PROPOSED

PERMIT APPLICATION REVIEW
COVERED SOURCE PERMIT NO. 0081-01-C
Application for Modification No. 0081-05

Applicant: Chevron Products Company
Facility: Kahului Marketing Terminal
Location: 100-A Hobron Avenue, Kahului, Maui

Mailing Address: 100-A Hobron Avenue
Kahului, Hawaii 96732

Coordinates: UTM: 764,697 meters East and 2,312,892 meters North (NAD 83)

Equipment:

a. 8,867 barrel internal floating roof storage tank with mechanical shoe primary seal, Tank No. 1;
b. 2,347 barrel internal floating roof storage tank with mechanical shoe primary seal, Tank No. 2;
c. 1,452 barrel internal floating roof storage tank with mechanical shoe primary seal, Tank No. 7;
d. 1,527 barrel internal floating roof storage tank with mechanical shoe primary seal, Tank No. 9;
e. 11,754 barrel internal floating roof storage tank with mechanical shoe primary seal, Tank No. 11;
f. 4,230 barrel internal floating roof storage tank with mechanical shoe primary seal, Tank No. 13;
h. Bottom loading load rack with two (2) loading lanes and six (6) product load arms per loading lane; and
i. 4,800 gallon/minute capacity John Zink vapor combustion system, model no. ZCT-2-8-35-X-2/8-X-X, serial no. VC-954537.

Responsible Official:	Hugh Meshell	**Contact:**	John Aweeka
Title:	Terminal Manager	**Title:**	Environmental, Safety and Health Specialist
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1. Background.

1.1 Chevron Products Company has submitted an application for modification to its covered source permit to operate Kahului Marketing Terminal. The modification is for updating the permit to incorporate the most current requirements from 40 Code of Federal Regulations (CFR) Part 63, National Emission Standards for Hazardous Air Pollutants (NESHAP), Subpart BBBBBB. A bottom loading load rack is used at the terminal to distribute products that include motor gasoline, diesel fuel, ethanol, and jet fuel. The load rack is equipped with a vapor combustion system to control volatile organic compounds (VOCs). Total combined throughput for the load rack is limited to 5,631,429 barrels per year of aviation gasoline, denatured ethanol, motor gasoline, and naphtha (whole straight run gasoline). Product is received primarily from the Chevron Honolulu Marine Terminal on Oahu via barges and is stored at the terminal in above ground storage tanks. The Kahului Marketing Terminal occasionally obtains product from other sources. The standard industrial classification code for this facility is 5171 (Petroleum Bulk Stations and Terminals).

1.2 The applicant indicated on November 26, 2013 by e-mail that Chevron Products Company will construct and operate gasoline storage tanks in accordance with requirements from 40 CFR Part 60, New Source Performance Standards (NSPS), Subpart Kb as reference by 40 CFR Part 63, NESHAP, Subpart BBBBBB.

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 40 CFR Part 60, NSPS, Subpart K, Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973 and Prior to May 19, 1978 is not applicable to the gasoline storage tanks.

2.3 40 CFR Part 60, NSPS, Subpart Ka, Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984 is not applicable to the gasoline storage tanks.

2.4 40 CFR Part 60, 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 is not applicable to gasoline storage tanks because tanks at this facility were not constructed, reconstructed, or modified after 1984. Gasoline storage tanks, however, will be required to operate in accordance with 40 CFR Part 60, Subpart Kb as referenced in 40 CFR Part 63, NESHAP, Subpart BBBBBB.

2.5 40 CFR Part 60, NSPS, Subpart XX, Standards of Performance for Bulk Gasoline Terminals is applicable to the bottom loading load rack because the load rack was constructed after December 17, 1980.

2.6 40 CFR Part 63, NESHAP, Subpart BBBBBB, National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities is applicable because this facility emits hazardous air pollutants (HAPs) from an area source gasoline distribution bulk terminal. The facility is designated a gasoline distribution bulk terminal because the gasoline throughput, based on the facility's permit limit, is greater than 20,000 gallons per day. Option 2 from Table 2 of 40 CFR Part 63, Subpart BBBBBB, applies to the load rack because records indicate the actual gasoline throughput is less than 250,000 gallons per day. Tank Nos. 1, 2, 7, 9, 11, and 13 are subject to 40 CFR Part 63, Subpart BBBBBB, because the tanks are located at a gasoline distribution bulk terminal and will store gasoline as a worst-case scenario.

2.7 The Air Emissions Reporting Requirments (AERR) is not applicable because emissions from the facility do not exceed reporting levels pursuant to 40 CFR 51.

2.8 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. There are no modifications at the terminal that increase emissions. As such, BACT is not applicable.

2.9 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 combustion system to achieve compliance with the VOC standards specified in 40 CFR Part 60, Subpart XX, and has potential pre-control emissions greater than the major source level for VOCs, CAM is not applicable because this facility is not a major source.

2.10 Prevention of significant deterioration (PSD) does not apply because emissions from the terminal are less than major source thresholds.

