



# Tacoma Liquefied Natural Gas Facility

## Summary of Final Environmental Impact Statement

May 5, 2016

### Introduction and Background

In September 2014, the City of Tacoma (City) initiated an environmental review of the Tacoma Liquefied Natural Gas (LNG) Project (referred to herein as the Project) proposed by Puget Sound Energy (PSE). The Project would be one of the nation's first marine vessel bunkering facilities, with on-site LNG liquefaction and storage (bunkering) at the Port of Tacoma. To meet natural gas demand for the LNG facility, the Project would also include the construction of two new segments of pipeline connecting the LNG facility to PSE's existing natural gas distribution system. The construction, operation, and decommissioning of the proposed Project is referred to herein as the Proposed Action.

The environmental review process, performed under the authority of Revised Code of Washington chapter 43.21C (State Environmental Policy Act [SEPA]), was triggered when PSE formally applied for a Shoreline Substantial Development Permit with the City of Tacoma (SHR2015-40000246123). Public notice of that permit application was issued on May 12, 2015, with a comment period extending through June 11, 2015.

On September 12, 2014, the City issued a SEPA Determination of Significance, indicating the City's intention to require an Environmental Impact Statement (EIS) to assess the environmental impacts of the Project at the Port of Tacoma and the surrounding area.

On September 12, 2014, the City also began a scoping process to solicit input from the public on the issues that should be addressed in the environmental review. The City accepted comments through October 13, 2014. Eight letters were received and considered, in addition to the comments of attendees of a public scoping meeting on September 24, 2014. The City issued the Final EIS (FEIS) on September 30, 2015 after consideration of comments on the DEIS and making appropriate changes. However, after the FEIS was published, it was discovered that a comment letter had inadvertently not been addressed. The FEIS was withdrawn, the comments addressed, and the document re-issued dated November 9, 2015.

An EIS is an informational and evaluative tool. It does not mandate approval or disapproval of a project, but informs the public and decision-makers of a project's potential substantial and minor adverse impacts, along with its beneficial effects to both the built and natural environment and suggests to decision-makers the means by which those impacts could be avoided or reduced through mitigation.

### Project Objectives

The primary purpose of the Project is to chill natural gas to produce 250,000 to 500,000 gallons of LNG daily for use as a fuel by Totem Ocean Trailer Express (TOTE) at its Port of Tacoma facility. TOTE is converting its marine transport vessels to burn LNG because it is a much cleaner burning fuel and will meet the North American Emissions Control Area (ECA) requirements. The ECA requirements are international standards intended to reduce ship emissions that might be harmful to people's health and the coastal environments.

In addition to use as a marine fuel, the facility will store up to 8 million gallons of LNG on site for use as a peak-day gas supply for PSE's distribution system when needed during times of high demand. Potential future uses would include shipping the LNG by truck or barge to supply other regional markets seeking a cleaner fuel source.

Alternatives evaluated by PSE included increasing interstate pipeline capacity, regional underground natural gas storage service, and an LNG peaking facility in other locations. PSE determined that the most cost effective way to meet its resource needs was a combination of additional regional underground storage, the Tacoma LNG facility, and modernizing an existing on-system, peak-day resource.

## EIS Process

After completing the scoping process, the City of Tacoma issued a Request for Proposal from consultants to complete the EIS process. The City narrowed the selection process down to three qualified teams and selected Ecology and Environment, Inc. (E & E) to assist the City in the EIS process and prepare a draft and final EIS. The EIS process included obtaining information from PSE about the proposed project. This information was independently evaluated and verified by E & E. Based on this review, the City requested additional information from PSE, and in some cases E & E collected additional information to prepare the Draft Environmental Impact Statement (DEIS). During this process, E & E was aided by Braemar Engineering (Braemar) to evaluate the engineering and design of the proposed LNG facility.

An important aspect of the process was inclusion of information from the City and Port of Tacoma's Emergency Response/ Intelligent Transportation Study. Data and information from this study helped in assessing emergency responsiveness within the Port and what mitigation measures would be appropriate.

In addition to gathering and preparing data and information for the EIS, numerous meetings and consultations were held with local and state agencies to review and verify data and gather information. Prior to publishing the DEIS, an administrative draft was prepared for internal review by the City of Tacoma, including the Fire Department, the Port of Tacoma, and other agencies with interest in the project.

## Significant Issues Considered in the Analysis

The FEIS considered the following significant issues to be resolved through environmental and permit review:

- Changes to emergency service needs at the Port of Tacoma manufacturing/industrial center;
- Potential spill of LNG and impacts on human health and safety;
- Disruption of traffic during new pipeline construction, particularly on Taylor Way;
- Effects related to seismic and other geologic hazards;
- Management of on-site subsurface contamination during construction;
- Effects on regional air quality, including greenhouse gas emissions; and
- Visual and aesthetic impact of the facility, particularly the LNG storage tank.

## Thermal Radiation and Vapor Dispersion Safety Modeling

To ensure the public's safety, quantitative modeling is required to define the extent of thermal vapor dispersion and thermal radiation exclusion zones.

For the Tacoma LNG Project, vapor dispersion analyses were conducted for credible spill scenarios, using models required by the Federal Pipeline and Hazardous Materials Safety Administration (PHMSA). The two-dimensional and three-dimensional modeling for vapor expansion and thermal radiation was conducted by Gexcon an

international firm that developed the models. To learn more about the risk of fire and explosion modeling, visit the Gexcon website at <http://www.gexcon.com/>.

