

**PERMIT APPLICATION REVIEW  
COVERED SOURCE PERMIT NO. 0066-03-C  
Application for Minor Modification No. 0066-05**

**Applicant:** Tesoro Hawaii Corporation  
**Facility:** Hilo Terminal No. 3  
**Located At:** 607 Kalaniana'ole Avenue Hilo, Hawaii

**\*Mailing  
Address:** 431 Kuwili Street, 2<sup>nd</sup> Floor  
Honolulu, Hawaii 96817

**Coordinates:** UTM: 284239 meters East and 2182881 meters North (load rack)

- Equipment:**
- 1) 10,000 barrel internal floating roof storage Tank No. 4279 with primary and secondary wiper seals.
  - 2) 40,000 barrel internal floating roof storage Tank No. 4298 with mechanical shoe primary seal and secondary wiper seal.
  - 3) Bottom loading load rack with two (2) Loading Stations and one (1) 800 gallon per minute capacity load arm.
  - 4) John Zink vapor collection system with 3,600 gallon per minute vapor recovery unit, model no. MR-2x184DT, job no. 99145.

**Responsible  
Official:** Mr. Wade K. Nakashima  
**Title:** Manager, Supply and Distribution Hawaii  
**Phone:** (808) 547-3830  
**Address:** \*See Above

<b>Contact:</b> Mr. Jack Clayton	<b>Contact:</b> Ms. Rose Chu
<b>Title:</b> Hilo Terminal Supervisor	<b>Title:</b> Environmental Compliance Administrator
<b>Phone:</b> (808) 961-3177	<b>Phone:</b> (808) 547-3817
<b>Address:</b> 607 Kalaniana'ole Avenue Hilo, Hawaii 96720	<b>Address:</b> *See Above

**1. Background.**

1.1 Tesoro Hawaii Corporation has submitted an application for a minor modification to their covered source permit to change the seal system in Tank No. 4298 because the primary foam log seal for this tank was found during an inspection to be damaged . For the modification, the existing primary foam log seal is being replaced with a mechanical shoe primary seal and secondary wiper seal. Hilo Terminal No. 3 currently distributes only naphtha (straight run gasoline) from its tank truck load rack. The loading rack is equipped with a vapor recovery system to control volatile organic compounds (VOCs). The loading rack has two loading lanes and one load arm that swivels from one lane to the other. An old fuel oil loading rack at this site has been dismantled. Hilo Terminal No. 3 supplies naphtha to Hamakua Energy Partners, L.P. to power their combustion turbine generators. The standard industrial classification code for this facility is 5171 (Petroleum Bulk Stations and Terminals).

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1.2 Tesoro requested that this terminal be designated Hilo Terminal No. 3 instead of Hilo Terminal No. 2. Tesoro owns three distribution facilities in the same vicinity that are described as follows:

- a) Hilo Terminal No. 3 at 607 Kalaniana'ole Avenue is currently in operation under CSP No. 0066-03-C. Tesoro bought an old Tosco terminal at this site and renovate the terminal to distribute naphtha. The Tosco terminal was permitted under NSP No. 0075-01-N which has been closed.
- b) Hilo Terminal No. 2 at 595 Kalaniana'ole Avenue is not in operation. Tesoro was going to modify this terminal to build the terminal in (a) above, but decided to renovate the old Tosco terminal instead. Hilo Petroleum Terminal No. 2 is currently not in operation. The terminal was permitted under NSP No. 0066-01-N which has been closed.
- c) Hilo Terminal No. 1 at 701 Kalaniana'ole Avenue handles jet and diesel fuel. This terminal is exempt from permit requirements because the terminal handles only low vapor pressure fuels (jet fuel and fuel oil). The exemption for this terminal was granted by the Clean Air Branch (CAB) in 1997.

