants, structure-supported crops, or generally incompatible vegetation on an existing BPA right-of-way, they would need to contact BPA and secure a written agreement allowing such use if BPA determines that such use is safe and does not, or would not, cause any interference with the safe operation of the lines. The landowner would be restricted from planting any agricultural crops or vegetative cover including trees, shrubs, brush, or other vegetation covered by the reservation or written agreement within a 50-foot radius of all poles and towers.

Construction and maintenance of the project could cause crop damage, a temporary impact. BPA would assess and pay for any damage it caused according to the easement agreement. Typically there is little decrease in productivity or increase in management costs on agricultural land next to towers and access roads, or within the right-of-way for crops that are allowed to remain. If it were necessary to modify an irrigation system due to the construction of the transmission facilities, the appraisal process would include an estimate of the cost. If the landowner has reserved rights or entered into an agreement with BPA to grow crops within the right-of-way, the landowner would be responsible for the control of noxious weeds within the right-of-way if these weeds were not introduced by project construction. BPA does not conduct aerial spraying of herbicides, so drift is not an issue for agricultural production on land next to the right-of-way.

The project likely would have **no** impact on the overall demand, supply, or price of crops in the regional agricultural markets, although noticeable, but **low** impacts may occur if the affected lands would have produced solely for a niche market, such as locally grown, organic produce. Affected farmers may feel that the impact on their operations is larger, relative to the scale of their operations, than the overall market impact.

The short-term losses of production during construction activities and long-term decreases in revenue from agricultural land permanently removed from production for each action alternative are quantified in Sections 11.2.3 through 11.2.7. The analysis of long-term losses

assumes that the crop currently grown in the right-of-way would have been grown in perpetuity, and annual revenues are discounted at an annual rate of about 1.4 percent (U.S. Office of Management and Budget 2015). Potential tax impacts from revenue changes are discussed in Section 11.2.2.4, Government Revenue.

### **11.2.2.7 Private and Public Non-WDNR Timber Production**

The project may create a short-term increase and a long-term decrease in the revenue derived from timber production on private land and public land owned by local governments (City of Camas) for timber production. The short-term increase may occur if existing mature timber that otherwise would continue to grow would, instead, be harvested on lands that would be cleared in or adjacent to new right-of-way and on any lands that would be occupied by a substation or access roads. This would likely be the case where it is economically feasible for large commercial growers to harvest the timber themselves. For growers with smaller holdings, it may not be feasible to harvest the timber themselves; in this case, BPA would harvest the timber after an appraisal is completed and an easement is negotiated and secured. Landowners in this situation would experience increased revenue from BPA's payment rather than through direct timber harvest. Harvest of existing timber stock on existing right-of-way would likely not contribute to an increase in revenue for the landowner because this timber may be owned outright by BPA through fee-owned title or owned by BPA as reflected in existing easement language.

The values of short-term increases in revenue for each action alternative are quantified in Sections 11.2.3 through 11.2.7. Several assumptions are used to quantify the value of the trees that would be removed for construction of the project:

- The number of acres of timber by landowner that would intersect with the proposed right-of-way, access roads, and substation sites (based on GIS analysis)
- The average volume of timber per acre, specific to public or private land in Clark and Cowlitz counties: 5,144.7 cubic feet per acre for public land and 3,305.6 cubic feet per acre for private land (U.S. Forest Service 2014)
- The percent of volume sold as merchantable timber, on average from public lands and private lands: 80 percent and 45 percent, respectively
- Value per MBF, based on the stumpage price for Washington WDNR-managed timber sold in 2014: \$363.74/MBF (WDNR 2014b)

An additional, but currently unknown, number of trees would be cut adjacent to the right-of-way for safety purposes (danger trees), temporary access roads, staging areas, helicopter fly yards, and pulling and tensioning sites. This additional harvest would increase short-term revenue somewhat beyond the values reported in Sections 11.2.3 through 11.2.7. Any short-term increases in revenue could be offset if, because of the unplanned harvest on the cleared lands, landowners decide not to harvest trees on other lands. Additional revenue would come from BPA's payment of compensation for any lands acquired for the project or for the easements themselves on private or public timberlands. The appraisal process would also consider whether the transmission facilities would diminish the utility of a portion of the timberland property if the line effectively severs this area from the remaining property (severance damage).

The project would create long-term decreases in revenue derived from timber production in three ways:

- Elimination or reduction of timber production on private or public timberlands lands that would be cleared in or next to the new right-of-way or for the substations and access roads
- Increase in the costs of managing private or public timberland near the new right-of-way, resulting, for example, from project-related restrictions on timber-harvest techniques, such as cable logging, greater risks to safety from logging near the right-of-way, the need for setback and offset distances of guy line cables to the right-of-way corridor, and a potential for reconstructing existing landings outside of the right-of-way due to harvest restriction
- Elimination or reduction of the potential to generate non-harvest related revenue (e.g., payments for ecosystem services, such as carbon sequestration or habitat protection) on private timberlands that would be cleared in or next to the new right-of-way or for the substations and access roads

The long-term decreases in revenue for each action alternative, related to the impacts described in the first bullet above, are quantified in Sections 11.2.3 through 11.2.7. Measuring the impact entails converting the future impacts on timber-harvest revenue to an equivalent, single number, called the present value. This is done by calculating a perpetual annuity (which assumes timber would be harvested on rotation indefinitely). The perpetual annuity assumes average annual revenue per acre per year of about \$234 for public timberlands and \$301 for private timberlands, based on these assumptions:

- The number of acres of timber owned by public and private landowners that would intersect with the proposed right-of-way, access roads, and substation sites, where trees would not be allowed to grow after construction is complete (based on GIS analysis)
- The average volume of timber per acre, specific to public or private land in Clark and Cowlitz counties: 5,144.7 cubic feet per acre for public land and 3,305.6 cubic feet per acre for private land (U.S. Forest Service 2014)
- The allowable annual harvest per acre, using Von Mantel's formula for calculating the sustained annual yield, assuming a rotation length of 80 years for public and 40 years for private timberlands (inventory per acre divided by rotation length/2): 128.62 and 165.28, respectively
- Value per MBF, based on the stumpage price for Washington WDNR-managed timber sold in 2014 (assuming a constant price in real terms over time): \$363.74/MBF (WDNR 2014b)
- A discount rate of 4 percent per year (Row, Kaiser and Sessions 1981)

These assumptions result in a calculated present value (as a perpetual annuity) of about \$5,848 per acre for public timberlands and \$7,515 per acre for private timberlands. The decrease in revenue is reported for the acres of trees within right-of-way newly acquired for this project. For existing right-of-way, BPA likely has already negotiated compensation for forgone future revenue from timber production. Data are unavailable to quantify the decrease in government revenue from the impacts associated with increased logging and management costs for land

adjacent to the project, or management goals other than harvest. To the extent that each of these impacts occurs, potential mitigation for the decrease in government revenue is discussed in Section 11.2.8, Recommended Mitigation Measures.

The project likely would have **no** impact on the price of timber in regional markets, although it may decrease the price at the local level temporarily during construction (a **low** impact). Actual impact would depend not just on the project's direct impact on the timber-harvest level, but also on the extent to which forest landowners adjust harvest on other lands in response.

### **11.2.2.8 Community Values**

BPA received many comments about the potential effects the project could have on existing quality of life and other values. The following sections evaluate how the alternatives could generally affect people who hold these values.

#### **Quality of Life**

The project could affect the well-being of residents by altering the supply of amenities, such as cohesive neighborhoods and the natural environment, that reflect the area's social capital (productive relationships among individuals and entities) and natural capital (the natural environment). The project, itself a form of human-built capital, could directly affect the level of social capital and natural capital in the project area. The project could create long-term increases in well-being, for example, if it increases the value of amenities, such as by promoting greater goodwill among citizens having an interest in the project. It could cause long-term decreases in well-being, for example, if it generates discord between individuals with different views about the project's desirability.

#### **Property-Related Amenities**

The project would cause short-term decreases in the value of amenities, such as peace and quiet, for residents that would be affected by increased noise, traffic, and other aspects of construction. It would cause long-term decreases in the value of amenities, such as being close to forested open space and far from industrialized lands, for residents of properties near the transmission line, substations, and access roads.

#### **Public Health and Safety**

The project could create a short-term decrease in the economic well-being of workers or others who experience a project-related illness or accident during the construction period. Fatalities or chronic conditions from project-related illnesses and accidents could cause long-term decreases in well-being for construction workers and their families. Industry-wide illness and fatality rates suggest workers could experience about nine injuries, one illness, and a small chance of a fatality directly from working on the project during the year with the peak level of activity, with lower levels during periods with less intense activity (U.S. Department of Labor, Bureau of Labor Statistics 2009). The public could experience accidental injuries or deaths during construction and operation of the transmission line and substations. The economic costs of injuries, illnesses, and deaths could be large to individuals and their families, but likely would not have a discernible effect on the overall value of safety and health for the public.

The project would create a long-term decrease in the well-being of landowners, residents, workers, and visitors who perceive that the project would expose them to higher risks from EMF, electrocution, and project-related accidents.