For preparation of the DEIS, E & E and Braemar met with CBI to go over the 2-D model modeling results and the preliminary design and engineering for the facility. Prior to completing the FEIS, the results of the 3D FLame ACceleration Simulator (FLACS), a Computational Fluid Dynamics (CFD) modelling, also completed by Gexcon, was reviewed by E & E and Braemar. Based on these results, E & E and Braemar recommended additional mitigation to protect worker and public health and safety.

The modeling for risk of fire and explosion is covered under a Non-Disclosure Agreement and is also considered for security reasons “Critical Energy Infrastructure Information” that is not to be released to the public.

Final design and engineering, including final modeling results, will be reviewed by the Washington Utilities and Transportation Commission (WUTC) and the Tacoma Fire Department as part of the building permit stage. As indicated above, this information is bound by the Critical Energy Infrastructure Information laws. For more information on these laws, interested parties can check with the WUTC. Chapter 3.5 (Health and Safety) of the FEIS contains more information about the mechanics of thermal radiation and vapor dispersal of LNG.

## Major Conclusions

Based on the analyses presented in the FEIS, the following major conclusions have been drawn:

- The Project would allow PSE to provide new peak-day resources to its retail natural gas customers, the demand for which is expected to grow to a deficit over the next two decades. The Project would also enable TOTE vessels to meet new emissions standards detailed in the ECA. Natural gas has been identified as a key resource to implement greenhouse gas emission reductions for commercial truck, bus, rail, and marine transportation. The Proposed Action would address this need as the transportation industry and other industrial markets seek to comply with updated emissions policies and reduce operational costs.
- The Proposed Action as mitigated would have nominal adverse effects on water resources, soils and geology, vegetation, climate and air quality, health and safety, socioeconomics, and cultural resources. Impacts to these resources would be minimized because the Project footprint would be contained in previously developed areas and paved road rights-of-way and would be mitigated as described herein.
- The Proposed Action would have an unavoidable adverse impact to visual resources due to the size of the LNG storage tank. However, proposed mitigation measures would reduce the visual impacts such that they are less than significant.

The preliminary LNG design, construction, and integrity testing are compliant to 49 Code of Federal Regulations Part 193, National Fire Protection Association 59A, and United States Coast Guard regulations. However, the design should be reviewed when complete to confirm all conditions for the installation have been met.

Preliminary siting studies were performed for Tacoma LNG using basic modeling tools, Degadis for vapor dispersion, and LNG FireIII for thermal radiation. More advanced modeling is required later in detailed engineering when the facility design is further defined using CFD software. The updated CFD models should be reviewed when they are complete to confirm that all vapor dispersion and thermal radiation conditions for the installation have been met and accepted by PHMSA. As mentioned above, the modeling information specific to the Tacoma LNG Facility is subject to a Non-Disclosure Agreement.

The Project does introduce a major new risk factor into an area with one of the City’s lowest emergency response times. The City and other stakeholders have prepared a draft Emergency Response/Intelligent Transportation Systems (ER/ITS) Study that seeks to address area-wide ER/ITS improvements needed to support projects such as PSE’s. The FEIS proposes mitigation measures that would provide additional resources for the Tacoma Fire Department in the vicinity of the Project and improve response times along Taylor Way.

## Mitigation and Minimization Measures

Table 1 summarizes all recommended mitigation measures to address the Project's potential impacts. This table will be revised and updated to reflect any additional mitigation measures needed to address concerns raised in public comments and agency action on the multiple individual permits needed (see pages 15-21). Major mitigation measures discussed herein are reasonably calculated to reduce, at times eliminate, and, in several instances, enhance the beneficial impacts of the Project to the built and natural environment. The mitigation measures listed in Table 1 are both those inherent in the Project design and those developed separately from the Project design to reduce potential impacts.

Avoidance will continue to be utilized to prevent many types of impacts from occurring in the first instance, and best management practices (BMPs) will be applied to minimize impacts where appropriate. Application of all of these measures, especially during construction, would limit and, in most instances, eliminate adverse impacts that could result from the Project.

**Table 1 Mitigation Measures Addressing the Potential Impacts of the Tacoma LNG Project**

Resource	Important Topics Addressed	Summary of Mitigation and Minimization Measures	Significant and Unavoidable Adverse Impacts
<b>Section 3.1: Earth</b>			
	<ul style="list-style-type: none"> <li>• Impacts associated with seismic effects and volcanic activity</li> <li>• Potential for Project to contribute to slope instability, topographic alterations, and erosion</li> <li>• Potential for subsurface contamination to migrate from nearby sites (see also Section 3.3: Water)</li> </ul>	<ul style="list-style-type: none"> <li>• Project facilities would be sited to avoid potential geologic hazard areas, to the maximum extent practicable.</li> <li>• Due to the area’s seismic activity and high liquefaction potential, ground improvements would be required throughout the Project, particularly beneath the LNG storage tank.</li> <li>• All elements of the Project would be designed to withstand an Operational Basis Earthquake and continue functioning in its aftermath.</li> <li>• The facility would be designed to prevent catastrophic failure in the case of a Safe Shutdown Earthquake, but would not be required to remain operational in its aftermath.</li> <li>• Engineering controls would be employed to stabilize the slopes along the Hylebos and Blair shorelines, which would be unstable during a seismic event.</li> <li>• During construction and operation, the Project would maintain strict emergency response protocol to prepare for tsunami or volcanic hazards/lahar.</li> <li>• Consistent sampling of soil and groundwater throughout construction, especially near known contamination sites, would determine measures for removal of contaminated material.</li> <li>• Properly designed and constructed shoring systems would be used to prevent caving of excavation faces from temporary construction excavations.</li> <li>• Appropriate methods to remove, contain, and discharge groundwater accumulated would be used in excavations to mitigate dewatering impacts. Extracted groundwater would be handled and discharged using BMPs to prevent erosion and degradation of surface water. Groundwater extracted from known areas of contamination would be analyzed to determine treatment and disposal options.</li> <li>• Excavated soils would be used on site, to the extent practical, to reduce the volume of material exported from the site and requirements for importing material.</li> <li>• Criteria would be developed for controlling the quality of fill materials imported to the site.</li> <li>• A work plan would be prepared for actions to be taken if soil contamination is found during construction.</li> <li>• During construction, contractors would employ temporary erosion and sedimentation control measures and BMPs.</li> </ul>	<ul style="list-style-type: none"> <li>• With mitigation measures identified in the EIS, and mitigation measures inherent in Project design, the Project would have no significant unavoidable adverse impacts.</li> </ul>

