

# Notice of Construction (NOC) Worksheet for NOC No 11386

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# Notice of Construction (NOC) Worksheet



<b>Applicant:</b> Puget Sound Energy	<b>NOC Number:</b> 11386
<b>Project Location:</b> 1001 E Alexander Ave. Tacoma WA 98421	<b>Registration Number:</b> 30022
<b>Applicant Name and Phone:</b> Keith Faretra, (425) 456-2688	<b>NAICS:</b> 221210
<b>Engineer:</b> Ralph Munoz	<b>Inspector:</b> Wellington Troncoso

## A. DESCRIPTION

### For the Order of Approval:

One liquefied natural gas (LNG) processing facility and Totem Ocean Trailer Express (TOTE) Marine Vessel LNG fueling system. The LNG processing facility includes the use of the following equipment: one 66 MMBtu/hr LNG vaporizer, enclosed ground flare with four burners, one 9 MMBtu/hr water propylene glycol pretreatment heaters, one 1.6 MMBtu/hr regeneration pretreatment heaters, and one 8 Million gallon LNG storage tank.

### Additional Information

**Facility:** Puget Sound Energy (PSE) LNG facility is being built to provide natural gas to sources around the Tacoma area. The LNG plant plans to supply natural gas during times of peak demand, if necessary, and during non-peak times the plant liquefies natural gas for storage. PSE will use the stored LNG to provide fuel to local businesses, including TOTE (Totem Ocean Trailer Express), a local shipping company operating cargo ships between Tacoma and Alaska.

PSE's application included the following equipment:

**Emission Unit – Fugitive Pipe Leaks:**

Process fugitive VOC emissions can occur from leaks in valves, pump seals, flanges, connectors, and compressor seals. All the proposed pumps used by PSE with the exception of the heavy hydrocarbon liquid pump, will be submerged inside enclosed liquid storage tanks. There is also a seal leak recovery system for the refrigerant compressor that captures 90 percent of the leak losses, with the remaining 10 percent sent to the flare. The leaks from the feed gas compressor seals would also be captured and vented to the flare. The compressor seals for mixed refrigerant storage, the regeneration pretreatment system, and the boil off gas would have fugitive emissions vented to the atmosphere. In addition, there are several valves, relief valves, and flanged connectors for conveyance of various process fluids that have the potential for fugitive leaks. LNG bunkering of ships at the TOTE terminal would not produce any fugitive emissions. However, there are 4 swivel joints that have seals with the potential to leak LNG. The leak rate of a swivel joint is assumed to be equal to that of a pump seal for the purposes of emission calculations. Component count considered “in fluid service” were provided in the application.

**Component Counts**

Component	Phase	Fluid Served								
		Acid gas	Boil-Off Gas	Ethylene	Fuel Gas	Hydrocarbon Liquid	Liquefied Natural Gas	Mixed Refrigerant	Natural Gas	Natural Gas
Valves	Gas/Vapor	39	9	12	36			112	185	30
	Light Liquid					33	244			
Pump Seals	Light Liquid					1				
Flanges/Connectors	Gas/Vapor	0	7	2	15			28	77	15
	Light Liquid					6	114			
Compressor Seals	Gas/Vapor	0	2	0	0	0	0	1	1	0
Relief Valves	Gas/Vapor	3	0	1	3	1	19	8	9	2
Swivel Joints	Light Liquid						4			

Fugitive emission calculations used emission factors for “terminal/Depot” emission sources from South Coast Air Quality Management District’s guidelines for (SCAQMD 2003). In this document, emission factors are higher for light liquid service than for heavy liquid service; therefore, the hydrocarbon liquid and LNG fluids are conservatively estimated to be in light liquid service. As discussed in the BACT section of this worksheet, PSE will implement a leak detection and repair program to make sure leaks from these sources are at a minimum. A conservative estimate of control from the LDAR was used from the Texas Commission for Environmental Quality (TCEQ) 28M LDAR, which states 75% control for valves, pumps, compressors, and relief valves, and 30% for flanges for both gas and light liquid service. These values are lower than EPA values used in other projects (88% for light liquid service, and 92% for gas service).

Neither methane nor ethane (components of LNG) are considered VOCs at the federal level or in Washington, but to be conservative, it is assumed that 100% of the leak emissions would be VOCs. Also it is assumed that the entire benzene, toluene, ethylbenzene, and xylenes concentration in the natural gas feed is present in every fluid service by all the listed equipment.