### **Recreation and Tourism**

The project would cause a short-term, temporary decrease in the value of recreational activities on affected lands and waters as construction displaces or interferes with recreation. It would cause a long-term, permanent increase in the value some people derive from recreational activities where new or improved access roads enhance accessibility or other qualities people desire (e.g., improved visibility or hunting quality from clearings). The project would cause a long-term permanent decrease in the value some people derive from recreational activities if the project diminishes accessibility, visual aesthetics, sense of solitude, or other characteristics people desire or currently enjoy (see Chapter 6, Recreation).

Changes in the value of recreational opportunities resulting from the project would affect the behavior of recreationists, who likely would make fewer visits to areas they perceive as having lower value and more visits to areas they perceive as having higher value. Where the right-of-way and access roads would cross forest habitat, for example, wildlife watchers may make fewer trips to see species that depend on nonfragmented forest and more trips to see those that prefer forest edges. The changes in behavior may occur entirely within the project area or they may extend beyond its boundaries. In response to any reduction in the value of hiking opportunities in the area, for example, some hikers might decide to go hiking on other unaffected trails within the project area, or choose to travel to trails outside of the project area. To the extent that the project's effects on recreation resources lead recreationists to alter their spending patterns, it would affect levels of sales, employment, and earnings in related businesses and government agencies that collect revenue from recreational fees and spending.

### **Natural Environment**

The project would cause long-term decreases in the value of the benefit some people enjoy from the existence of the plants, animals, and other resources that the project would affect. Some impacts would occur through the reduced value of recreation and tourism, as described above. Additional decreases in value would occur from and via increased costs for taxpayers, landowners, and others to anticipate, monitor, and respond to impacts to the natural environment.

### **Transmission System Reliability**

The project would create long-term increases in the contribution of BPA's transmission system to the economic well-being of electricity consumers. The project would allow BPA to meet its obligations to provide firm transmission service to its customers. By improving the reliability of electricity delivery in the region, the project would encourage businesses that need high-quality power to locate and invest in the area, which could provide jobs. Improved reliability would allow commercial, industrial, and residential consumers to avoid costs from power interruptions, such as a business losing revenues when it must cease production, residents losing food to spoilage, or police responding to accidents when traffic controls fail.

### 11.2.2.9 Environmental Justice

Evaluating whether a proposed action could have disproportionately high and adverse impacts on minority or low income populations typically involves: 1) identifying any potential high and adverse environmental or human health impacts, 2) identifying any minority or low income communities within the potential high and adverse impact areas, and 3) examining the spatial distribution of any minority or low income communities to determine if they would be disproportionately affected by these impacts.

Identified minority and low-income populations are described in Section 11.1.9, Environmental Justice. BPA completed the analysis of impacts to minority or low-income population groups with the following approach and assumptions:

- Impacts are considered disproportionate if they affect minority or low income populations at higher rates than respective county minority or low income populations. In other words, if the populations impacted by the project are reported as minority or low income at greater rates than county populations, those minority or low income populations are considered disproportionately impacted by the project. State data was also presented in Section 11.1.9, but the comparison to county-level data avoids the “masking” or “diluting” of the presence of minority and low income populations, per CEQ and EPA guidelines.
- Disproportionate impacts to minority or low income populations do not occur if there are no minority populations crossed by the project (as compared to county data).
- BPA did not evaluate level of impact if minority or low-income populations were identified, but were not disproportionately impacted by the project.

Using CEQ criteria, three minority populations in Cowlitz and Clark counties were identified out of the 80 block groups (representing 43 census tracts) crossed by the project. The spatial distribution and number of minority populations, compared with the entire project and affected block groups and counties, indicate these minority populations would not be disproportionately impacted by the project.

Overall, although five out of the 43 census tracts crossed by the project reported low-income populations in 2013, the median household incomes of these census tracts were higher than the respective county incomes, and poverty rates in these census tracts were lower than the county (and state) poverty rates. The spatial distribution of low-income census tracts, compared with the entire project and affected census tracts and counties, indicate these populations would not be disproportionately impacted by the project.

Because none of the action alternatives would have a disproportionate impact on identified minority or low-income populations, impact levels were not evaluated.

Environmental Justice, according to the EPA (2015c), is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that “no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies.” Meaningful involvement means that “people have an opportunity to participate in decisions about activities that may affect their environment and/or

health, the public’s contribution can influence the regulatory agency’s decision, public concerns will be considered in the decision making process, and the decision makers seek out and facilitate the involvement of those potentially affected.”

To that end, BPA has considered all input from persons or groups regardless of race, income status, or other social and economic characteristics. Public scoping was held for the project and included an extended public comment period. Interested parties were encouraged to provide written comments on the Draft EIS via the project website, U.S. mail, or fax, and telephone (see Section 1.6, Public Involvement and Major Issues). All comments received were posted on the project website: <http://www.bpa.gov/goto/i-5> and have been addressed in this Final EIS (see Volume 3, Comments and Responses).

BPA has engaged public stakeholders and potentially affected populations to incorporate the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income in the I-5 project area, in compliance with the goals and procedures of Executive Order 12898.

### 11.2.2.10 Sundial Substation Site

As discussed in Chapter 3 of this EIS, BPA is in the process of discussions with the Port of Portland to purchase Lots 11 and 12 within the Port’s Troutdale Reynolds Industrial Park, in Multnomah County. BPA is interested in purchasing these lots for potential long-term transmission system needs, regardless of whether a decision is made to build the I-5 project. Either one of these two options could be used for the Sundial Substation. Since BPA is a federal agency, it does not pay property taxes to Multnomah County. Acquisition by BPA of Lots 11 and 12 would cause a long-term decrease in revenue to the county, a **moderate** impact, although it likely would not diminish the county’s workforce and infrastructure.

## 11.2.3 Castle Rock Substation Sites

### 11.2.3.1 Casey Road

BPA would purchase the property for the Casey Road site and access road from the state of Washington through WDNR. WDNR manages the property for timber harvest and it also is classified as farmland of statewide importance. Portions of the property have been recently logged. Timber harvested from the site during construction would create a short-term increase of about \$282,035 in timber-harvest revenue from state trust lands (see Section 11.2.2.4, Government Revenue, for assumptions). Logging this timber would produce revenues for the Scientific Schools Trust and State Forest Lands. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. Converting this property from state trust land to a substation site would cause a long-term decrease in state revenue from forgone future harvests with a total present value of \$220,344 (see Section 11.2.2.4 for assumptions). The loss of future tax revenues from the site could have a **moderate** impact on Cowlitz County’s ability to meet all demands for public services, although it would not diminish the county’s workforce and infrastructure.

Impacts common to action alternatives are in Section 11.2.2. The remaining sections discuss impacts unique to each alternative, and recommended mitigation measures.

### 11.2.3.2 Baxter Road

BPA would purchase the property for the substation site and access road from Sierra Pacific Industries. The property is classified as farmland of statewide importance and is used for timber harvest. Sierra Pacific Industries paid \$1,109 in property taxes for the parcel to Cowlitz County in 2014. This represented about 0.001 percent of total property tax collections in Cowlitz County in 2014. Because BPA would not pay property taxes once it acquires the property, the project would cause a long-term decrease in annual property tax collections in Cowlitz County.

During construction, timber harvests from clearing the site would increase timber-harvest tax revenue by about \$5,000 for Cowlitz County and about \$1,300 in state revenue. Precluding future timber harvests on the site during operation would cause a long-term decrease in state and county timber-harvest taxes, with a total present value of about \$14,000 for Cowlitz County and about \$3,500 for the state.

Timber harvests from clearing the site would also cause a short-term increase of about \$127,718 in the revenue derived from timber production on private land (see Section 11.2.2.7, Private and Non-WDNR Public Timber Production, for assumptions). Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. Converting the land from private timber production would cause a long-term decrease in revenue for Sierra Pacific Industries, with a present value of about \$354,771 from forgone future timber harvests (see Section 11.2.2.7, Private and Non-WDNR Public Timber Production, for assumptions).

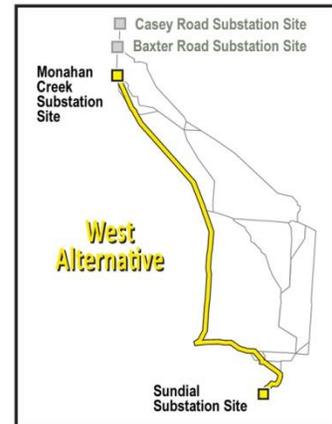
Loss of future tax revenues from the site could have a **moderate** impact on Cowlitz County's ability to meet all demands for public services, although it would not diminish the county's workforce and infrastructure. The change in timber production likely would have no impact on market prices for timber.

### 11.2.3.3 Monahan Creek

BPA would purchase the property for the substation and access road. The property is classified as farmland of statewide importance and prime farmland. Trees cover portions of the property; other portions are used for grazing. The landowners paid \$1,529 in property taxes to Cowlitz County in 2014. This amount was about 0.001 percent of total property tax collections in Cowlitz County in 2014. Because BPA would not pay property taxes once it would acquire the property, the project would create a long-term decrease in annual property tax collections in Cowlitz County. The loss of future property tax revenues could have a **low** impact on Cowlitz County's ability to meet all demands for public services, although it would not diminish the county's workforce and infrastructure.

## 11.2.4 West Alternative and Options

The only socioeconomic factors that would vary under the West Alternative and its options are government revenue, agricultural production, and private timber production. This is also true of the other three alternatives and their options. Accordingly, the following discussions of the action alternatives focus on these three socioeconomic factors.