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<b>Section 3.2: Air Quality</b>			
	<ul style="list-style-type: none"> <li>• Construction and operational impacts on air quality (i.e., particulates/fugitive dust and vehicle emissions)</li> <li>• Hazardous and toxic air pollutants</li> <li>• Greenhouse gas emissions</li> </ul>	<ul style="list-style-type: none"> <li>• Standard dust control measures would be applied throughout the course of construction.</li> <li>• To reduce air emissions, PSE would require contractors to implement measures to reduce emissions from vehicles and construction equipment during construction.</li> <li>• Construction equipment would be regularly maintained in accordance with manufacturer’s specification or standard practices.</li> <li>• Carpooling by construction workers would be encouraged.</li> <li>• Ultra-low sulfur diesel would be used for the emergency generator during Project operations.</li> <li>• PSE would implement a leak detection and repair program for fugitive volatile organic compound emissions.</li> </ul>	<ul style="list-style-type: none"> <li>• With mitigation measures identified in the EIS, and mitigation measures inherent in Project design, the Project would have no significant unavoidable adverse impacts.</li> </ul>
<b>Section 3.3: Water</b>			
	<ul style="list-style-type: none"> <li>• Stormwater runoff effects on water quality</li> <li>• Spread of existing contamination through groundwater during construction</li> <li>• Water quality impacts from spills during construction and operation</li> <li>• Water consumption for Project construction and operation</li> <li>• Sedimentation and erosional effects on water quality</li> </ul>	<ul style="list-style-type: none"> <li>• Wet or uncured concrete would not be allowed to enter waters of the state.</li> <li>• Excess or waste materials generated during construction would not be disposed of or allowed to enter waters of the state.</li> <li>• Land-based staging areas for activities such as storage of machinery, equipment, materials, and stockpiled soils in shoreline areas or waterward of shoreline areas would be prohibited. A silt fence would be installed around the perimeter of the upland locations where machinery, materials, and stockpiled soils are situated.</li> <li>• Any temporary soil stockpiles would be covered when not in use.</li> <li>• Work barges would not be allowed to ground on the shoreline during construction.</li> <li>• All equipment that would operate over water or below the mean high higher water mark would be cleaned of accumulated grease, oil, or mud. All leaks would be repaired prior to arriving on site. Equipment would be inspected daily for leaks, accumulations of grease, etc., and any identified problems would be fixed before operating over water or below the mean high higher water mark.</li> <li>• Vessels, construction equipment, fuel hoses, oil drums, oil or fuel transfer valves and fittings, and other equipment components would be checked regularly for drips or leaks and would be maintained and stored properly to prevent spills;</li> <li>• The contractor would have a spill kit with oil-absorbent materials on site to be used in the event of a spill or in the event that any petroleum product is</li> </ul>	<ul style="list-style-type: none"> <li>• With mitigation measures identified in the EIS, and mitigation measures inherent in Project design, the Project would have no significant unavoidable adverse impacts.</li> </ul>

**Table 1 Mitigation Measures Addressing the Potential Impacts of the Tacoma LNG Project**

Resource	Important Topics Addressed	Summary of Mitigation and Minimization Measures	Significant and Unavoidable Adverse Impacts
		<p>observed in the water.</p> <ul style="list-style-type: none"> <li>• Fueling of upland and land-based construction equipment would not occur within 100 feet of surface water.</li> <li>• The following mitigation measures would be implemented to minimize potential impacts to the Hylebos and Blair waterways:               <ul style="list-style-type: none"> <li>- Visible turbidity anywhere at or beyond the 150-foot point of compliance from activity would be considered an exceedance of the standard.</li> <li>- During demolition, including removal of existing piles in both the Hylebos and Blair waterways, containment booms would be used to surround the work areas. All accumulated debris would be collected daily and disposed of at an approved upland site.</li> <li>- A silt curtain may be installed around the pile removal area to prevent sediment from migrating beyond the existing project footprint.</li> <li>- Existing piles would either be fully extracted in a single slow and continuous motion using a vibratory hammer or cut 2 feet below the mud line should the piling break during extraction. If cut 2 feet below the mud line, the resulting holes would be filled with clean sand or other habitat mix approved by the Washington Department of Fish and Wildlife.</li> <li>- All creosote-treated wood would be contained during and after removal to preclude the entrance of sediments and any contaminated materials to the aquatic environment.</li> <li>- The work surface on the uplands or barge would include a containment basin for piles and any liquid or sediment removed during pulling of the piling.</li> <li>- Creosote-treated wood and piles from demolition of existing structures would be disposed of at an appropriate upland facility.</li> <li>- Sediments spilled on work surfaces would be contained and disposed of with the pile debris at an approved upland disposal site.</li> <li>- Hydraulic water jets would not be used to remove or place piles.</li> <li>- Spill impoundments for collection of spilled LNG, mixed-refrigerant, heavy hydrocarbons, WPG, amine, and equipment lubrication system and transformer oil design features would minimize impacts to surface water during operations.</li> <li>- Promptly remove motor oil and hydraulic fluids as a good housekeeping practice.</li> <li>- Vehicle washing and maintenance would occur offsite.</li> </ul> </li> </ul>	

