

3.11 ENERGY AND NATURAL RESOURCES



Energy is consumed in nearly all aspects of modern life. Energy resources in various forms (e.g., electricity, natural gas, petroleum) are used in the operation of households, businesses and industries, in construction, and for the transportation of goods and services. This chapter presents the estimated energy requirements of the proposed project and the availability of local natural resources (specifically fill material to be used to construct the facility). The use of fuel to transport crude oil to the Shell Puget Sound Refinery (PSR) is discussed, along with the associated changes in fuel consumption from shipment of crude by rail. The environmental impacts of energy use – specifically air quality and greenhouse gas emissions – are described in Chapter 3.10 – Air Quality and Greenhouse Gases.

STUDY AREA AND METHODOLOGY

The study area used to analyze impacts to energy and natural resources included the proposed project site at the Shell Puget Sound Refinery (PSR), the wetland mitigation site, and the areas that comprise the proposed unit train routes, both within Washington State and from the mid-continent region to the Shell PSR. Because energy supplies are provided at a regional scale, the cumulative impacts study area includes western Washington State.

Information was obtained on existing energy supplies and use from local electric and natural gas utilities (see Chapter 3.12 – Land Use and Social Elements). Estimates of construction energy consumption were based on the scope of proposed construction activities (at both the project and wetland mitigation sites) and, in particular, the estimated number of truck trips to transport materials to and from those sites. Operational impacts were assessed by determining the change in energy use between what would be required for the proposed project compared with current energy consumption. The analysis also determined energy use that would be required to transport crude oil by rail from the mid-continent area to the Shell PSR. Those results were compared qualitatively to energy use to transport crude oil to the Shell PSR by marine vessels from Alaska. These analyses estimated use of diesel fuel for construction and operational impacts because diesel is the primary fuel source used for proposed activities. A qualitative analysis was also conducted to determine whether the proposed project would impede development of solar or other renewable energy technologies on adjacent properties.

Select laws, regulations, and guidance applicable to energy and natural resources associated with the proposed project are summarized in Table 3.11-1.

Table 3.11-1 Laws, Regulations, and Guidance for Project-Related Energy and Natural Resources

Laws, Regulations, and Guidance	Description
Federal	
Clean Air Act of 1963 (42 USC 7401) as amended	The comprehensive federal law that regulates air emissions from stationary and mobile sources and defines U.S. Environmental Protection Agency (USEPA) responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. In 2007, the U.S. Supreme Court ruled that greenhouse gases are air pollutants under the Clean Air Act.
State	
State Environmental Policy Act (SEPA) (RCW 43.21c; WAC 197-11)	Helps state and local agencies in Washington identify possible environmental impacts that could result from a proposed action, alternatives to the proposed action, and potential impact minimization and mitigation measures. Information learned through the review process can be used to change a proposal to reduce likely impacts and inform permitting decisions at the state and local levels.

Potential impacts on depletable natural resources were based on estimates of material that would be excavated and used for fill in constructing the project. This assessment assumed that construction materials like soil, gravel, and concrete would be from local sources to the extent possible and that quantities of fill material required by the project would be from Skagit County sources.



AFFECTED ENVIRONMENT

Proposed Project Site

The Shell PSR uses electrical power supplied by Puget Sound Energy (PSE). Cascade Natural Gas provides the facility with natural gas.

Currently, the Shell PSR receives about 75 percent of its crude oil from the Alaska North Slope via marine vessel. About 25 percent of its crude oil is delivered from Canada via the Kinder Morgan Puget Sound pipeline. Presently no crude oil is transported to the Shell PSR by rail, and there are no facilities in place to receive crude oil by rail.

No solar energy or other renewable energy generation facilities operate on properties adjacent to the proposed project site.

Wetland Mitigation Site

Existing activities at the wetland mitigation site include operation of pumps (AECOM 2016) and limited vehicle access, so energy use at the site is very low.

Extended Study Area

Diesel fuel is used to power train locomotives operating on the Anacortes Subdivision, Bellingham Subdivision, and BNSF Railway main line that transport large quantities of commodities, raw materials, and other goods. Presently, approximately 21 one-way trains carrying a variety of cargoes travel north or south along the Bellingham Subdivision through Burlington each day. Approximately two BNSF Railway trains travel daily on the Anacortes Subdivision to serve the Shell PSR, the adjacent Tesoro Anacortes Refinery, and other neighboring industries. Transportation use of diesel fuel in Washington (by all modes, e.g., highway, rail) is about 18.5 million barrels, or about 775 million gallons annually (EIA 2016).

ENVIRONMENTAL IMPACTS

No Action Alternative

Because no construction or operation would take place under the no action alternative, there would be no impacts to energy and natural resources. Transport of crude oil would continue by current methods and no fuel or other energy would be used to construct the proposed project. If the Shell PSR were to obtain additional crude from other sources in the future (e.g., marine vessel shipments from the Alaska North Slope or other West Coast ports), diesel fuel would be used to transport that crude oil and energy consumption could change. Oil supplies for the refinery would continue to be delivered using existing available delivery methods.

Why are alternatives to fossil fuels not considered in this EIS?

During the public scoping process, several commenters requested an evaluation of alternative energy sources and support for a move away from fossil fuel dependency. As described in Chapters 1 and 2, this EIS evaluates potential effects of the no action alternative and the proposed project. Neither of these alternatives involves changes to regional or national consumption of fossil fuels, or an increase in fossil fuel production. Therefore, this EIS does not evaluate alternative energy resources.