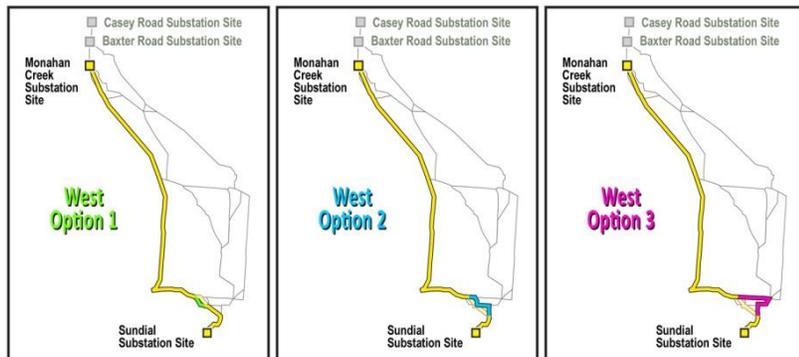


### 11.2.4.1 Government Revenue

The West Alternative would affect government revenue in Washington from state trust lands and from timber-harvest taxes.

#### Washington State Trust Land Revenue

During construction, the West Alternative would cause an increase of about \$4,096 in timber-harvest revenue from state trust lands by triggering harvest of existing mature timber stock on lands cleared for the project (see Table 11-5).



Greater increases during construction would occur for West Option 3. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. The increase would be somewhat greater than the values calculated here if BPA needs to clear danger trees, or for temporary access roads, staging areas, helicopter fly yards, and pulling and tensioning sites. The actual increase could be greater or less than the total increase calculated here, depending on how actual conditions on the ground deviate from average and assumed conditions (see Section 11.2.2.4, Government Revenue, for assumptions). The short-term increase in revenue during construction is a small change (a fraction of a percent) compared to the annual statewide revenue for the trusts, which was \$142 million in 2014.

**Table 11-5 Value of Timber Cleared From State Trust Lands (in 2014 dollars)<sup>1,2,3</sup>**

Alternatives and Options	Trust							Total
	Capitol Building	Institutions <sup>4</sup>	Common School	Agricultural	Scientific School	State Forest Lands <sup>5</sup>		
						Clark	Cowlitz	
<b>West Alternative</b>	\$0	\$0	\$4,096	\$0	\$0	\$0	\$0	\$4,096
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 3	N/C	N/C	+\$59,713	N/C	N/C	N/C	N/C	+\$59,713
<b>Central Alternative<sup>6</sup></b>	<b>\$318,838</b> <b>(\$262,359)</b>	<b>\$230,682</b> <b>(\$244,915)</b>	<b>\$1,124,903</b> <b>(\$1,186,818)</b>	<b>\$3,889</b> <b>(\$3,214)</b>	<b>\$168,308</b> <b>(\$174,984)</b>	<b>\$1,268,972</b> <b>(1,468,396)</b>	<b>\$209,500</b> <b>(\$209,599)</b>	<b>\$3,325,092</b> <b>(\$3,550,284)</b>
Central Option 1 <sup>6</sup>	N/C (N/C)	N/C (N/C)	+\$67,933 (+\$21,761)	+\$16,586 (N/C)	+\$48,283 (+\$134,096)	N/C (N/C)	+\$288,786 (+\$292,499)	+\$421,588 (+\$448,356)
Central Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 3	N/C	N/C	-\$119,515	N/C	N/C	-\$585,899	N/C	-\$705,414
<b>East Alternative</b>	<b>\$71,430</b>	<b>\$0</b>	<b>\$472,439</b>	<b>\$0</b>	<b>\$2,867</b>	<b>\$530,748</b>	<b>\$488,558</b>	<b>\$1,566,043</b>
East Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 2	+\$88,279	N/C	+\$165,563	N/C	-\$2,867	+\$376,091	N/C	+\$627,066
East Option 3	N/C	N/C	+\$170,925	N/C	N/C	+\$212,988	N/C	+\$383,913
<b>Crossover Alternative</b>	<b>\$71,430</b>	<b>\$0</b>	<b>\$827,650</b>	<b>\$0</b>	<b>\$84,618</b>	<b>\$1,092,305</b>	<b>\$209,599</b>	<b>\$2,285,603</b>
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Notes:

N/C – No net change from the action alternative

- The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.
- Calculated for timber that would be cleared from the right-of-way, substations, and access roads.
- Totals may not sum due to rounding. See Section 11.2.2.4, Government Revenue, for assumptions used to quantify these values.
- Includes charitable, educational, penal, and reformatory institutions.
- Represents the revenue from timber harvests in Clark and Cowlitz counties; actual revenue impacts to the counties would vary depending on a variety of factors that are adjusted annually. In recent years, counties received about 70 percent of total harvest revenue from State Forest Lands.
- Impact numbers not shown in parentheses reflect updated data, assumptions, and design refinements; impact numbers shown in parentheses reflect updated data and assumptions using the Draft EIS design.

Sources: BPA 2015; Corelogic 2015; Herrera 2010; Warren 2009; WDNR 2014a, 2014b

Over the life of the project, the West Alternative would decrease revenue from future timber harvests that would have occurred on land required for the project, with a net present value of about \$3,200 (see Table 11-6). Greater decreases would occur with West Option 3. The impact would be slightly greater than the values calculated here if BPA continues to clear danger trees. The actual impact could be greater or less than the total increase calculated here, depending on how actual conditions on the ground deviate from average and assumed conditions (see Section 11.2.2.4, Government Revenue, for assumptions). On an annualized basis, the long-term decrease likely would be small, relative to the annual statewide timber sales for each trust.

The revenue reduction likely would have a **moderate** impact on Cowlitz County's ability to meet all demands for public services, although it would not diminish the county's workforce and infrastructure.

**Table 11-6 Net Present Value of Revenue from Future Timber Harvests that Would Have Occurred on State Trust Lands but for the Project (in 2014 dollars)<sup>1,2,3,4</sup>**

Alternatives and Options	Trust							Total
	Capitol Building	Insti-tutions <sup>5</sup>	Common School	Agri-cultural	Scientific School	State Forest Lands <sup>6</sup>		
						Clark	Cowlitz	
<b>West Alternative</b>	\$0	\$0	\$3,200	\$0	\$0	\$0	\$0	\$3,200
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 3	N/C	N/C	+\$46,651	N/C	N/C	N/C	N/C	+\$46,651
<b>Central Alternative<sup>7</sup></b>	<b>\$249,097 (\$204,972)</b>	<b>\$180,224 (\$191,344)</b>	<b>\$878,848 (\$927,219)</b>	<b>\$3,038 (\$2,511)</b>	<b>\$131,493 (\$136,709)</b>	<b>\$991,404 (\$1,147,207)</b>	<b>\$163,675 (\$163,753)</b>	<b>\$2,597,779 (\$2,773,714)</b>
Central Option 1 <sup>7</sup>	N/C (N/C)	N/C (N/C)	+\$53,074 (+\$17,001)	+\$12,958 (N/C)	+\$37,722 (+\$104,764)	N/C (N/C)	+\$225,618 (+\$228,519)	+\$329,372 (+\$350,285)
Central Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Central Option 3	N/C	N/C	-\$93,373	N/C	N/C	-\$457,742	N/C	-\$551,115
<b>East Alternative</b>	<b>\$55,806</b>	<b>\$0</b>	<b>\$369,100</b>	<b>\$0</b>	<b>\$2,240</b>	<b>\$414,655</b>	<b>\$381,693</b>	<b>\$1,223,495</b>
East Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 2	+\$68,969	N/C	+\$129,349	N/C	-\$2,240	+\$293,827	N/C	+\$489,905
East Option 3	N/C	N/C	+\$133,538	N/C	N/C	+\$166,400	N/C	+\$299,938
<b>Crossover Alternative</b>	<b>\$55,806</b>	<b>\$0</b>	<b>\$646,614</b>	<b>\$0</b>	<b>\$66,109</b>	<b>\$853,380</b>	<b>\$163,753</b>	<b>\$1,785,662</b>
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C

## Notes:

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Calculated for timber that would be cleared from the right-of-way, substations, and access roads.

3. Totals may not sum due to rounding. See Section 11.2.2.4, Government Revenue, for assumptions used to quantify these values.

4. Calculated in perpetuity.

5. Includes charitable, educational, penal, and reformatory institutions.

6. Represents the revenue from forgone timber harvests in Clark and Cowlitz counties; actual revenue impacts to the counties would vary depending on a variety of factors that are adjusted annually. In recent years, counties received about 70 percent of total harvest revenue from State Forest Lands.

7. Impact numbers not shown in parentheses reflect updated data, assumptions, and design refinements; impact numbers shown in parentheses reflect updated data and assumptions using the Draft EIS design.

Sources: BPA 2015; Corelogic 2015; Herrera 2010; Warren 2009; WDNR 2014a, 2014b

## Tax Revenue from Private Timber Harvest

During construction, the West Alternative would cause an increase of about \$24,932 (see Table 11-7) in the timber-harvest tax revenue of affected counties and the state government in Washington by triggering harvest of existing mature timber stock on private lands cleared for the project. This near-term increase would be the same with West Options 1 and 2, but larger with West Option 3. The West Alternative also would cause a long-term decrease in timber-harvest tax revenue during operation, by precluding future timber production on the cleared lands, with a total net present value of about \$69,257 (see Table 11-8). This long-term decrease would be the same with West Options 1 and 2, but larger with West Option 3. The short-term increase and long-term decrease in timber-tax revenue would represent small changes compared to the annual tax-revenue collections from harvests in Clark and Cowlitz counties.