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Resource	Important Topics Addressed	Summary of Mitigation and Minimization Measures	Significant and Unavoidable Adverse Impacts
		<ul style="list-style-type: none"> <li>- Contaminated groundwater encountered during construction would be contained and disposed of at an appropriate facility.</li> <li>- Regular spill prevention measures would be implemented during construction, including regular equipment inspection and maintenance. Workers would refuel vehicles and machinery 100 feet upland of surface waterbodies.</li> <li>- Marine turbidity minimization measures would be implemented during construction. The water column would be continuously monitored for turbidity discharges during and immediately after construction.</li> <li>- BMPs would be implemented during construction to manage sedimentation and erosional effects on water quality.</li> <li>- During replacement of a creosote-treated bulkhead structure with a new steel sheet pile bulkhead, the existing structure would remain in place to provide erosion and sediment control.</li> </ul>	

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Resource	Important Topics Addressed	Summary of Mitigation and Minimization Measures	Significant and Unavoidable Adverse Impacts
<b>Section 3.4: Plants and Animals</b>			
	<ul style="list-style-type: none"> <li>• Impacts to aquatic habitat</li> <li>• Impacts to marine mammals</li> <li>• Pile driving</li> <li>• Disturbance of bird species during construction</li> <li>• Loss of habitat</li> <li>• Wildlife mortality</li> <li>• Coastal and stream bank disturbances</li> <li>• Loss of riparian vegetation</li> </ul>	<ul style="list-style-type: none"> <li>• To limit the amount of noise and vibratory impacts of pile driving, pilings would be installed initially with a vibratory hammer to 90 percent-plus of their design depth (within 10 feet of design tip elevation). Impact hammering would then be employed until load-bearing or pile-tip elevation specifications have been met.</li> <li>• One or more other noise attenuation methods (e.g., wood blocks, nylon blocks) would be used during impact installation or proofing of all steel pilings.</li> <li>• Intertidal pilings would be installed during dry or shallow water tide stages to the extent practicable.</li> <li>• Trenchless technology would be used to install pipeline along existing culverts, thereby avoiding impacts to stream habitat along pipelines.</li> <li>• 532 creosote-treated timber piles would be removed from the Blair-Hylebos waterways to be replaced with 142 steel piles, improving water quality as a result.</li> <li>• Intertidal pilings would be installed during dry or shallow water tide stages, to the extent practicable.</li> <li>• Pile removal and installation would be restricted to the in-water work window for Commencement Bay (July 16 to February 14)</li> <li>• Project-associated tugs and bunkering barges would maintain slow speeds (less than 5 miles per hour) to avoid striking marine mammals.</li> <li>• During pile-driving, a qualified observer would monitor humpback and killer whale activity. Observers would have authority to halt pile driving if humpback or killer whales are observed within distances in which behavior disturbance may occur.</li> </ul>	<ul style="list-style-type: none"> <li>• No significant, permanent, unavoidable impacts to animals are anticipated because the majority of the Project footprint would be contained in existing developed areas, largely port-industrial sites and paved road rights-of-way. Potential impacts to aquatic/marine habitat would be mitigated with proposed avoidance and minimization measures.</li> </ul>
<b>Section 3.5: Health and Safety</b>			
	<ul style="list-style-type: none"> <li>• Fire/explosion risk due to construction and/or operation of the Project</li> <li>• Risks to workers from existing on-site contamination</li> <li>• Spill potential during Project construction</li> <li>• Increased traffic accidents as a result of construction</li> </ul>	<ul style="list-style-type: none"> <li>• The LNG facility design would incorporate mitigation measures to meet the federal regulations for maximum allowable thermal radiation and vapor concentration at the PSE and TOTE property lines.</li> <li>• During LNG fueling in the Blair Waterway or barge loading activities on the Hybelos Waterway PSE should consider establishing public exclusion zones around the operating area.</li> <li>• A Contaminated Media Management Plan would be developed, outlining the proper protocol that would be implemented should contaminated media be encountered during installation of the distribution system.</li> </ul>	<ul style="list-style-type: none"> <li>• With mitigation measures identified in the EIS, and mitigation measures inherent in Project design, the Project would have no significant unavoidable adverse impacts.</li> </ul>