Proposed Project Site

Direct Impacts

Construction

The proposed project would require fuel consumption for construction activities and to transport materials, equipment, and workers to the project site. Activities would include site preparation, construction of the rail unloading facility and associated infrastructure, and construction of a new railroad spur off the Anacortes Subdivision onto the Shell PSR property. These activities are anticipated to take about two years to complete and would require up to 200 workers at the peak of construction.

Dump trucks, earth moving equipment, cranes, concrete mixers, and generators, which generally run on diesel fuel, would be required during construction. As described in Chapter 2 – Proposed Project and Alternatives, approximately 55,000 truck trips are anticipated to move excavated material to and from the proposed project site. An additional 8,750 truck trips would be required to import fill materials to the site. Operation of diesel-powered equipment and trucks would consume about 161,000 gallons of fuel. The scope of construction at the project site is similar to typical large projects in Skagit County and Washington State (see Table 3.0-1 in Chapter 3.0 – Introduction, for a list of past, present, and reasonably foreseeable future projects) and would not have an adverse impact on energy supplies. Air emissions associated with project-related fuel consumption, including greenhouse gas emissions and their potential contribution to global climate change, are described in Chapter 3.10 – Air Quality and Greenhouse Gases.

About 1.1 million cubic yards (cy) of material is anticipated to be excavated from the proposed project site during construction, about 400,000 cy of that material would be hauled to the proposed wetland mitigation site. The remaining 700,000 cy would be hauled to approved disposal sites. About 175,000 cy of fill material would be imported because the soil characteristics of the project site do not meet the requirements of the facility. The construction of the project would excavate more material than it would import and would therefore not deplete fill resources in Skagit County or surrounding areas.

Operation

After the project is constructed and operating, electrical energy would be used to run the equipment associated with the rail unloading facility. The refining capacity would not be increased by the proposed project; rather, the mode of delivery of a large portion of crude oil to the Shell PSR would gradually shift from marine vessel to rail. Electricity needed for rail unloading activities would essentially replace that for marine vessel unloading. As such, changes in energy consumption from operations at the proposed project site would be minimal. The new rail unloading facility would not affect solar or other renewable energy development adjacent to the site.



Wetland Mitigation Site

Direct Impacts

Construction

Construction of the wetland mitigation site would involve clearing, grading, and filling to restore tidal estuary functions of the area. As described in Chapter 2 – Proposed Project and Alternatives, approximately 20,000 truck trips are expected to haul fill material from the Shell PSR to the wetland mitigation site over a concentrated period of approximately six months, and then periodically over a span of two years. Construction equipment and trucks would consume approximately 53,300 gallons of diesel fuel. The scope of wetland mitigation site construction is comparable to typical infrastructure projects of similar size in Skagit County and Washington State and would not have an adverse impact on energy supplies.

Operation

The wetland mitigation site would require minimal energy use, and be mainly in the form of fuel used by vehicles or equipment for monitoring and maintenance, and for the pump station (if included in final mitigation plan).

Extended Study Area

Direct Impacts

Construction

The proposed project would not involve construction in the rail corridor; therefore, there would be no impact on energy use.

Operation

Operation of the proposed project would continue to use electricity and natural gas from existing suppliers. Project operations would include, on average, six unit trains per week with up to 102 tank cars per train delivering crude oil to the Shell PSR from the mid-continent area. Fuel that would be used to transport this crude oil was estimated by reviewing average system-wide efficiency data for BNSF Railway freight trains (954 gross-ton-miles [GTM] per gallon). Average system efficiency accounts for switching and idling, as well as the higher speeds through train movements and, as such, provides a representative figure for estimating fuel use.

To transport crude oil by rail along the 649-mile route in Washington State, a 102-tank car unit train would use about 10,500 gallons of diesel fuel one way; the estimated 312 trains per year would require 3.3 million gallons. Annual fuel use for the return trip of empty tank cars through the state is estimated to be about 680,000 gallons of diesel fuel. In 2013, annual transportation use of diesel fuel was about 775 million gallons (EIA 2016); estimated fuel use would be equivalent to about 0.5 percent of the 2013 statewide consumption of diesel fuel for transportation.

Transporting crude oil by rail from the mid-continent area to the Shell PSR over a distance of about 1,449 miles and making the return trip with empty cars (including the portions of those



trips through Washington) would require approximately 9.1 million gallons of diesel fuel annually.

As a point of comparison, fuels used to transport the equivalent amount of Alaska North Slope crude oil from Valdez, Alaska to the Shell PSR and back by marine vessel (about 1,400 miles) is estimated to be about 4.8 million gallons annually. Therefore, the proposed project would result in a net increase of fuel use for transport of crude oil to the PSR; however, in the context of overall fuel use for transportation, this change would not have an adverse impact on energy supplies. Air emissions associated with project-related fuel consumption, including greenhouse gas emissions and their potential contribution to global climate change, are described in Chapter 3.10 – Air Quality and Greenhouse Gases.

Cumulative Impacts

As described above, construction and operation of the proposed project would require fuel and electricity use; however, these activities would not have an adverse impact on energy supplies. Construction and operation of all of the reasonably foreseeable future actions would have similar impacts. Together, these projects could have a cumulative impact on energy and natural resources. However, the electricity and fuel requirement for all of the projects combined is not anticipated to have an adverse impact on energy or electricity supplies.

MITIGATION MEASURES

Avoidance and Minimization

Impacts to energy and natural resources could be minimized by the implementation of the best management practices (BMPs) recommended as part of the Shoreline Substantial Development Permit. For example, construction workers would be encouraged to carpool and delivery of construction materials would be scheduled during off-peak hours to allow trucks to travel to the site with less congestion and at fuel-efficient speeds.

Mitigation

No additional mitigation measures are proposed beyond the avoidance and minimization measures that would be developed and enforced as part of the permitting process.