The revenue reduction likely would have a **moderate** impact on Cowlitz County's ability to meet all demands for public services, although it would not diminish the county's workforce and infrastructure. The change in timber production likely would have no impact on market prices for timber.

**Table 11-7 Value of Tax Revenue from Timber Cleared from Private Timberlands**  
(in 2014 dollars)<sup>1,2,3</sup>

Alternatives and Options	Tax Revenue Recipient			Total
	Cowlitz County	Clark County	State of Washington	
<b>West Alternative</b>	<b>\$19,871</b>	<b>\$0</b>	<b>\$4,986</b>	<b>\$24,932</b>
West Option 1	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	N/C
West Option 3	N/C	+\$6,347	+\$1,587	+\$7,933
<b>Central Alternative<sup>4</sup></b>	<b>\$73,159</b> <b>(\$72,043)</b>	<b>\$37,220</b> <b>(\$38,346)</b>	<b>\$27,597</b> <b>(\$27,597)</b>	<b>\$137,974</b> <b>(\$137,986)</b>
Central Option 1 <sup>4</sup>	-\$2,514 (-\$2,250)	N/C (N/C)	-\$628 (-\$563)	-\$3,142 (-\$2,813)
Central Option 2	-\$8,423	N/C	-\$2,106	-\$10,529
Central Option 3	-\$537	-\$12,923	-\$3,365	-\$16,825
<b>East Alternative</b>	<b>\$91,999</b>	<b>\$45,740</b>	<b>\$34,435</b>	<b>\$172,174</b>
East Option 1	-\$9,426	N/C	-\$2,356	-\$11,782
East Option 2	N/C	-\$9,287	-\$2,322	-\$11,608
East Option 3	N/C	-\$1,397	-\$349	-\$1,746
<b>Crossover Alternative</b>	<b>\$20,519</b>	<b>\$52,976</b>	<b>\$18,374</b>	<b>\$91,868</b>
Crossover Option 1	N/C	N/C	N/C	N/C
Crossover Option 2	+\$6,123	N/C	+\$1,531	+\$7,654
Crossover Option 3	+\$10,543	N/C	+\$2,636	+\$13,179

**Notes:**

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Calculated for timber that would be cleared from the right-of-way and access roads.

3. Totals may not sum due to rounding.

4. Impact numbers not shown in parentheses reflect updated data, assumptions, and design refinements; impact numbers shown in parentheses reflect updated data and assumptions using the Draft EIS design.

Sources: BPA 2015; Clark County 2015b; Corelogic 2015; Cowlitz County 2015b; Herrera 2010; Warren 2009; WDNR 2014a, 2014b

**Table 11-8 Net Present Value of Tax Revenue From Future Timber Harvests that Would Have Occurred on Private Timberlands but for the Project (in 2014 dollars)<sup>1,2,3,4</sup>**

Alternatives and Options	Tax Revenue Recipient			Total
	Cowlitz County	Clark County	State of Washington	
<b>West Alternative</b>	<b>\$55,198</b>	<b>\$208</b>	<b>\$13,851</b>	<b>\$69,257</b>
West Option 1	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	N/C
West Option 3	N/C	+\$17,630	+\$4,407	+\$22,037
<b>Central Alternative<sup>5</sup></b>	<b>\$203,219 (\$200,119)</b>	<b>\$103,390 (\$106,517)</b>	<b>\$76,652 (\$76,659)</b>	<b>\$383,261 (\$383,295)</b>
Central Option 1 <sup>5</sup>	-\$6,983 (-\$6,250)	N/C (N/C)	-\$1,746 (-\$1,563)	-\$8,729 (-\$7,813)
Central Option 2	-\$23,399	N/C	-\$5,850	-\$29,248
Central Option 3	-\$1,492	-\$35,897	-\$9,347	-\$46,736
<b>East Alternative</b>	<b>\$255,553</b>	<b>\$127,055</b>	<b>\$95,652</b>	<b>\$478,260</b>
East Option 1	-\$26,183	N/C	-\$6,546	-\$32,728
East Option 2	N/C	-\$25,796	-\$6,449	-\$32,245
East Option 3	N/C	-\$3,881	-\$970	-\$4,851
<b>Crossover Alternative</b>	<b>\$56,996</b>	<b>\$147,156</b>	<b>\$51,038</b>	<b>\$255,190</b>
Crossover Option 1	N/C	N/C	N/C	N/C
Crossover Option 2	+\$17,009	N/C	+\$4,252	+\$21,261
Crossover Option 3	+\$29,286	N/C	+\$7,322	+\$36,608

## Notes:

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Calculated for timber that would be cleared from the right-of-way and access roads.

3. Totals may not sum due to rounding.

4. Calculated in perpetuity.

5. Impact numbers not shown in parentheses reflect updated data, assumptions, and design refinements; impact numbers shown in parentheses reflect updated data and assumptions using the Draft EIS design.

Sources: BPA 2015; Clark County 2015b; Corelogic 2015; Cowlitz County 2015b; Herrera 2010; Warren 2009; WDNR 2014a, 2014b

### 11.2.4.2 Agricultural Production

During construction, the West Alternative would cause a decrease in revenue of about \$458,800 by removing crops both inside and outside of the right-of-way (see Table 11-9). Some of this removal would be temporary; for example, crops removed for a temporary access road across an agricultural field needed for access to the right-of-way. The decrease would be larger with West Options 1, 2, and 3. This represents a small proportion of the annual agricultural production revenues in Cowlitz, Clark, and Multnomah counties (about 0.3 percent of the revenue generated in 2012, in 2014 dollars). The decrease could be a greater proportion of agricultural revenue for individual landowners.

Over the life of the project, operation of the West Alternative would cause a decrease in revenue, with a net present value of about \$4.5 million, by permanently eliminating landowners' ability to produce crops within the tower footprints (see Table 11-10). This long-term decrease

would be larger with West Options 1, 2 and 3. Landowners may not grow crops over 4 feet or crops requiring support structures within the entire right-of-way. Assuming landowners stop growing these crops in the right-of-way, the West Alternative would cause an additional long-term decrease in revenue, with a net present value of about \$20.5 million (see Table 11-10). The decrease would be the same under all options. The long-term decrease would be small, relative to the annual value of agricultural production in Cowlitz, Clark, and Multnomah counties. The decrease could be proportionally more significant for an individual landowner.

The change in agricultural production likely would have **no** impact on regional prices for agricultural products. At the local level, impacts could be **low-to-moderate** if local prices for a particular product are affected by limited supply.

**Table 11-9 Value of Crops Removed from Production During Construction (in 2014 dollars)<sup>1,2,3,4</sup>**

Alternatives and Options	Type of Crop							Total
	Blue-berries	Christmas Trees	Field Corn	Grapes <sup>5</sup>	Hay/Silage	Nursery Stock	Pasture	
<b>West Alternative</b>	<b>\$0</b>	<b>\$64,100</b>	<b>\$0</b>	<b>\$93,600</b>	<b>\$6,200</b>	<b>\$287,100</b>	<b>\$7,700</b>	<b>\$458,800</b>
West Option 1	N/C	N/C	N/C	N/C	+\$60	N/C	+\$30	+\$90
West Option 2	N/C	N/C	N/C	N/C	-\$820	N/C	+\$1,300	+\$400
West Option 3	N/C	N/C	N/C	N/C	-\$520	N/C	+\$740	+\$200
<b>Central Alternative<sup>6</sup></b>	<b>\$0 (\$0)</b>	<b>\$100 (\$2,300)</b>	<b>\$1,270 (\$21,000)</b>	<b>\$0 (\$0)</b>	<b>\$400 (\$1,100)</b>	<b>\$0 (\$0)</b>	<b>\$900 (\$900)</b>	<b>\$2,700 (\$25,300)</b>
Central Option 1 <sup>6</sup>	N/C (N/C)	N/C (N/C)	N/C (N/C)	N/C (N/C)	N/C (N/C)	N/C (N/C)	N/C (N/C)	N/C (N/C)
Central Option 2	N/C	N/C	N/C	N/C	-\$100	N/C	+\$1,000	+\$800
Central Option 3	+\$35,000	N/C	N/C	N/C	+\$500	N/C	+\$300	+\$35,900
<b>East Alternative</b>	<b>\$0</b>	<b>\$0</b>	<b>\$21,000</b>	<b>\$0</b>	<b>\$1,000</b>	<b>\$0</b>	<b>&gt;\$0</b>	<b>\$22,000</b>
East Option 1	N/C	N/C	N/C	N/C	-\$100	N/C	+\$500	+400
East Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<b>Crossover Alternative</b>	<b>\$0</b>	<b>\$2,300</b>	<b>\$21,000</b>	<b>\$0</b>	<b>\$1,000</b>	<b>\$0</b>	<b>\$1,800</b>	<b>\$26,000</b>
Crossover Option 1	N/C	N/C	-\$700	N/C	+\$1,800	N/C	+\$1,400	+\$2,500
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Notes:

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Calculated for crops that would be cleared from the right-of-way and access roads.