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Resource	Important Topics Addressed	Summary of Mitigation and Minimization Measures	Significant and Unavoidable Adverse Impacts
		<ul style="list-style-type: none"> <li>• Hazardous materials would be stored, handled, and used in accordance with best practices for storage and management of hazardous materials.</li> <li>• A construction worker health and safety plan would be implemented to address health and safety during construction.</li> <li>• A Joint Emergency Response Plan would be prepared by local first responders and facility owners/operators that would detail emergency response command system and procedures.</li> <li>• Fueling and maintenance of construction-related equipment would occur within dedicated areas equipped with spill kits.</li> <li>• PSE would strictly adhere to local jurisdictional traffic control requirements to minimize traffic impacts, which may include night-time work or reduced-duration daytime schedules to avoid rush-hour traffic.</li> <li>• The facility and equipment would be laid in such a way as to separate the public from hazardous material dispersion.</li> <li>• Fire and gas monitoring and protection systems would be installed throughout the facility.</li> <li>• The facility would be provided with an emergency shutdown system designed to leave the facility in a safe state in case of an incident.</li> </ul>	
<b>Section 3.6: Noise</b>			
	<ul style="list-style-type: none"> <li>• Noise impacts from the construction and operation of the Project</li> </ul>	<ul style="list-style-type: none"> <li>• In-water and air noise during pile driving would be minimized using a vibratory hammer, followed by limited impact hammering.</li> <li>• Sound-reducing design measures would be implemented during construction and operation</li> <li>• Haul trucks and other engine-powered equipment would be equipped with adequate mufflers.</li> <li>• PSE would establish a phone number or other effective means for the public to report significant undesirable noise conditions associated with construction and operation of the Tacoma LNG Facility.</li> <li>• Throughout Project construction and operation, PSE would document, investigate, evaluate, and attempt to resolve noise complaints related to the Project.</li> </ul>	<ul style="list-style-type: none"> <li>• With mitigation measures identified in the EIS, and mitigation measures inherent in Project design, the Project would have no significant unavoidable adverse impacts.</li> </ul>
<b>Section 3.7: Land Use and Recreation</b>			
	<ul style="list-style-type: none"> <li>• Construction-related impacts to recreational resources</li> </ul>	<ul style="list-style-type: none"> <li>• Temporary limitations on active recreational waterway uses within the Project Area would not be significant enough to require mitigation</li> </ul>	<ul style="list-style-type: none"> <li>• With mitigation measures identified in the EIS, and</li> </ul>

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	<ul style="list-style-type: none"> <li>Project's consistency with existing zoning regulations</li> </ul>	<ul style="list-style-type: none"> <li>Facilities would be landscaped to be reasonably compatible with existing development. To this end, existing vegetation bordering the site of the proposed Golden Given Limit Station should be maintained, or new, densely planted row vegetation should be placed along edges of proposed fence.</li> </ul>	<p>mitigation measures inherent in Project design, the Project would have no significant unavoidable adverse impacts.</p>
<b>Section 3.8: Aesthetics/Light, and Glare</b>			
	<ul style="list-style-type: none"> <li>Permanently changed views from residential, recreational and roadway viewpoints</li> <li>Light and glare impacts</li> </ul>	<ul style="list-style-type: none"> <li>During construction, lighting for safety and security will be shielded and oriented downward, bare bulbs will be fully screened from view from sensitive viewing receptors such as residences, and on-demand lighting and/or timers will be used to minimize visual impacts of lighting.</li> <li>It is recommended that the LNG storage tank be a non-reflective concrete finish and dark gray color.</li> <li>To minimize visual impacts and add texture and structure around the LNG storage tank, PSE would include a combination of gravel, larger boulders, and intermittent stands of drought resistant trees and shrubs. PSE would also keep this area free of invasive and noxious plants.</li> <li>To minimize impacts from street views along 11th Street and Alexander Way, to the degree possible, existing trees should be retained and additional landscaping provided.</li> <li>PSE would maintain the appearance of all construction and operation sites and would ensure that vehicles are located as inconspicuously as possible.</li> <li>To minimize nighttime visibility of lights associated with the Tacoma LNG Facility site, PSE would use minimum lighting necessary for security at construction areas, and orient lighting in a way to minimize the effects of increased light pollution.</li> <li>Exterior lighting fixtures would be attached to 30-foot-tall poles, which would be similar in height, or shorter than, most poles used for lighting in the area.</li> <li>Exterior nonpole (attached to buildings and other facilities) lighting would point downward and be shielded.</li> <li>Lighting would be located and oriented to minimize horizontal radiation or light spillover.</li> <li>Lighting would be provided with switches or automatic controls that would turn off lights when not required for operations.</li> </ul>	<ul style="list-style-type: none"> <li>Due to the size of the LNG storage tank, overall visual impact of the Project would be unavoidable, but not significant. Minimization measures in the form of aesthetic alterations would greatly reduce its visual impact.</li> <li>With implementation of design and other measures, the impacts of light and glare would not be significant or unavoidable.</li> </ul>
<b>Section 3.9: Cultural Resources</b>			
	<ul style="list-style-type: none"> <li>Impacts of construction on existing historic and cultural</li> </ul>	<ul style="list-style-type: none"> <li>PSE will prepare an Unanticipated Discovery Plan that will outline procedures in the event of an unanticipated discovery of cultural resources and human</li> </ul>	<ul style="list-style-type: none"> <li>With mitigation measures identified in the EIS, and</li> </ul>