1.3 Permitted Tanks at the facility are listed as follows:

Tank No.	Capacity (gallons)	Capacity (barrels)	Type
4279	420,000	10,000	internal floating roof
4298	1,680,000	40,000	internal floating roof

1.4 There are five tanks that are out of service that are listed as follows:

Tank No.	Capacity (gallons)	Capacity (barrels)	Type
2727	390,600	9,300	vertical fixed roof
3119	42,000	1,000	vertical fixed roof
3708	420,000	10,000	vertical fixed roof
3738	1,050,000	25,000	vertical fixed roof
4299	159,600	3,800	vertical fixed roof

1.5 A site inspection of Tesoro Terminal No. 3 was conducted on February 23, 2006. Pictures of the inspection are shown in Enclosure (1).

**2. Applicable Requirements**

2.1 Hawaii Administrative Rules (HAR)

- Chapter 11-59, Ambient Air Quality Standards
- Chapter 11-60.1, Air Pollution Control
  - Subchapter 1, General Requirements
  - Subchapter 2, General Prohibitions
    - §11-60.1-31 Applicability
    - §11-60.1-31 Storage of Volatile Organic Compounds
    - §11-60.1-41 Pump and Compressor Requirements
  - Subchapter 5, Covered Sources
  - Subchapter 6, Fees for Covered Sources, Noncovered Sources, and Agricultural Burning
    - §11-60.1-111 Definitions
    - §11-60.1-112 General Fee Provisions for Covered Sources
    - §11-60.1-113 Application Fees for Covered Sources
    - §11-60.1-114 Annual Fees for Covered Sources
    - §11-60.1-115 Basis of Annual Fees for Covered Sources
  - Subchapter 8, New Source Performance Standards
    - §11-60.1-161 New Source Performance Standards

2.2 Tank Nos. 4279 and 4298 are subject to 40 Code of Federal Regulations (CFR), Part 60 – New Source Performance Standards (NSPS, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984. Because the tanks were reconstructed after 1984, are greater than 151 m<sup>3</sup> (greater than 40,000 gallons), and will be storing naphtha (whole straight run gasoline) with a true vapor pressure greater than 0.507 psi, Subpart Kb is applicable. Per AP-42, Section 7.1 (9/97), the true vapor pressure of gasoline with Reid vapor pressure of 10, representative of naphtha, is 7.4 psi at 80 °F. Tank Nos. 4279 and 4298 are tanks that were reconstructed from existing tanks when Tesoro modified an existing Tosco terminal to construct Hilo Terminal No. 3.

2.3 The bottom loading load rack is subject to 40 CFR, Part 60 – NSPS, Subpart XX, Standards of Performance for Bulk Gasoline Terminals because the bottom loading load rack was constructed after December 17, 1980.

2.4 The facility will be placed into the Compliance Data System (CDS) because the terminal is a covered source.

2.5 The Consolidated Emissions Reporting Rule (CERR) is not applicable because emissions from the facility do not exceed reporting levels pursuant to 40 CFR 51 (see table below).

<b>CERR APPLICABILITY</b>			
<b>Pollutant</b>	<b>Emissions (TPY)</b>	<b>CERR Triggering Levels (TPY)</b>	
		<b>1 year cycle (Type A sources)</b>	<b>3 year cycle (Type B sources)</b>
VOC	37.4	≥ 250	≥ 100

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- 2.6 A best available control technology analysis (BACT) analysis is required for new sources or modifications to existing sources that would result in a significant emissions increase as defined in HAR, Section 11-60.1. Because the modification to replace the tank seal system does not increase emissions, BACT is not applicable.
- 2.7 The purpose of Compliance Assurance Monitoring (CAM) is to provide reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 CFR, Part 64, for CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential pre-control emissions that are greater than the major source level; and (5) not otherwise be exempt from CAM. Although the load rack relies on a vapor recovery unit to achieve compliance with the federal VOC standard required by 40 CFR, Subpart XX and has potential pre-control emissions greater than the major source level for VOCs, CAM is not applicable to the load rack because the terminal is not a major source.
- 2.8 Prevention of significant deterioration (PSD) does not apply because emissions from the terminal are less than major source thresholds.
- 2.9 The facility is not a major source for hazardous air pollutants (HAPs) and is not subject to National Emission Standards for HAPs or maximum achievable control technology standards under 40 CFR, Parts 61 and 63.
- 2.10 The facility is a synthetic minor source because the throughput limitation of 210,240,000 gallons per year based on loading an 8,000 gallon tank truck every 20 minutes restricts emissions below major source thresholds. Maximum capacity of the terminal is 3,600 gallons per minute based on the capacity of the vapor system (1,892,160,000 gallons/year).