3. Totals may not sum due to rounding.

4. Calculated in perpetuity.

5. Grapes are the crop produced on land the Washington State Department of Agriculture data classifies as a vineyard.

6. Impact numbers not shown in parentheses reflect updated data, assumptions, and design refinements; impact numbers shown in parentheses reflect updated data and assumptions using the Draft EIS design.

Sources: BPA 2015; Cross et al. 1991; Julian et al. 2011; Seavert and Horneck 2014; USDA NASS 2014a, 2014b; Washington State Department of Agriculture 2013

**Table 11-10 Net Present Value of Revenue from Crops that Farmers Would Have Grown but for the Project (in 2014 dollars)<sup>1,2,3</sup>**

Alternatives and Options	Type of Crop							Total
	Blue-berries	Christ-mas Trees	Field Corn	Grapes <sup>4</sup>	Hay/Silage	Nursery Stock	Pasture	
<b>Crops on Land that Would be Occupied by Tower Footprints and Access Roads within and outside Right-of-Way</b>								
<b>West Alternative</b>	\$0	\$564,000	\$0	\$1,012,000	\$57,700	\$2,780,000	\$66,400	\$4,480,000
West Option 1	N/C	N/C	N/C	N/C	-\$1,300	N/C	+\$2,700	+\$1,500
West Option 2	N/C	N/C	+\$129,100	N/C	+\$4,700	N/C	+\$11,900	+\$133,100
West Option 3	N/C	N/C	+\$267,200	N/C	+\$4,300	N/C	+\$3,800	+\$262,100
<b>Central Alternative<sup>6</sup></b>	\$0 (\$0)	\$5,410 (\$130,000)	\$301,700 (\$267,200)	\$0 (\$0)	\$14,500 (\$17,000)	\$0 (\$0)	\$12,800 (\$15,100)	\$334,400 (\$428,500)
Central Option 1 <sup>6</sup>	N/C (N/C)	N/C (N/C)	N/C (N/C)	N/C (N/C)	N/C (N/C)	N/C (N/C)	N/C (N/C)	N/C (N/C)
Central Option 2	N/C	N/C	N/C	N/C	-\$4,400	N/C	+\$4,300	-\$100
Central Option 3	+\$553,700	N/C	N/C	N/C	+\$3,400	N/C	-\$400	+\$556,700
<b>East Alternative</b>	\$0	\$0	\$267,200	\$0	\$17,300	\$0	\$2,700	\$287,200
East Option 1	N/C	N/C	N/C	N/C	-\$4,400	N/C	+\$5,800	+\$1,440
East Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
East Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<b>Crossover Alternative</b>	\$0	\$130,200	\$267,200	\$0	\$12,600	\$0	\$21,800	\$110,000
Crossover Option 1	N/C	N/C	-\$37,800	N/C	+\$11,500	N/C	+\$14,400	-\$11,900
Crossover Option 2	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 3	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<b>Crops not Allowed in the Right-of-Way<sup>5</sup></b>								
<b>West Alternative</b>	\$0	\$3,020,700		\$4,218,800		\$13,263,700		\$20,502,500
West Option 1	N/C	N/C		N/C		N/C		N/C
West Option 2	N/C	N/C		N/C		N/C		N/C
West Option 3	N/C	N/C		N/C		N/C		N/C
<b>Central Alternative<sup>6</sup></b>	\$0 (\$0)	\$0 (\$0)		\$0 (\$0)		\$0 (\$0)		\$0 (\$0)
Central Option 1 <sup>6</sup>	N/C (N/C)	N/C (N/C)		N/C (N/C)		N/C (N/C)		N/C (N/C)
Central Option 2	N/C	N/C		N/C		N/C		N/C
Central Option 3	+\$1,330,200	N/C		N/C		N/C		+\$1,330,200
<b>East Alternative</b>	\$0	\$0		\$0		\$0		\$0
East Option 1	N/C	N/C		N/C		N/C		N/C
East Option 2	N/C	N/C		N/C		N/C		N/C
East Option 3	N/C	N/C		N/C		N/C		N/C

Alternatives and Options	Type of Crop							Total
	Blue-berries	Christ-mas Trees	Field Corn	Grapes <sup>4</sup>	Hay/Silage	Nursery Stock	Pasture	
<b>Crops not Allowed in the Right-of-Way<sup>5</sup></b>								
<b>Crossover Alternative</b>	\$0	\$0		\$0		\$0		\$0
Crossover Option 1	N/C	N/C		N/C		N/C		N/C
Crossover Option 2	N/C	N/C		N/C		N/C		N/C
Crossover Option 3	N/C	N/C		N/C		N/C		N/C
Notes:								
N/C – No net change from the action alternative								
1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.								
2. Totals may not sum due to rounding.								
3. Calculated in perpetuity.								
4. Grapes are the crop produced on land the Washington State Department of Agriculture data classifies as a vineyard.								
5. Calculated in perpetuity; field corn, hay/silage, and pasture allowed to grow in the right-of-way.								
6. Impact numbers not shown in parentheses reflect updated data, assumptions, and design refinements; impact numbers shown in parentheses reflect updated data and assumptions using the Draft EIS design.								
Sources: BPA 2015; Cross et al. 1991; Julian et al. 2011; Seavert and Horneck 2014; USDA NASS 2014a, 2014b; Washington State Department of Agriculture, 2013								

### 11.2.4.3 Private and Non-WDNR Public Timber Production

Construction of the West Alternative would cause an increase of about \$499,592 (see Table 11-11) in the revenue derived from timber production on private and public land owned by local governments (City of Camas) by triggering harvest of existing mature timber stock on lands that would be cleared for the project. This short-term increase would be the same with West Option 1, and larger with West Options 2 and 3. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. The increase would be somewhat greater than the values calculated here if BPA needs to clear danger trees, or for temporary access roads, staging areas, helicopter fly yards, and pulling and tensioning sites. The actual increase could be greater or less than the total increase calculated here, depending on how actual conditions on the ground deviate from average and assumed conditions (see Section 11.2.2.7, Private and Non-WDNR Public Timber Production, for assumptions).

Over the life of the project, the West Alternative would cause a long-term decrease in revenue, with a net present value of about \$1.4million (see Table 11-12), from timber harvests that would have occurred, but for the project, on private and City of Camas timberlands. The increase would be the same with West Option 1, and larger with West Options 2 and 3. The impact would be slightly greater than the values calculated here if BPA continues to clear danger trees, or for temporary access roads, staging areas, helicopter fly yards, and pulling and tensioning sites. The actual impact could be greater or less than the total increase calculated here, depending on how actual conditions on the ground deviate from average and assumed conditions (see Section 11.2.2.7, Private and Non-WDNR Public Timber Production, for assumptions). The decrease in timber production likely would have no impact on market prices for timber.

**Table 11-11 Value of Timber Cleared from Private and Non-WDNR Public Timberlands (in 2014 Dollars)<sup>1,2,3,4</sup>**

Alternatives and Options	Weyerhaeuser Columbia Timberlands LLC	PacifiCorp <sup>5</sup>	Sierra Pacific Industries	Weyerhaeuser Company	Other Private	City of Camas	Total
<b>West Alternative</b>	<b>\$103,397</b>	<b>N/C</b>	<b>N/C</b>	<b>\$83,871</b>	<b>\$311,382</b>	<b>\$942</b>	<b>\$499,592</b>
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	\$0
West Option 2	N/C	N/C	N/C	N/C	+\$220	N/C	+\$220
West Option 3	+\$64,565	N/C	N/C	N/C	+\$94,101	N/C	+\$158,666
<b>Central Alternative<sup>6</sup></b>	<b>\$905,339 (\$891,745)</b>	<b>\$58,454 (\$54,159)</b>	<b>\$194,381 (\$184,806)</b>	<b>\$1,097,137 (\$1,058,493)</b>	<b>\$504,170 (\$570,522)</b>	<b>\$72,787 (\$64,284)</b>	<b>\$2,832,269 (\$2,824,010)</b>
Central Option 1 <sup>6</sup>	N/C (-\$4,993)	N/C (N/C)	-\$62,850 (-\$51,524)	N/C (N/C)	N/C (+\$266)	N/C (N/C)	-\$62,850 (-\$56,252)
Central Option 2	-\$274,304	N/C	-\$184,806	-\$16,910	+\$265,433	N/C	-\$210,587
Central Option 3	+\$69,007	-\$43,934	N/C	-\$312,998	-\$48,577	N/C	-\$336,502
<b>East Alternative</b>	<b>\$801,692</b>	<b>\$144,037</b>	<b>\$184,806</b>	<b>\$2,011,983</b>	<b>\$300,955</b>	<b>\$137,084</b>	<b>\$3,580,557</b>
East Option 1	-\$318,675	N/C	-\$184,806	+\$86,631	+\$181,208	N/C	-\$235,643
East Option 2	-\$59,271	N/C	N/C	-\$234,303	+\$61,408	-\$72,794	-\$304,960
East Option 3	-\$34,926	N/C	N/C	N/C	N/C	-\$129,210	-\$164,135
<b>Crossover Alternative</b>	<b>\$373,628</b>	<b>\$128,200</b>	<b>N/C</b>	<b>\$832,627</b>	<b>\$502,914</b>	<b>\$137,078</b>	<b>\$1,974,447</b>
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	+\$6,157	N/C	+\$143,191	N/C	+\$3,734	N/C	+\$153,081
Crossover Option 3	+\$10,941	N/C	+\$185,509	+\$22,349	+\$44,778	N/C	+\$263,577

## Notes:

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Calculated for timber that would be cleared from the right-of-way and access roads.

