PROPOSED

PERMIT APPLICATION REVIEW
COVERED SOURCE PERMIT (CSP) NO. 0081-01-C
Application Renewal No. 0081-03

Applicant: Chevron Products Company (Kahului Marketing Terminal)

Located at: 100-A Hobron Avenue, Kahului, Maui

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1. Background

1.1 Chevron Products Company has applied for a renewal to their covered source permit for the Kahului Marketing Terminal. The terminal consists of tanks and one bottom loading load rack. The load rack has two loading lanes, six load arms per loading lane, and is equipped with a vapor combustion system to reduce volatile organic compound (VOC) emissions. Permitted tanks at the facility include Tank Nos. 1, 2, 7, 9, 11, and 13 that are equipped with internal floating roofs and seal systems to control VOCs. Products distributed at the terminal include gasoline, jet fuel, and diesel. The standard industrial classification code for this facility is 5171 (Petroleum Bulk Stations and Terminals).

1.2 A site inspection of the Kahului terminal on June 2, 2004 [see Enclosure (1)] disclosed the following:

a. Each of the two loading lanes are equipped with a scully to activate the vapor combustion system.

b. Each loading lane for the load rack is equipped with two vapor lines to direct vapors displaced from tank truck loading operations to the vapor combustion system.

c. Six product load arms for each loading lane distribute the following: plus unleaded gasoline, regular unleaded gasoline, supreme unleaded gasoline, low sulfur diesel, high sulfur diesel, and Jet A fuel.

d. The vapor combustion system has one burner to ignite vapors at the base of stack for vapor combustion system.

e. A propane tank at the facility supplies auxiliary fuel to the vapor combustion system for combustion of VOCs.

f. The vapor combustion system exhibited 0% opacity during operation to process vapors from tank truck loading.

g. There is no emergency diesel engine generator to supply electricity to the terminal during power outages.

h. Tank trucks have dedicated tanks for distribution of Jet A and gasoline.

i. Two magnahelic gages were observed for each loading lane. Maximum gage pressure readings were just below 10 inches water during tank truck loading. Federal requirements specify a limit of 4,500 Pascals (450 mm water - about 18 inch water).

j. Tank No. 2 was empty during time of the site inspection.

k. The serial no. for the vapor combustion system was verified to be VC-954537.

l. The following additional insignificant activities from those listed by the applicant were observed at the terminal:

   i. 7,724 gallon horizontal fixed roof additive Tank No. 22;
   ii. 7,724 gallon horizontal fixed roof additive Tank No. 23;
   iii. 499 gallon propane tank;
   iv. 9,800 gallon concrete sump; and
   v. 350 gallon oil water separator.

1.3 Tank No. 1 has undergone extensive alterations to upgrade the storage vessel for handling gasoline. The alterations do not trigger a reconstruction because costs for the new construction/components are less than 50 percent of the costs of a comparable tank that is entirely new. The cost analysis, shown in the table below, is based on information from Chevron Products Company regarding Tank No. 1 upgrades. Costs for the upgrades were obtained from Matrix (the tank contractor). EPA was also contacted for information on costs to include in the applicability determination. For the determination, tank alterations for reconstruction applicability are those involving the affected facility. Pursuant to 40 Code of Federal Regulations (CFR), New Source Performance Standards (NSPS), Part 60, Subpart Kb, storage vessel means each tank, reservoir, or container used for the storage of volatile organic liquids but does not include:

(1) Frames, housings, auxiliary supports, or other components that are not directly involved in the containment of liquids or vapors;

(2) Subsurface caverns or porous rock reservoirs; or

(3) Process tanks.