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	resources or potential resources.	<p>skeletal remains. This would help minimize the potential for, and degree of, impacts.</p> <ul style="list-style-type: none"> <li>• Pipeline construction in areas near the base of the Blair-Hylebos peninsula at or near the natural shoreline that are deemed likely to have cultural importance would be monitored by a trained and experienced cultural resource expert.</li> <li>• PSE will provide training in identifying cultural artifacts according to a training protocol developed by PSE and approved by the City after consultation with the Puyallup Tribe.</li> <li>• If suspected cultural artifacts are found, construction will be halted in the vicinity of the find until the status of the artifact can be determined.</li> <li>• In addition, PSE will notify a contact person provided by the Puyallup Tribe prior to commencement of ground breaking and the expected duration of any excavation.</li> </ul>	mitigation measures inherent in Project design, the Project would have no significant unavoidable adverse impacts.
<b>Section 3.10: Transportation</b>			
	<ul style="list-style-type: none"> <li>• Impacts related to additional traffic trips generated by Project</li> <li>• Impacts on roadways related to construction and delivery of oversized loads</li> <li>• Impacts related to road maintenance and public access</li> <li>• Damage to roadways</li> </ul>	<ul style="list-style-type: none"> <li>• A construction traffic management plan would be developed.</li> <li>• Applicable governmental permits or approvals would be obtained.</li> <li>• Public involvement and outreach efforts would be undertaken prior to construction to help minimize access disruptions</li> <li>• Carpooling among construction workers and personnel would be encouraged to reduce traffic volume to and from the Tacoma LNG Facility site.</li> <li>• Pipeline Segment A would be constructed without disturbing rail tracks by using a horizontal drill or bore construction technique.</li> <li>• All roads and other transportation infrastructure impacted by construction would be videotaped prior to construction to document pre-construction conditions.</li> <li>• Following installation of the pipeline, roads would be restored by repaving the travel lane impacted by the pipeline construction pursuant to the appropriate plans and specifications adopted by Tacoma Public Works, City of Fife Public Works, and Pierce County Public Works.</li> <li>• To improve driving conditions on Taylor Way, from SR 509 to the project site an approach that results in rebuilding of Taylor Way to “heavy haul” standards has been agreed upon by PSE, the Port of Tacoma, and The City of Tacoma.</li> <li>• Construction of Phase I of the planned ITS Infrastructure is needed for basic information sharing among stakeholders, as defined in the ER/ITS study.</li> </ul>	<ul style="list-style-type: none"> <li>• With mitigation measures identified in the EIS, and mitigation measures inherent in Project design, the Project would have no significant unavoidable adverse impacts.</li> <li>• Construction and operation of the Project would not significantly impact maritime activity in either the Hylebos or Blair waterways.</li> </ul>

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Resource	Important Topics Addressed	Summary of Mitigation and Minimization Measures	Significant and Unavoidable Adverse Impacts
<b>Section 3.11: Public Services</b>			
<ul style="list-style-type: none"> <li>• Increase in demand for public services (police, emergency services, medical services, education)</li> <li>• Increased response time for emergency services</li> <li>• Impacts to the distribution of regional fire protection services.</li> <li>• Impacts related to wastewater and solid waste generation</li> </ul>		<ul style="list-style-type: none"> <li>• A new unit of the Tacoma Fire Department with fire response and EMS response capabilities and hazardous materials awareness could be stationed in proximity to the site of the Tacoma LNG Facility for the duration of construction.</li> <li>• PSE would provide emergency response agencies with regularly updated maps of the facilities and current access points, relevant contact information, and site procedures for fire protection and rescue operations.</li> <li>• The emergency preparedness, emergency access, and construction health and safety measures proposed by PSE and described in Section 3.5 (Health and Safety) would reduce potential impacts to fire protection and EMS throughout the construction period for the Tacoma LNG Facility and TOTE Marine Vessel LNG Fueling System.</li> <li>• Security would be provided throughout the construction period for each separate component of the Project.</li> <li>• Temporary security fencing would be erected around the construction sites to prevent trespassing and vandalism.</li> <li>• PSE or its selected contractor would notify the relevant fire department or district prior to initiating work within that department or district’s service area.</li> <li>• PSE would obtain permits before hydrostatic testing of Pipeline Segment A and Segment B begins, in accordance with the provisions of local codes for the use of fire hydrants.</li> <li>• During post-construction hydrostatic testing, the contractor would communicate with fire protection services prior to drawing water from any fire hydrant.</li> <li>• A new unit of the Tacoma Fire Department with fire response, EMS, and hazardous materials operations capabilities would be stationed in proximity to the site of the Tacoma LNG Facility.</li> <li>• PSE would provide regular orientation to the site to relevant responders at the Tacoma Fire Department, and operations personnel and the Fire Department would consult to develop and implement an ongoing training regime that integrates best practices for responding to fire and emergencies at the Tacoma LNG Facility.</li> <li>• The Tacoma LNG Facility would contain fire and hazardous gas detectors, fire-extinguishing systems, and an extensive firewater system, as well as new pier</li> </ul>	<ul style="list-style-type: none"> <li>• The Proposed Action could have significant impacts on local fire protection services. However, this would be mitigated by reintroducing a staffed fire station no later than the Project’s opening.</li> <li>• With mitigation measures identified in the EIS, and mitigation measures inherent in Project design, the Project would have no significant unavoidable adverse impacts.</li> </ul>

**Table 1 Mitigation Measures Addressing the Potential Impacts of the Tacoma LNG Project**

Resource	Important Topics Addressed	Summary of Mitigation and Minimization Measures	Significant and Unavoidable Adverse Impacts
		<p>and access trestles that would provide firetruck access to the loading platform.</p> <ul style="list-style-type: none"> <li>• The intrusion detection system would monitor the perimeter for the facility and alarm when the perimeter is disturbed.</li> <li>• Security cameras would be installed along the perimeter and other select locations for maximum viewing coverage.</li> <li>• Closed-circuit television system components would be powered by an uninterruptible power system.</li> <li>• The perimeter of the Tacoma LNG Facility and TOTE Marine Vessel LNG Fueling System sites would be enclosed by a chain-link security fence to ensure public safety, welfare, and site security.</li> <li>• Phase I of the Intelligent Transportation System study would be implemented.</li> <li>• PSE would implement measures to plan for and minimize emergencies, such as LNG and facility-specific safety and emergency response training to raise the level of preparedness in case of an emergency.</li> <li>• Security measures would be implemented during construction and operation, including policies for security procedures, protective enclosures, security communications, security monitoring, and warning signs.</li> <li>• New firefighting, emergency medical services, and hazardous material capacity would be added in the vicinity of the Project.</li> </ul>	
<b>Section 3.12: Socioeconomics</b>			
	<ul style="list-style-type: none"> <li>• Increases in population growth</li> <li>• Increases in employment opportunities and wage/payroll impacts</li> <li>• Long-term positive revenue growth with some potential for short-term reduction in state equality payment for schools</li> </ul>	<ul style="list-style-type: none"> <li>• No mitigation measures are required or proposed because there are no negative socioeconomic impacts associated with the proposed Action.</li> </ul>	<ul style="list-style-type: none"> <li>• The Project would have no significant or unavoidable adverse impacts.</li> </ul>

## Permitting Assessment

Combined, the following tables make up a list of the permits and approvals anticipated to be required for the Tacoma LNG Project.