3. Totals may not sum due to rounding.

4. See Section 11.2.2.7, Private Timber Production, for assumptions used to quantify these values.

5. PacifiCorp harvests timber for wildlife habitat on its mitigation lands.

6. Impact numbers not shown in parentheses reflect updated data, assumptions, and design refinements; impact numbers shown in parentheses reflect updated data and assumptions using the Draft EIS design.

Sources: BPA 2015, Clark County 2015b, Corelogic 2015, Cowlitz County 2015b, Herrera 2010, Warren 2009, WDNR 2014b

**Table 11-12 Net Present Value of Revenue from Future Timber Harvests that Would Have Occurred on Private and Non-WDNR Public Timberlands but for the Project (in 2014 dollars)<sup>1,2,3,4,5</sup>**

Alternatives and Options	Weyerhaeuser Columbia Timberlands LLC	PacifiCorp <sup>6</sup>	Sierra Pacific Industries	Weyerhaeuser Company	Other Private	City of Camas	Total
<b>West Alternative</b>	<b>\$287,213</b>	<b>N/C</b>	<b>N/C</b>	<b>\$232,976</b>	<b>\$864,950</b>	<b>\$736</b>	<b>\$1,385,875</b>
West Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
West Option 2	N/C	N/C	N/C	N/C	+\$611	N/C	+\$611
West Option 3	+\$179,348	N/C	N/C	N/C	+\$261,392	N/C	+\$440,740
<b>Central Alternative<sup>7</sup></b>	<b>\$2,514,831 (\$2,477,071)</b>	<b>\$162,372 (\$150,443)</b>	<b>\$539,948 (\$513,350)</b>	<b>\$3,047,604 (\$2,940,258)</b>	<b>\$1,400,473 (\$1,584,783)</b>	<b>\$56,866 (\$50,223)</b>	<b>\$7,722,094 (\$7,716,128)</b>
Central Option 1 <sup>7</sup>	N/C (-\$13,871)	N/C (N/C)	-\$174,582 (-\$143,123)	N/C (N/C)	N/C (+\$739)	N/C (N/C)	-\$174,582 (-\$156,255)
Central Option 2	-\$761,954	N/C	-\$513,350	-\$46,973	+\$737,314	N/C	-\$584,964
Central Option 3	+\$191,686	-\$122,040	N/C	-\$869,438	-\$134,935	N/C	-\$934,727
<b>East Alternative</b>	<b>\$2,226,923</b>	<b>\$400,103</b>	<b>\$513,350</b>	<b>\$5,588,841</b>	<b>\$835,987</b>	<b>\$107,099</b>	<b>\$9,672,304</b>
East Option 1	-\$885,209	N/C	-\$513,350	+\$240,641	+\$503,354	N/C	-\$654,564
East Option 2	-\$164,641	N/C	N/C	-\$650,843	+\$170,579	-\$56,871	-\$701,776
East Option 3	-\$97,016	N/C	N/C	N/C	N/C	-\$100,947	-\$197,963
<b>Crossover Alternative</b>	<b>\$1,037,856</b>	<b>\$356,111</b>	<b>N/C</b>	<b>\$2,312,852</b>	<b>\$1,396,985</b>	<b>\$107,094</b>	<b>\$5,210,898</b>
Crossover Option 1	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Crossover Option 2	+\$17,101	N/C	+\$397,752	N/C	+\$10,372	N/C	+\$425,225
Crossover Option 3	+\$30,391	N/C	+\$515,303	+\$62,081	+\$124,383	N/C	+\$732,158

## Notes:

N/C – No net change from the action alternative

1. The value for each option represents the net change from the action alternative. It was calculated as the total value added by the option minus the total value in the segments the option replaces.

2. Calculated for timber that would be cleared from the right-of-way and access roads.

3. Totals may not sum due to rounding.

4. See Section 11.2.2.7, Private Timber Production, for assumptions used to quantify these values.

5. Calculated in perpetuity.

6. PacifiCorp harvests timber for wildlife habitat on its mitigation lands.

7. Impact numbers not shown in parentheses reflect updated data, assumptions, and design refinements; impact numbers shown in parentheses reflect updated data and assumptions using the Draft EIS design.

Sources: BPA 2015, Clark County 2015b, Corelogic 2015, Cowlitz County 2015b, Herrera 2010, Warren 2009, WDNR 2014b

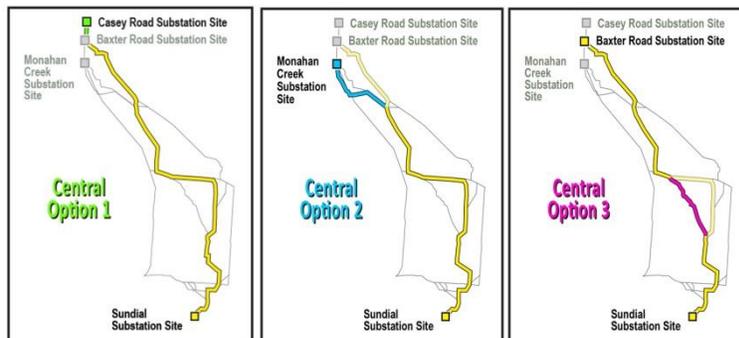
## 11.2.5 Central Alternative and Options

### 11.2.5.1 Government Revenue

The Central Alternative would affect government revenue in Washington from state trust lands and from timber-harvest taxes.

#### Washington State Trust Lands Revenue

During construction, the Central Alternative would cause an increase of about \$3,325,092 (see Table 11-5) in timber-harvest revenue from state trust lands by triggering harvest of mature timber stock on lands cleared for the project. This short-term increase in revenue represents a **small** change (about 2 percent) compared to the annual revenue from timber sales for the trusts statewide, which was \$142 million in 2014. Trees harvested on State Forest Lands Trust land would increase near-term revenue for the state, as well as Clark and Cowlitz counties, which are beneficiaries of this trust. An additional 13 acres of WDNR-managed timberland would be cut for pulling and tensioning sites, and would grow back. This could increase revenue slightly, or could have no effect if other cuts are deferred.



Larger increases during construction would occur for Central Option 1, but smaller increases for Central Option 3 (there would be no change for Central Option 2). The increase would be somewhat greater than the values calculated here if BPA needs to clear danger trees, or for temporary access roads, staging areas, helicopter fly yards, and pulling and tensioning sites. The actual increase for each individual landowner could be greater or less than the total increase calculated here, depending on how actual conditions on the ground deviate from average and assumed conditions (see Section 11.2.2.4, Government Revenue, for assumptions).

Over the life of the project, the Central Alternative would create a long-term decrease in revenue, with a net present value of about \$2,597,779 (see Table 11-6) from forgone future harvests on the cleared lands. Greater decreases would occur for Central Option 1, but smaller decreases for Central Option 3. On an annualized basis, the long-term decrease likely would be small, relative to the annual statewide timber sales for each trust. The decrease in annual revenue would have a **high** impact on Cowlitz County or Clark County if it exceeds the average annual compensation cost per one worker and triggers a reduction in workforce or infrastructure available for providing public services.

#### Tax Revenue from Private Timber Harvest

Construction of the Central Alternative would cause a short-term increase of about \$137,974 (see Table 11-7) in the timber-harvest tax revenue of affected counties and the state

government in Washington, by triggering harvest of existing mature timber stock on private lands cleared for the project. The increase would be smaller with Central Options 1, 2, and 3. The Central Alternative would cause a long-term decrease in timber-harvest tax revenue during operation, by precluding future timber production on the cleared lands, with a total net present value of about \$383,261 (see Table 11-8). The decrease would be smaller with the central options. The short-term increase and long-term decrease in timber tax revenue would represent small changes compared to the annual tax-revenue collections from harvests in Cowlitz and Clark counties. The decrease in annual revenue would have a **high** impact on Cowlitz County or Clark County if it exceeds the average annual compensation cost per one worker and triggers a reduction in workforce or infrastructure available for providing public services.

### 11.2.5.2 Agricultural Production

Construction of the Central Alternative would cause a short-term decrease in revenue of about \$2,700 by removing crops both inside and outside of the right-of-way (see Table 11-9). Some of this removal would be temporary; for example, crops removed for a temporary access road across an agricultural field needed for access to the right-of-way. The decrease would be larger with Central Options 2 and 3. This represents a tiny proportion of the annual agricultural production revenues in Cowlitz, Clark, and Multnomah counties (about 0.002 percent of the revenue generated in 2012, in 2014 dollars, a level unlikely to be discernible in the regional economy). The decrease could be a greater proportion of agricultural revenue for individual landowners.