2.11 The facility is a synthetic minor source because the throughput limitation of 5,631,429 barrels (236,520,018 gallons) per year ensures that emissions from the facility are below major source thresholds. Maximum capacity of the terminal is 4,800 gallons per minute or 2,522,880,000 gallons per year based on the vapor combustion system's capacity.

3. Insignificant Activities

3.1 The following is a list of insignificant activities at the marketing terminal. Tanks listed in (a) through (e), (g), (h), (j), and (k) are exempt pursuant to HAR §11-60.1-82(f)(7). Tanks listed in (i) and (l) are exempt in accordance with HAR §11-60.1-82(f)(1). The sump and oil water separator listed in (m) and (n) are exempt pursuant to HAR §11-60.1-82(f)(7).

a. 18,497 barrel vertical fixed roof Tank No. 3 storing low sulfur diesel;
b. 5,011 barrel vertical fixed cone roof Tank No. 4 storing Jet-A;
c. 3,546 barrel vertical fixed cone roof Tank No. 5 storing ultra-low-sulfur diesel;
d. 1,489 barrel vertical fixed cone roof Tank No. 6 storing Jet-A;
e. 5,859 barrel vertical fixed cone roof Tank No. 10 storing Jet-A;
f. 561 barrel vertical fixed cone roof Tank No. 14 storing transmix;

g. 11,078 barrel vertical fixed cone roof Tank No. 15 that is out of service;
h. 1,470 barrel vertical fixed cone roof Tank No. 19 storing ultra-low-sulfur diesel;
i. 929 barrel vertical fixed cone roof Tank No. 20 that is out of service;
j. 7,724 gallon horizontal fixed roof additive Tank No. 22;
k. 7,724 gallon horizontal fixed roof additive Tank No. 23;
l. 499 gallon propane tank;
m. 9,800 gallon concrete sump; and
n. 350 gallon oil water separator.

4. Alternate Operating Scenarios

4.1 No alternate operating scenarios were proposed for this permit modification.

5. Project Emissions

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

a. Maximum permitted throughput of 5,631,429 barrels/year (236,520,018 gallons/year);
b. Maximum 4,800 gallon/minute gasoline throughput and manufacturer's data to determine NO_X and CO emissions;
c. Loading of gasoline into cargo tanks as worst-case scenario;
d. Maximum VOC emission of 35 mg per liter of gasoline loaded based on standard specified for total organic compounds (TOCs) in 40 CFR;
e. A VOC emission factor of 8 mg/liter for leakage from cargo tanks when loading gasoline based on a November 7, 2001 memo regarding EPA Emission Factors for Tank Truck Loading;
f. An emission factor for NO_X of 4 mg/liter of gasoline loaded based on manufacturer's information;
g. An emission factor for CO of 10 mg/liter of gasoline loaded based on manufacturer's information;
h. Use of a mass balance calculation to determine SO_2 emissions (it was assumed that 0.1% sulfur was present in VOCs from tank truck loading losses). Available literature indicates that gasoline contains as much as 1,000 ppm sulfur (0.1% sulfur). The AP-42 emission factor (12.46 SPM/T) was used to determine loading losses. A saturation factor (S) of 0.6 for bottom loading tank truck – normal dedicated service was used. The true vapor pressure (P) was assumed to be 11 psia. The molecular weight (M) of gasoline was assumed to be 66. A temperature (T) of 536 ^{O}R (76 ^{O}F + 460) was used for the equation);
i. Use of vapor mass fractions for components from gasoline multiplied by the total VOC emissions to determine HAP emissions; and
j. Potential emissions are summarized as follows:

Bottom Loading Load Rack (Gasoline)				
Pollutant	Vapor Mass Fraction	Emission (lb/hr)	Emission (g/s)	Emission (TPY)
VOC (see Notes a &b)	--------------	------------	-----------	42.5
NO_x (see Notes c, d ,& e)	-------------	9.620	1.215	4.0
CO (See Notes f, g, & h)	------------	24.050	3.037	9.9
SO_x (See Notes i, j, k, & 1)	------------	5.813	0.734	2.4
Benzene	0.0060	------------	------------	0.255
Hexane (n)	0.0053	------------	------------	0.225
Toluene	0.0072			0.306
Xylene (-m)	0.0022	------------	------------	0.094
Total HAPs------->				0.880