### **3. Insignificant Activities**

- 3.1 The terminal has the following insignificant activities:
- a. Oil water separator with 300 gallon skimmed oil tank and 300 gallon skimmed water tank qualifies for an insignificant activity pursuant to HAR §11-60.1-82(f)(7).
  - b. A 1,000 gallon waste-water storage tank is exempt pursuant to HAR §11-60.1-82(f)(7).

### **4. Alternate Operating Scenarios**

- 4.1 No alternate operating scenarios were proposed for the permit modification.

**5. Project Emissions**

5.1 Potential emissions from the bottom loading load rack with vapor recovery were based on the following:

- a) Maximum permitted throughput of 5,005,714 bbls/yr (210,240,000 gal/yr) based on loading an 8,000 gallon tank truck every 20 minutes;
- b) Loading gasoline into tank trucks as worst-case scenario;
- c) Control of VOCs with vapor recovery unit with the federal requirement for the system not to exceed more than 35 mg of total organic compound per liter of product loaded;
- d) A VOC emission factor of 8 mg/liter for leakage from tank truck when loading tank trucks based on a November 7, 2001 memo regarding EPA Emission Factors for Tank Truck Loading;
- e) Vapor mass fractions of pollutants for naphtha were multiplied by the total VOC emissions to determine HAP emissions; and
- f) Potential VOC/HAP emissions are summarized as follows:

<b>Bottom Loading Load Rack Emissions</b>		
<b>Pollutant</b>	<b>Vapor Mass Fraction</b>	<b>Emission (TPY)</b>
VOC	-----	38.3 <sup>a,b</sup>
Benzene	0.0102	0.391
Ethyl benzene	0.0002	0.008
Hexane	0.0651	2.493
Toluene	0.0025	0.096
Xylene (-m)	0.0005	0.019
Xylene (-p)	0.0003	0.011
Total HAPs----->		3.018

a: VOC emission from VRU:

$$(35 \text{ mg/liter})(210,240,000 \text{ gal/yr})(\text{liter}/0.246 \text{ gal})(10^{-3} \text{ g/mg})(\text{kg}/1,000 \text{ g})(2.2046 \text{ lb/kg})(\text{ton}/2,000 \text{ lb}) = 30.724 \text{ TPY}$$

b: VOC emission from Tank Truck:

$$(8 \text{ mg/liter})(210,240,000 \text{ gal/yr})(\text{liter}/0.246 \text{ gal})(10^{-3} \text{ g/mg})(\text{kg}/1,000 \text{ g})(2.2046 \text{ lb/kg})(\text{ton}/2,000 \text{ lb}) = 7.537 \text{ TPY}$$

5.2 Internal floating roof tank emissions were determined with EPA's Tanks 4.0 program. Emissions were based on a throughput of 5,005,714 bbls/yr (210,240,000 gal/yr) that is shared by the two permitted tanks storing naphtha. As such a throughput for each tank was assumed to be 105,120,000 gal/yr (210,240,000 ÷ 2) which correlates to 250 and 200 turnovers per year for Tank No. 4279 and 4298, respectively. It was assumed that each tank stored naphtha with a Reid vapor pressure of 11 psi worst-case. Vapor mass fractions of pollutants from data for naphtha were multiplied by the total VOC emission to determine HAP emissions. Potential VOC/HAP emissions are summarized as follows:

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Internal Floating Roof Tank Emissions				
Pollutant	Vapor Mass Fraction	Emission (TPY)		Total Emissions (TPY)
		Tank 4279	Tank 4298	
VOC	-----	3.595	3.153	6.748
Benzene	0.0102	0.037	0.032	0.069
Ethyl benzene	0.0002	0.001	0.001	0.002
Hexane	0.0651	0.234	0.205	0.439
Toluene	0.0025	0.009	0.008	0.017
Xylene (-m)	0.0005	0.002	0.002	0.004
Xylene (-o)	0.0003	0.001	0.001	0.002
Total HAPs----->		0.284	0.249	0.533