PROPOSED

Scope	Project Cost	Fixed Capital Cost [a,b,c]	
		Reconstruction Applicability	Entirely New Tank
aluminum floating roof demolition (included in cost for reconstruction worst-case)	$5,830	$5,830	---
new steel pontoon floating roof (see note d)	$168,681	$115,981	$115,981
floating suction (to draw product from above the tank bottom)	$14,632	$14,632	$14,632
diffuser (to prevent static electricity build-up when filling tank)	$4,664	$4,664	$4,664
gauge pole (pole that goes through floating roof for product sampling)	$4,780	$4,780	$4,780
high level piping	$3,250	$3,250	$3,250
shell portion for man-way and nozzle modifications (see note e)	$32,312	$32,312	$32,312
drip ring	$4,512	$4,512	$4,512
hydro-testing tank shell (see note e)	$5,000	$5,000	$5,000
miscellaneous (fire watch, safety meetings, etc.)	$37,232	---	---
subcontractor painting of special coating at tank bottom & cost to oversee project (see note c)	$32,300	$32,300	$32,300
pipe modifications (redirect piping outside of tank)	$18,500	---	---
deep sump installation	$4,688	$4,688	$4,688
roof handrail	$9,081	---	---
repairs to piping outside tank	$10,313	---	---
catwalk repairs and roof vents (all costs for roof vents worst-case)	$9,390	$9,390	$9,390
new tank construction of shell and cone roof (see note e)	---	---	$207,000
foundation	---	---	$40,000
double bottom (see note f)	$54,606	$54,606	$90,000
coating (see note g)	$30,000	$30,000	$90,000
subcontractors (see note c)	---	---	$40,000
freight (see notes b and e)	---	---	$24,000
subsistence /food and lodging (see notes b, e, and h)	$15,000	$15,000	$65,000
travel (see notes b and e)	---	---	$18,000
TOTAL	$464,771	$336,945	$805,509
		(336,945/805,509)(100) = 42%	

a: Existing tank was painted and equipped with aluminum floating roof, floating suction, diffuser, gauge pole, high level piping inside tank, drip ring, double bottom, sump, roof handrail, catwalk connecting tanks, and roof vents.
b. Costs of travel, freight, and subsistence (food and lodging) included in costs for Tank No. 1 upgrades.
c. No subcontractors involved with Tank No. 1 alterations, except for painting of special coating at tank bottom.
d. Cost of new aluminum floating roof included in costs for reconstruction applicability and entirely new tank.
e. New tank costs for subcontractors, freight, subsistence, and travel are for tank shell and cone roof construction only. Cost to shell portion for man-way and nozzle modifications are not included. Costs for hydro-testing is also not included.
f: Cost for bottom plate replacement applied to reconstruction applicability.
g. Cost to paint sides and top of tank applied to reconstruction applicability.
h. Subsistence costs for shell portion of man-way and nozzle modifications included in reconstruction applicability.

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
    - §11-60.1-39 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 The new bottom loading load rack is subject to 40 Code of Federal Regulations (CFR), Part 60 - New Source Performance Standards (NSPS), Subpart XX, Standards of Performance for Bulk Gasoline Terminals because the bottom loading load rack was constructed after December 17, 1980.

2.3 The facility will be placed into the Compliance Data System (CDS) because Kahului Marketing Terminal is a covered source.

2.4 Annual emissions reporting is required because the terminal is a covered source.

2.5 The facility is a synthetic minor source because the yearly throughput limitation of loading 5,631,429 barrels of gasoline restricts emissions from the terminal to below major source thresholds. Maximum capacity of the terminal is 4,800 gallons per minute based on the capacity of the vapor combustion system (2,522,880,000 gal/yr). The yearly throughput permit limitation above was based on loading one 9,000 gallon tank truck every 20 minutes (236,520,000 gal/yr).

2.6 There are no modifications proposed by the applicant for this permit renewal that increase emissions. As such, a Best Available Control Technology (BACT) analysis is not required.

2.7 Prevention of Significant Deterioration (PSD) does not apply because Kahului Marketing Terminal is no longer a major source.

2.8 The purpose of Compliance Assurance Monitoring (CAM) is to provide reasonable assurance that compliance is being achieved with large emission 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 precontrol 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 federal VOC standard required by 40 CFR 60, Subpart XX and has potential precontrol emission greater than the major source level for VOC, CAM is not applicable to the load rack because this terminal is not a major source.

2.9 The facility is not a major source for hazardous air pollutants (HAPs) and is not subject to any National Emissions Standards for Hazardous Air Pollutants (NESHAPS) or Maximum Achievable Control Technology (MACT) standards under 40 CFR Parts 61 or 63.

2.10 Consolidated emissions reporting rule (CERR) is not applicable because emissions from the facility are less than reporting levels pursuant to 40 CFR 51, Subpart A (see table below).