a: (35 mg VOC/liter)(236,520,018 gal/yr)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(ton/2,000 lb) = 34.565 TPY VOC from vapor combustion system
b: (8 mg VOC/liter)(236,520,018 gal/yr)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(ton/2,000 lb) = 7.900 TPY VOC from tank truck cargo tank leaks
c: (4,800 gal/min)(4 mg NO_X/liter)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(60 min/hr) = 9.620 lb/hr NO_X
d: (9.620 lb NO_X/hr)(hr/3,600 sec)(kg/2.2 lb)(1,000 g/kg) = 1.215 g/sec NO_X
e: (4 mg NO_X/liter)(236,520,018 gal/yr)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(ton/2,000 lb) = 3.950 TPY NO_X
f: (4,800 gal/min)(10 mg CO/liter)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(60 min/hr) = 24.050 lb/hr CO
g: (24.050 lb CO/hr)(hr/3,600 sec)(kg/2.2 lb)(1,000 g/kg) = 3.037 g/sec CO
h: (10 mg CO/liter)(236,520,018 gal/yr)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(ton/2,000 lb) = 9.876 TPY CO
i: 12.46(0.6)(11)(66)/536 (0.1/100) = 0.0101 lb sulfur/1,000 gal = 0.0101(64.06/32.06 S) = 0.0202 lb SO_2/1,000 gal
j: (0.0202 lb SO_2/1,000 gal)(4,800 gal/min)(min/60 sec)(1,000 g/kg)(kg/2.2lb) = 0.734 g/sec SO_2
k: (0.734 g/sec)(3,600 sec/hr)(kg/1,000 g)(2.2 lb/kg) = 5.813 lb/hr SO_2
l: (0.0202 lb/1,000 gal)(236,520,000 gal/yr)(ton/2,000 lb) = 2.389 TPY SO_2

5.2 Emissions from the tank farm were based on the total combined gasoline throughput for Tank Nos. 1, 7, 9, 11, and 13 of 154,543,025 gallons per year. Emissions from Tank No. 2 were based on an ethanol throughput of 13,416,907 gallons per year. Vapor mass fractions of compounds for motor gasoline and denatured ethanol were multiplied by the total VOC emissions to determine total HAP emissions. Emissions for the review were only included from permitted tanks. Potential emissions from permitted tanks are shown in Enclosure (1) and summarized below.

Tank Farm Emissions							
Pollutant	**TPY Emissions**						
	Tank 1	Tank 2	Tank 7	Tank 9	Tank 11	Tank 13	Total
VOC	2.4	0.5	3.0	1.4	4.5	0.9	12.7
HAPs	0.051	0.011	0.064	0.030	0.095	0.019	0.27

5.3 Equipment leak emissions were determined based on New Equipment Leak Emission Factors for Petroleum Refineries, Gasoline Marketing, and Oil & Gas Production, February1995 [EPA-453/R-95-017], Table 2.3. Emission factors were selected from the light liquid and gas groups for pumps, seals, valves, connectors, and other components. The number of pumps, valves, connectors, and other components were updated since the previous permit application. Vapor weight fractions of compounds from gasoline were multiplied by the total VOC emissions to determine HAP emissions. Emission estimates are shown in Enclosure (2) and summarized below as follows:

Equipment Leak Emissions						
Pollutant	**Vapor Mass Fraction**	**Emission (TPY)**				**Total Emissions**
		Fittings	**Other**	**Pumps**	**Valves**	
VOC	------	0.336	0.114	0.104	0.388	0.9
Benzene	0.0060					0.006
Hexane (n)	0.0052					0.005
Toluene	0.0070					0.007
Xylene (-m)	0.0020					0.0021
					Total HAPs---------→	0.020

5.4 Total VOC and HAP emissions from Kahului Marketing Terminal are as follows:

Facility Emissions				
Pollutant	**Emissions (TPY)**			**Total Emissions (TPY)**
	Bottom Loading Load Rack	**Internal Floating Roof Tanks**	**Equipment Leaks**	
VOCs	42.5	12.7	0.9	56.1
NO_X	4.0	------	------	4.0
CO	9.9	------	------	9.9
SO_2	2.4	------	------	2.4
HAPS	0.880	0.270	0.020	1.17

6. <u>Air Pollution Controls</u>

6.1 The loading rack is equipped with a model no. ZCT-2-8-35-X2/8-X-X John Zink vapor combustion system to control VOC and HAP emissions. The maximum specified tank truck loading capacity for the vapor combustion system is 4,800 gallons per minute. Minimum specified tank truck loading rate for the vapor combustion system is 15 gallons per minute.

6.2 Tank Nos. 1, 2, 7, 9, 11, and 13 are equipped with internal floating roofs and tank seal systems to control VOC and HAP emissions.

7. <u>Air Quality Assessment</u>

7.1 No changes to the facility are proposed that increase emissions from the vapor combustion system. Therefore, an air modeling assessment for the vapor combustion system is not required.

8. <u>Significant Permit Conditions</u>

8.1 Add conditions that incorporate control measures for equipment leaks, tanks, and the load rack's vapor processing system pursuant to 40 CFR Part 63, Subpart BBBBBB.

Reason for 8.1: Required as specified in 2.6 of this permit application review report.

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. The terminal is equipped with a vapor combustion system to control VOC and HAP emissions from tank truck loading operations. The internal floating roofs and tank seal systems for Tank Nos. 1, 2, 7, 9, 11, and 13 provide additional control of VOC and HAP emissions. Recommend issuance of the permit subject to incorporation of the significant permit conditions and the 45-day EPA review period.

Mike Madsen 12-16-2013