5.3 Equipment leaks emissions were determined based on New Equipment Leak Emission Factors for Petroleum Refineries, Gasoline Marketing, and Oil & Gas Production, February 1995 [EPA-453/R-95-017], Table 2.3. Emission factors were selected from the light liquid group for pump seals, valves, and connectors. Vapor weight fractions of pollutants from data for naphtha were multiplied by the total VOC emissions to determine HAP emissions. Emission estimates are summarized below as follows:

Equipment Leak Emissions					
Pollutant	Vapor Mass Fraction	Emission (TPY)			Total Emissions
		<sup>a</sup> Pump Seals	<sup>b</sup> Valves	<sup>c</sup> Connectors	
VOC	-----	0.021	0.015	0.006	0.042
Benzene	0.0102	0.0002	0.0002	6.1E-05	4.6E-04
Ethyl benzene	0.0002	4.2E-06	3E-06	1.2E-06	8.4E-06
Hexane	0.0651	0.0014	0.0009	3.9E-05	0.0023
Toluene	0.0025	5.3E-05	3.8E-05	1.5E-05	0.0001
Xylene (-m)	0.0005	1.1E-05	7.5E-06	3.0E-06	2.2E-05
Xylene (-o)	0.0003	6.3E-06	4.5E-06	1.8E-06	1.3E-05
Total HAPs----->		0.0017	0.0011	0.0001	0.0029

a: (4 pump seals)(5.4E-04 kg/hr – seal)(2.2 lb/kg)(8,760 hr/yr)(ton/2,000 lb) = 0.021 TPY VOC

b: (37 valves)(4.3E-05 kg/hr – valve)(2.2 lb/kg)(8,760 hr/yr)(ton/2,000 lb) = 0.015 TPY VOC

c: (88 connectors)(8.0E-06 kg/hr – connector)(2.2 lb/kg)(8,760 hr/yr)(ton/2,000 lb) = 0.006 TPY VOC

5.4 Worst-case yearly emissions of VOCs and HAPs from Hilo Petroleum Terminal No. 3 are as follows:

Facility Emissions				
Pollutant	Emissions (TPY)			Total Emissions (TPY)
	Bottom Loading Load Rack	Internal Floating Roof Tanks	Equipment Leaks	
VOCs	38.3	6.7	0.04	45.0
HAPS	3.018	0.5	0.0029	3.5

**6. Air Pollution Controls**

- 6.1 Emissions from the loading rack are controlled by a model no. MR-2x184DT John Zink vapor recovery unit. The system has two activated carbon vessels that recover hydrocarbon vapors from tank truck loading operations. The carbon adsorption vessels alternate in operation every 15 minutes. Vapors from loading tank trucks are recovered, condensed, and pumped back to the product supply tank.
- 6.2 Tank Nos. 4279 and 4298 are equipped with internal floating roofs and tank seal systems for the control of VOC and HAP emissions.

**7. Air Quality Assessment**

- 7.1 An ambient air quality impact assessment is not required for the terminal because air modeling is not required for VOCs.

**8. Significant Permit Conditions**

- 8.1 Add conditions that incorporate all seal systems that are allowed by NSPS, Subpart Kb.

Reason for 8.1: Incorporate per minor modification request. Seal systems can change during the tank's service life. There are three types of seal systems allowed by Subpart Kb regulations and each system has different inspection requirements. The change gives added flexibility for replacing tank seal systems.

**9. Conclusions and Recommendation**

- 9.1 Actual emissions from the facility should be less than those estimated because the terminal does not operate on a continuous basis. Actual throughput for the terminal during calendar year 2005 was 13,979,633 gallons per year which is less than 10% of the 210,240,000 gallon per year throughput limit estimated emissions are based on. The terminal is equipped with a vapor recovery unit to control VOC emissions from tank truck loading operations. The internal floating roofs and tank seal systems for Tank Nos. 4279 and 4298 provide additional control of VOC emissions. Recommend issuance of the permit subject to incorporation of the significant permit conditions and 45-day review by the Environmental Protection Agency.

Mike Madsen 2-27-2006