Operation of the Central Alternative would cause a long-term decrease in revenue, with a present value of about \$334,400, by permanently eliminating landowners' ability to produce crops within the tower footprints (see Table 11-10). The decrease would be smaller with Central Option 2, but larger with Central Option 3. Landowners may not grow crops over 4 feet or crops requiring support structures within the entire right-of-way. Assuming landowners stop growing these crops in the right-of-way, the Central Option 3 would cause an additional long-term decrease in revenue, with a present value of about \$1,330,200 (see Table 11-10). There would be no impact from crops not being allowed in the right-of-way from the Central Alternative. The long-term decrease would be small, relative to the annual value of agricultural production in Cowlitz, Clark, and Multnomah counties. The decrease could be proportionally more significant for an individual landowner. The change in agricultural production likely would have no impact on regional prices for agricultural products. At the local level, impacts could be **low-to-moderate** if local prices for a particular product are affected by limited supply.

### 11.2.5.3 Private and Non-WDNR Public Timber Production

Construction of the Central Alternative would cause a short-term increase of about \$2,832,269 (see Table 11-11) in the revenue derived from timber production on private and public land owned by local governments (City of Camas) by triggering harvest of existing mature timber stock on lands that would be cleared for the project. The increase would be smaller under Central Options 1, 2, and 3. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. Over the life of the project, operation of the Central Alternative would cause a long-term decrease in revenue, with a net present value of about \$7,722,094 (see Table 11-12), from forgone future timber harvests on the cleared lands. The decrease would be smaller under Central Options 1, 2, and 3. The impact would be slightly greater than the values calculated here if BPA continues to clear danger trees, or for temporary

access roads, staging areas, helicopter fly yards, and pulling and tensioning sites. The actual impact could be greater or less than the total increase calculated here, depending on how actual conditions on the ground deviate from average and assumed conditions (see Section 11.2.2.7, Private and Non-WDNR Public Timber Production, for assumptions). The change in timber production likely would have no impact on market prices for timber.

## 11.2.6 East Alternative and Options

### 11.2.6.1 Government Revenue

The East Alternative would affect government revenue in Washington from state trust lands and from timber-harvest taxes.

#### Washington State Trust Land Revenue

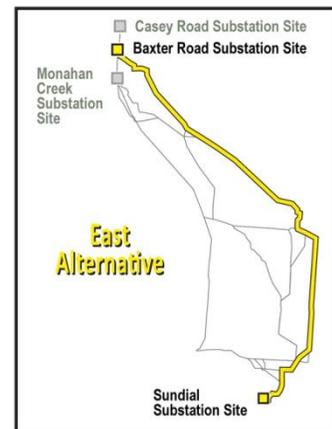
Construction of the East Alternative would cause a short-term increase of about \$1,566,043 (see Table 11-5) in timber-harvest revenue from state trust lands by triggering harvest of existing mature timber stock on lands cleared for the project. This increase in revenue represents a small change (about 1 percent), compared to the annual revenue from timber sales for the trusts statewide, which was \$142 million in 2014. Trees harvested on State Forest Lands Trust land would increase near-term revenue

for the state, as well as Clark and Cowlitz counties, which are beneficiaries of this trust.

The increase would be larger under East Options 2 and 3. Some of the increase would be offset if timberland managers

decide to reduce harvest on other lands. The increase would be somewhat greater than the values calculated here if BPA needs to clear danger trees, or for temporary access roads, staging areas, helicopter fly yards, and pulling and tensioning sites. The actual increase for each individual landowner could be greater or less than the total increase calculated here, depending on how actual conditions on the ground deviate from average and assumed conditions (see Section 11.2.2.4, Government Revenue, for assumptions).

Over the life of the project, operation of the East Alternative would cause a long-term decrease in revenue, with a net present value of about \$1,223,495 (see Table 11-6) from forgone future harvests on the cleared lands. The decrease would be larger under East Options 2 and 3. Overall, the project-related spending during construction and maintenance would have no adverse impact on tax revenue for Cowlitz, Clark, and Multnomah counties. The long-term decrease in timber-harvest tax revenue during operation may, in some years, exceed either Cowlitz or Clark county average annual compensation cost per one employee and have a **high** impact on the two counties.



## Tax Revenue from Private Timber Harvest

Construction of the East Alternative would cause a short-term increase of about \$172,174 (see Table 11-7) in the timber-harvest tax revenue of affected counties and the state government in Washington, by triggering harvest of existing mature timber stock on private lands cleared for the project. Over the life of the project, the East Alternative would cause a long-term decrease in timber-harvest tax revenue during operation, by precluding future timber production on the cleared lands, with a total net present value of about \$478,260 (see Table 11-8). Both the short-term increase and the long-term decrease would be smaller under each of the options. The short-term increase and long-term decrease in timber-tax revenue would represent small changes compared to the annual tax-revenue collections from harvests in Cowlitz and Clark counties. Overall, the project-related spending during construction and maintenance would have no adverse impact on tax revenue for Cowlitz, Clark, and Multnomah counties. The long-term decrease in timber-harvest tax revenue during operation may, in some years, exceed either Cowlitz or Clark county average annual compensation cost per one employee and have a **high** impact on the two counties.

### 11.2.6.2 Agricultural Production

Construction of the East Alternative would cause a short-term decrease in revenue of about \$22,000 by removing crops both inside and outside of the right-of-way (see Table 11-9). Some of this removal would be temporary; for example, crops removed for a temporary access road across an agricultural field needed for access to the right-of-way. The decrease would be larger with East Option 1, but the same with East Options 2 and 3. This represents a small proportion of the annual agricultural production revenues in Cowlitz, Clark, and Multnomah counties (about 0.015 percent of the revenue generated in 2012, in 2014 dollars, a level unlikely to be discernible in the regional economy). The decrease could be a greater proportion of agricultural revenue for individual landowners.

Operation of the East Alternative would cause a long-term decrease in revenue, with a present value of about \$287,200, by permanently eliminating landowners' ability to produce crops within the tower footprints (see Table 11-10). The decrease would be larger with East Option 1, and unchanged with East Options 2 and 3. Landowners may not grow crops over 4 feet or crops requiring support structures within the entire right-of-way. Assuming landowners stop growing these crops in the right-of-way, the East Option would not cause an additional long-term decrease in revenue (see Table 11-10). The long-term decrease would be small, relative to the annual value of agricultural production in Cowlitz, Clark, and Multnomah counties. The decrease could be proportionally more significant for an individual landowner. The change in agricultural production likely would have no impact on regional prices for agricultural products. At the local level, impacts could be **low-to-moderate** if local prices for a particular product are affected by limited supply.

### 11.2.6.3 Private and Non-WDNR Public Timber Production

During construction, the East Alternative would cause a short-term increase of about \$3,580,557 (see Table 11-11) in revenue derived from timber production on private and public land owned by local governments (City of Camas) by triggering harvest of existing mature timber stock on lands that would be cleared for the project. The increase would be smaller under each of the options. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands. The East Alternative would cause a long-term decrease in revenue, with a net

present value of about \$9,672,304 (see Table 11-12), from forgone future timber harvests on the cleared lands. The decrease would be smaller under each of the options. The impact would be slightly greater than the values calculated here if BPA continues to clear danger trees, or for temporary access roads, staging areas, helicopter fly yards, and pulling and tensioning sites. The actual impact could be greater or less than the total increase calculated here, depending on how actual conditions on the ground deviate from average and assumed conditions (see Section 11.2.2.7, Private and Non-WDNR Public Timber Production, for assumptions). The change in timber production likely would have no impact on market prices for timber.

## 11.2.7 Crossover Alternative and Options

### 11.2.7.1 Government Revenue

The Crossover Alternative would affect government revenue in Washington from state trust lands and from timber-harvest taxes.

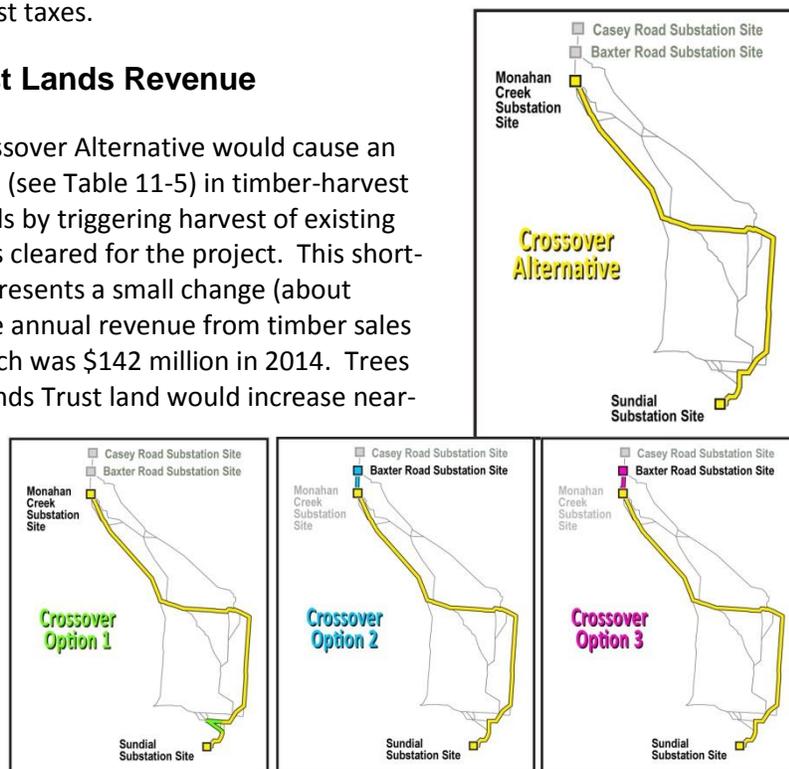
#### Washington State Trust Lands Revenue

During construction, the Crossover Alternative would cause an increase of about \$2,285,603 (see Table 11-5) in timber-harvest revenue from state trust lands by triggering harvest of existing mature timber stock on lands cleared for the project. This short-term increase in revenue represents a small change (about 1.5 percent) compared to the annual revenue from timber sales for each trust statewide, which was \$142 million in 2014. Trees harvested on State Forest Lands Trust land would increase near-term revenue for the state, as well as Clark and Cowlitz counties, which are beneficiaries of this trust.