Federal Agency	Permit/Approvals	Agency Action	Agency Contact
<b><i>U.S. Department of Transportation (DOT) as Administered by WUTC Office of Pipeline Safety</i></b>	WUTC issues agency approval of design elements consistent with 49 CFR Parts 192 and 193, the federal safety standards	<p>Must demonstrate that new LNG facility meets standards governing siting, design, installation, personnel qualifications and training. Incorporates requirements of NFPA 59A.</p> <p>Through partnership, DOT/PHMSA and WUTC OPS oversee pipelines and LNG facilities in Washington State.</p>	Joe Subsits, WUTC Chief Engineer, Public Safety  Tel: 360-664-1322 Email: jsubsits@utc.wa.gov
<b><i>U.S. Department of the Army Corps of Engineers, Seattle District (USACE)</i></b>	Section 10 (Rivers and Harbors Act) Likely NEPA Lead	Permit for placement of structures in, or affecting, navigable waters (e.g., LNG loading facility).	Tom Bloxton, Project Manager Regulatory Branch  Tel: (206) 764-3443 Email: thomas.d.bloxton@usace.army.mil
	Section 404 (Clean Water Act) Individual Permit or Programmatic Nationwide Permit	In-water work at the pier/LNG loading facility.	
	Section 106 NHPA Consultation	The USACE is the federal agency responsible for conducting Section 106 Consultation with DAHP and applicable tribes (Puyallup Tribe of Indians and the Muckleshoot Tribe). In support of this consultation, PSE would prepare a cultural resources report conformant with Section 106 consultation documentation guidelines established by DAHP.	

Federal Agency	Permit/Approvals	Agency Action	Agency Contact
<b>U.S. Coast Guard (USCG)</b>	Letter of Intent (33 CFR Part 127)	Captain of the Port issues Letter of Recommendation to operator and develops operation plans (OPLAN) at sea ports.	Commander Coast Guard Sector Puget Sound Waterways Management Branch 1519 Alaska Way South Seattle, WA 98134-1102 sectorpugetsound@uscg.mil <a href="http://www.uscg.mil/d13/sectpugetsound/">http://www.uscg.mil/d13/sectpugetsound/</a> General number 206-217-6200
	Waterway Suitability Analysis (NVIC 01-2011)	Addresses requirements of 33 CFR Part 127: Coast Guard assessment of LNG Marine Operations	
	Permission to establish Aids to Navigation required under 33 CFR Part 66	USCG must be notified and give permission to establish any navigational aids (buoys) associated with the LNG loading facility.	Timothy Westcott 13 <sup>th</sup> Coast Guard District Attn: PATON Manager  Tel: (206) 220-7285 Email: <a href="mailto:Timothy.l.westcott@uscg.army.mil">Timothy.l.westcott@uscg.army.mil</a>
<b>National Marine Fisheries Service (NOAA Fisheries)</b>	Section 7 of Endangered Species Act	Provide biological concurrence on marine species of wildlife that are federally listed as threatened or endangered, and on managed fisheries. Oversight of activities associated with marine facilities construction and essential fish habitat (EFH). Underwater noise could trigger consultation due to potential impacts to listed species of salmon.	Shandra O’Haleck, NOAA shandra_ohaleck@fws.gov  Tel: 360-753-9533 Email: shandra_ohaleck@fws.gov
	Essential Fish Habitat (EFH), Magnuson-Stevens Fishery Management and Conservation Act	Underwater noise associated with pile driving.	

Federal Agency	Permit/Approvals	Agency Action	Agency Contact
	Marine Mammal Protection Act. Level B harassment authorization	Underwater noise associated with pile driving.	

Special Purpose District	Permit/Approvals	Agency Action	Agency Contact
<i>Port of Tacoma</i>	Tenant Improvement Procedure	Port of Tacoma review of tenant-proposed improvements at the leased site. The procedure defines the requirements to be adhered to by the tenant and Port staff with the intent to set review and approval standards, clarify decision making, ensure required deliverables are met and allow for a more efficient and cost-effective project completion.	Tony Warfield Sr. Project Manager, Environmental Port of Tacoma  Tel: 253-428-8632