Pollutant	Facility Emissions (TPY)	CERR Triggering Levels (TPY)	
		1 year cycle (type A sources)	3 year cycle (type B sources)
VOC	47.8	≥ 2,500	≥ 100
NO_x	4.0	≥ 2,500	≥ 100
CO	9.9	≥ 250	≥ 100
SO_X	2.4	≥ 2,500	≥ 1,000

3. Insignificant Activities

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

a. 18,497 barrel vertical fixed roof Tank No. 3 currently storing high sulfur diesel;
b. 5,011 barrel vertical fixed cone roof Tank No. 4 currently storing jet fuel;
c. 3,546 barrel vertical fixed cone roof Tank No. 5 currently storing low sulfur diesel;
d. 1,489 barrel vertical fixed cone roof Tank No. 6 currently storing jet fuel;
e. 5,859 barrel vertical fixed cone roof Tank No. 10 currently storing jet fuel;
f. 561 barrel vertical fixed cone roof Tank No. 14 currently storing transmix;
g. 11,078 barrel vertical fixed cone roof Tank No. 15 currently storing fuel oil No. 6;
h. 1,470 barrel vertical fixed cone roof Tank No. 19 currently storing jet fuel;
i. 929 barrel vertical fixed cone roof Tank No. 20 currently not in service;
j. 7,724 gallon horizontal fixed roof additive Tank No. 22;
j. 7,724 gallon horizontal fixed roof additive Tank No. 23;
k. 499 gallon propane tank;
l. 9,800 gallon concrete sump; and
m. 350 gallon oil water separator.

4. Alternative Operating Scenarios

4.1 No alternate operating scenarios were proposed for the renewal.

5. Air Pollution Controls

5.1 The bottom loading load rack is equipped with a John Zink vapor combustion system to control VOC emissions from tank truck loading. Maximum specified tank truck loading rate for the vapor combustion system is 4,800 gallons-per-minute. Minimum specified loading rate for the vapor combustion system is 150 gallons-per-minute. The burner pilot fuel is propane.

5.2 Tank Nos. 1, 2, 7, 9, 11, and 13 are equipped with internal floating roofs and seal systems to control VOCs.

6. Project Emissions

6.1 Assumptions to determine emissions from the bottom loading load rack are the same as those stated in permit application review No. 0081-02. VOC emissions were based on the federal VOC emissions limit of 35 mg per liter of gasoline loaded and throughput limit. NO_x, CO, and SO_x emissions were based on manufacturer's data and gasoline throughput limit. Hazardous air pollutant emissions were based on vapor weight fraction data supplied by Chevron and maximum VOC emissions for loading tank trucks. Emissions for the loading rack are summarized below.

Bottom Loading Load Rack (Gasoline Worst-Case)				
Pollutant	Vapor Mass Fraction	Emission (lb/hr)	Emission (g/s)	Emission (TPY)
VOC (see Note a)	----------	----------	----------	34.6
NO_x (see Notes b, c and d)	----------	9.620	1.215	4.0
CO (See Notes e, f, and g)	----------	24.050	3.037	9.9
SO_x (See Note h, i, j, and k)	----------	5.813	0.734	2.4
benzene	0.0021	----------	----------	0.073
ethylbenzene	0.0003	----------	----------	0.010
toluene	0.0064	----------	----------	0.221
hexane	0.0074	----------	----------	0.256
o-Xylene	0.0004	----------	----------	0.014
p-Xylene	0.0004	----------	----------	0.014
m-Xylene	0.0010	----------	----------	0.035
			Total HAPs---------->	0.623

a: (35 mg/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 ton/yr**
b: (4,800 gal/min)(4 mg/liter)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(60 min/hr) = **9.620 lb/hr**
c: (9.620 lb/hr)(hr/3,600 sec)(kg/2.2 lb)(1,000 g/kg) = **1.215 g/sec**
d: (4 mg/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 ton/yr**
e: (4,800 gal/min)(10 mg/liter)(liter/0.264 gal)(10^{-3} g/mg)(kg/1,000 g)(2.2046 lb/kg)(60 min/hr) = **24.050 lb/hr**
f: (24.050 lb/hr)(hr/3,600 sec)(kg/2.2 lb)(1,000 g/kg) = **3.037 g/sec**
g: (10 mg/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 ton/yr**
h: 12.46(0.6)(11)(66)/536 (0.1/100) = 0.0101 lb sulfur/1,000 gal = 0.0101 (64.06/32.06) = 0.0202 lb/1,000 gal
i: (0.0202 lb/1,000 gal)(4,800 gal/min)(min/60 sec)(1,000 g/kg)(kg/2.2lb) = **0.734 g/sec**
j: (0.734 g/sec)(3,600 sec/hr)(kg/1,000 g)(2.2 lb/kg) = **5.813 lb/hr**
k: (0.0202 lb/1,000 gal)(236,520,000 gal/yr)(ton/2,000 lb) = **2.389 ton/yr**