The increase would be the same under each of the options. Some of the increase would be offset if timberland managers decide to reduce harvest

on other lands. The increase would be somewhat greater than the values calculated here if BPA needs to clear danger trees, or for temporary access roads, staging areas, helicopter fly yards, and pulling and tensioning sites. The actual increase for each individual landowner could be greater or less than the total increase calculated here, depending on how actual conditions on the ground deviate from average and assumed conditions (see Section 11.2.2.4, Government Revenue, for assumptions).

Over the life of the project, the Crossover Alternative would cause a decrease in revenue, with a net present value of about \$1,785,662 (see Table 11-6) from forgone future harvests on the cleared lands. This long-term decrease would be the same under each of the options. On an annualized basis, the long-term decrease likely would be small, relative to the annual statewide timber sales for each trust.



Overall, the project-related spending during construction and maintenance would have no adverse impact on tax revenue for Cowlitz, Clark, and Multnomah counties. The long-term decrease in timber-harvest tax revenue during operation may, in some years, exceed either Cowlitz or Clark county average annual compensation cost per one employee and have a **high** impact on the two counties.

### **Tax Revenue from Private Timber Harvest**

During construction, the Crossover Alternative would cause an increase of about \$91,868 (see Table 11-7) in the timber-harvest tax revenue of affected counties and the state government in Washington, by triggering harvest of existing mature timber stock on private lands cleared for the project. The Crossover Alternative would cause a long-term decrease in timber-harvest tax revenue during operation, by precluding future timber production on the cleared lands, with a total net present value of about \$255,190 (see Table 11-8). Both the short-term increase and the long-term decrease would be larger under Crossover Options 2 and 3. Increases and decreases in timber-tax revenue would represent small changes relative to annual tax revenue collections from harvests in Cowlitz and Clark counties.

Overall, the project-related spending during construction and maintenance would have no adverse impact on tax revenue for Cowlitz, Clark, and Multnomah counties. The long-term decrease in timber-harvest tax revenue during operation may, in some years, exceed either Cowlitz or Clark county average annual compensation cost per one employee and have a **high** impact on the two counties.

### **Agricultural Production**

During construction, the Crossover Alternative would cause a decrease in agriculture crop revenue of about \$26,000 by removing crops both inside and outside of the right-of-way (see Table 11-9). Some of this removal would be temporary; for example, crops removed for a temporary access road across an agricultural field needed for access to the right-of-way. The decrease would be larger with Crossover Option 1. This represents a small proportion of the annual agricultural production revenues in Cowlitz, Clark, and Multnomah counties (about 0.018 percent of the revenue generated in 2012, in 2014 dollars, a level unlikely to be discernable in the regional economy). The decrease could be a greater proportion of agricultural revenue for individual landowners.

Over the life of the project, the Crossover Alternative would cause a decrease in revenue, with a present value of about \$110,000, by permanently eliminating landowners' ability to produce crops within the tower footprints (see Table 11-10). This long-term decrease would be larger with Crossover Option 1. Landowners may not grow crops over 4 feet or crops requiring support structures within the entire right-of-way. Assuming landowners stop growing these crops in the right-of-way, the Crossover Alternative would cause no additional long-term decrease in revenue. The long-term decrease would be small, relative to the annual value of agricultural production in Cowlitz, Clark, and Multnomah counties. The decrease could be proportionally more significant for an individual landowner, although landowners who grow new crops less than 4 feet high can make up for a part of that revenue. The change in agricultural production likely would have no impact on regional prices for agricultural products. At the local level, impacts could be **low-to-moderate** if local prices for a particular product are affected by limited supply.

### **11.2.7.2 Private and Non-WDNR Public Timber Production**

During construction, the Crossover Alternative would cause an increase of about \$1,974,447 (see Table 11-11) in the revenue derived from timber production on private and public land owned by local governments (City of Camas) by triggering harvest of existing mature timber stock on lands cleared for the project. The increase would be larger under Crossover Options 2 and 3. Some of the increase would be offset if timberland managers decide to reduce harvest on other lands in response to project-induced timber harvest. The increase for each individual landowner could be greater or less than the total increase.

Over the life of the project, the Crossover Alternative would cause a long-term decrease in revenue, with a present value of about \$5,210,898 (see Table 11-12), from forgone future timber harvests on the cleared lands. The decrease would be larger under Crossover Options 2 and 3. The impact would be slightly greater than the values calculated here if BPA continues to clear danger trees, or for temporary access roads, staging areas, helicopter fly yards, and pulling and tensioning sites. The actual impact could be greater or less than the total increase calculated here, depending on how actual conditions on the ground deviate from average and assumed conditions (see Section 11.2.2.7, Private and Non-WDNR Public Timber Production, for assumptions). The change in timber production likely would have no impact on market prices for timber.

### **11.2.8 Recommended Mitigation Measures**

Mitigation measures included as part of the project are identified in Table 3 2. BPA is considering the following additional mitigation measures to further reduce or eliminate adverse socioeconomic impacts by the action alternatives. If implemented, these measures would be completed before, during, or immediately after project construction unless otherwise noted.

- Where appropriate, site transmission facilities to avoid WDNR lands planned for wind farms or other income generating opportunities.
- Use the Federal Highway Administration's Temporary Waiver to address relocations where landowners may owe more money than their house is worth, and BPA requires them to sell and relocate. The purpose of the temporary waiver is to make the landowner whole so that they can move into comparable housing. The temporary waiver is in effect until December 31, 2012. BPA could make the decision to continue to use this process even if the Federal Highway Administration decides not to extend it after 2012.
- Compensate the state trusts, using the appraisal process, to establish market value for state timber trust lands within the right-of-way and for access roads. Alternately, consider purchasing and donating similar timberlands elsewhere that would provide the same unencumbered market value as the affected lands.
- Compensate owners, using the appraisal process, to establish market value for private timberlands lands within the right-of-way and for access roads. Alternately, consider purchasing and donating similar timberlands elsewhere that would provide the same unencumbered market value as the affected lands.
- Compensate owners using the appraisal process to establish market value for agricultural related lands within the right-of-way and for access roads. Alternately,

consider purchasing and donating similar agricultural lands elsewhere that would provide the same unencumbered market value as the affected lands.

- Compensate landowners using the appraisal process to establish the market value for any demonstrated increases in management costs related to the project right-of-way, substations, access roads, and other project-related factors.
- Minimize construction, operation, and maintenance activities around agricultural land or timberland during active production or harvest periods.

## 11.2.9 Unavoidable Impacts

After appropriate mitigation actions have been taken, assuming they would be implemented in full, the project could still produce several unavoidable impacts. The project could decrease human health and safety because of the risks of accidents for workers and the public. The project also could decrease the perceived value of some elements of natural and social capital that contribute to the social and economic well-being of some households, businesses, communities, or groups. If mitigation does not fully address other direct and indirect costs of the project (e.g., future earnings from displaced activities such as timber harvest or agricultural production), these unaddressed costs would become unavoidable impacts.

## 11.2.10 No Action Alternative

Without the project, the changes to revenues and expenditures, and the resulting socioeconomic impacts discussed in this chapter, would not occur. Trees inside and next to the project's right-of-way and access roads in forest lands would likely eventually be harvested, providing revenue for state trusts and private producers, and tax revenue for states and counties. Agricultural land inside and next to the project's right-of-way and access roads could eventually be developed for residential or commercial purposes, or used to grow trees or crops as they are today. New development, changes in land use, wildfire, or other natural or human-induced events may affect the views, sense of solitude, or other amenities current property owners or others within the project area enjoy. The specific timing, nature, or characteristics of these and other changes are impossible to predict.

Without the project, in the short-term, increased congestion on the region's transmission grid could directly increase the costs of using the existing transmission system (see Chapter 1, Purpose and Need). In the long-term, increased congestion would likely generate direct and indirect costs to electricity consumers by reducing transmission-system reliability in parts of Washington and Oregon. The costs of electricity outages to residential, commercial, and industrial customers are described in Section 11.1.8.5, Transmission System Reliability. Reduced reliability could contribute to some firms' decisions to relocate from Washington and Oregon to other states, resulting in fewer employment opportunities and reduced income for workers in Washington and Oregon. It also could cause companies that may be considering investing or locating in the region to make investments elsewhere, reducing the potential for long-term economic growth.

Increased incidence of brownouts could cause some residential and commercial property owners to invest in back-up electricity generators, incurring costs they otherwise would avoid. These investments, however, could increase the employment opportunities and incomes for workers and business owners who specialize in the sale and installation of such equipment, potentially offsetting some of the adverse employment-and income-related consequences of

not investing in the project. Increased frequency of major disruptions in electricity service could also increase response times and reduce the availability of law-enforcement and fire-protection services for handling routine emergencies. These effects could diminish the quality of life for residents in the region.