State Agency	Permit/Approvals	Agency Action	Agency Contact
<b>Department of Fish and Wildlife (DFW)</b>	Hydraulic Project Approval	Permit for work that uses, diverts, obstructs, or changes the natural flow or bed of any of the salt or fresh waters of the state.	<p>APPS Help Hotline (<i>for permitting questions</i>)                      Tel: 360-902-2422                      Email: <a href="mailto:HPAapplications@dfw.wa.gov">HPAapplications@dfw.wa.gov</a></p> <p>Matthew Curtis                      Habitat Biologist (<i>issue permit</i>)                      Tel: 360-902-2578                      Email: Matthew.Curtis@dfw.wa.gov</p>
<b>Washington State Department of Transportation (WSDOT)</b>	State Highway Crossing Permit State Route (SR) 509, SR-99 (Pacific Highway East)	Permit for the occupancy of highway rights- of-way. Generally no concerns based on conceptual design – depending on how construction is done. 60-90 day permit timeline once plans are submitted.	<p>Pete Townsend                      Olympic Region Utilities Lead Engineer</p> <p>Tel: 360-570-6743                      Email: townsep@wsdot.wa.gov</p>
<b>Department of Archaeology and Historic Preservation</b>	Section 106 Consultation in coordination with lead federal agency	See Section 106 review entry above. The DAHP would consult directly with the USACE.	
<b>Department of Archaeology and Historic Preservation (DAHP)</b>	SEPA Review	Although not a permit or approval specifically, DAHP is designated as the agency with expertise under SEPA for cultural resource issues.	<p>Gretchen Kaehler                      Local Government Archaeologist</p> <p>Email: <a href="mailto:Gretchen.Kaehler@dahp.wa.gov">Gretchen.Kaehler@dahp.wa.gov</a>                      (360)586-3088                      (360)628-2755 (cell)</p>
<b>Department of Ecology (Ecology)</b>	401 Water Quality Certification	Certification to conduct any activity that requires excavation in or might result in a discharge of dredge or fill material into water or non-isolated wetlands.	<p>Kerry Carroll                      Shoreline and Environmental Assistance Project Manager</p> <p>Tel: 206-407-7503                      Email: Kerry.Carroll@ecy.wa.gov</p>

State Agency	Permit/Approvals	Agency Action	Agency Contact
	Spill Prevention and Spill Response Plan (CWA, 33 U.S.C.§1321(j))	Plan for responding to spills.	Jim Hogan Puget Sound Energy Project Manager  Tel: 425-462-3957
	Hazardous Chemical Inventory Reporting Requirements	Facilities that have hazardous substances on-site are required to provide information on the type, quantities, and storage locations for those substances.	
	National Pollutant Discharge Elimination System (NPDES) – Construction Stormwater General Permit	Permit for all soil-disturbing activities where one or more acres will be disturbed and have a discharge of stormwater to a receiving water and/or storm drains that discharge to a receiving water.	Carol Serdar Water Quality Project Manager  Tel: 360-407-6269 Email: carol.serdar@ecy.wa.gov
	NPDES Industrial Stormwater General Permit	Permit for public or private operation of an industrial facility with a stormwater discharge to surface waters or a storm sewer.	<i>Contact information will be released when permit applications is submitted.</i>
	Coastal Zone Consistency Determination	Determination for federal activity and development in coastal counties. Federal – State partnership: Ecology reviews projects to determine that the activities are compliant with six laws: Shoreline Management Act, SEPA, Clean Water Act, Clean Air Act, EFSEC, and Ocean Resource Management Act.	Kerry Carroll Shoreline and Environmental Assistance Project Manager  Tel: 206-407-7503 Email: Kerry.Carroll@ecy.wa.gov

Local Government	Permit/Approvals	Agency Action	Government Contact
<b>City of Tacoma</b>	SEPA Lead Agency	Environmental Impact Statement	Shirley Schultz City of Tacoma Planning and Development Services Department  747 Market St., Room 345 Tacoma, WA 98402  <i>Tel:</i> 253.573.2748 <i>Fax:</i> 206.591.5433 <i>Email:</i> <a href="mailto:shirley.schultz@ci.tacoma.wa.us">shirley.schultz@ci.tacoma.wa.us</a>
	Shoreline Substantial Development Permit	Permit issued by local government for development on shorelines at the Tacoma LNG Facility Site and TOTE Fueling Site.	
	FWHCA Permit	Wetlands and Critical Areas Review	
	Floodplain Development Permit	Local governments participating in the National Flood Insurance Program are required to review proposed development projects to determine if floodplains are shown on the NFIP maps. If a project is located in a mapped floodplain, the local government must require that a permit be obtained prior to development.	
	Clear and Grade Permit/Demolition Permit	Allows for site clearing and demolition of existing structures in compliance with local, state and federal regulations at the Facility.	
	Building Permit	Ensure LNG facility and TOTE fueling site comply with adopted building and fire codes.	
	Street Use or Right-of-Way Use Permit	Locating a pipeline or project element in road right-of-way.	
<b>Pierce County</b>	Street use or Right-of-Way Use Permit	Allows for site clearing and demolition of existing structures in compliance with local, state and federal regulations.	Marcia Lucero Pierce County Planning Project Manager  Tel: 253-798-2789 Email: <a href="mailto:mlucero@co.pierce.wa.us">mlucero@co.pierce.wa.us</a>
	Conditional Use Permit	Locating limit station in a zone not outright permitted but allowed as a conditional use in the underlying zone. Required for the new limit station.	

Local Government	Permit/Approvals	Agency Action	Government Contact
	Construction (Clear & Grade) Permit	Allows for site clearing and demolition of existing structures in compliance with local, state and federal regulations at the limit station and modifications at the existing Frederickson Gate Station.	
	Building Permit	Ensure project complies with International Building Code (IBC) and Pierce County and state policies and regulations at the proposed limit station and modifications to the Frederickson Gate Station. 17C.20 International Building Code. 17C.60 International Fire Code.	
	Critical Areas Review	Conducting activities within a critical area.	
<i>City of Fife</i>	Right of Way permit Utility permit	Locating a pipeline or project element in road right-of-way.	Steve Friddle Community Development Director City of Fife  Tel: 253-896-8633 sfriddle@cityoffife.org
	Flood permit	For activities proposed to be conducted within the 100-year floodplain.	
	Critical Areas Review	Conducting activities within a critical area.	