6.2 Emissions from the internal floating roof storage tanks were determined by Chevron Products Company using EPA's Tanks 4.0 program. It was assumed that the tanks handled gasoline worst-case. Emissions were based on the throughput of 5,631,429 bbls/yr (236,520,018 gal/yr). Vapor weight fractions for pollutants from data for RUL gasoline, MUL gasoline, and SUL gasoline were multiplied by total VOC emissions to determine HAP emissions. Potential VOC emissions are summarized as follows:

Internal Floating Roof Tank Emissions							
Pollutant	Vapor Mass Fraction			Emissions (TPY)			Total Emissions (TPY)
	Tank No. (Product)			Tank No. (Product)			
	1 & 2 (SUL)	7 & 9 (MUL)	11 & 13 (RUL)	1 & 2 (SUL)	7 & 9 (MUL)	11 & 13 (RUL)	
VOC	--------	--------	--------	4.3	3.9	5.0	13.2
benzene	0.0003	0.0017	0.0020	0.0013	0.0066	0.0100	0.0179
t-m-benzene	---------	0.0001	---------	--------	0.0004	---------	0.0004
ethylbenzene	0.0001	0.0003	0.0003	0.0004	0.0012	0.0015	0.0031
n–Hexane	0.0072	0.0072	0.0072	0.0310	0.0281	0.0360	0.0951
toluene	0.0007	0.0052	0.0061	0.0030	0.0203	0.0305	0.0538
m-Xylene	0.0002	0.0009	0.0009	0.0009	0.0035	0.0045	0.0089
o-Xylene	0.0001	0.0004	0.0004	0.0004	0.0016	0.0020	0.0040
p-Xylene	0.0001	0.0004	0.0004	0.0004	0.0016	0.0020	0.0040
		Total HAPs---------->		0.037	0.063	0.087	0.187

6.3 For this review, emissions from equipment leaks are the same as those for stated in permit application review No. 0081-02 using EPA's Protocol for Equipment Leak Emission Estimates, November 1995, Tables 2-2 and 2-3. Vapor weight fractions from that used for emissions calculations from the load rack were used to determine HAP emissions. Emission estimates are summarized below as follows:

Equipment Leaks Emissions						
Pollutant	Vapor Mass Fraction	Emissions (TPY)				Total Emissions (TPY)
		Valves[a]	Fittings[b]	Pump Seals[c]	Others	
VOC	-----	0.188	0.223	0.031	0.025	0.467
benzene	0.0021	----------				0.0010
ethylbenzene	0.0003	----------				0.0001
toluene	0.0064	----------				0.0030
hexane	0.0074	----------				0.0035
m-xylene	0.0010	----------				0.0005
o-xylene	0.0004	----------				0.0002
p-xylene	0.0004	----------				0.0002
					Total HAPs-------	0.009
>						

a: (455 valves)(4.3E-05 kg/hr-valve)(8,760 hr/yr)(2.2 lb/kg)(ton/2,000 lb) = 0.188 TPY
b: (2,895 fitting/connector)(8.0E-06 kg/hr-fitting/connector)(8,760 hr/yr)(2.2 lb/kg)(ton/2,000 lb) = 0.223 TPY
c: (6 pump seal)(5.4E-04 kg/hr-pump seal)(8,760 hr/yr)(2.2 lb/kg)(ton/2,000 lb) = 0.031 TPY
d: (20 other)(1.3E-04 kg/hr-other)(8,760 hr/yr)(2.2 lb/kg)(ton/2,000 lb) = 0.025 TPY

6.4 Worst-case yearly emissions of VOCs and HAPs from operation of the Kahului Marketing Terminal are shown below:

Facility-Wide Emissions				
Pollutant	Emissions (TPY)			Total Emissions (TPY)
	Bottom Loading Load Rack	Internal Floating Roof Tanks	Equipment Leaks	
VOC	34.6	13.2	0.467	48.3
NO_x	4.0	---------	---------	4.0
CO	9.9	---------	---------	9.9
SO_x	2.4	---------	---------	2.4
HAP	0.623	0.187	0.009	0.819

7. Air Quality Assessment

7.1 No changes to the permit are proposed for this renewal that increase emissions from the vapor combustion system. As such, an ambient air quality modeling assessment is not required. Results from the previous air modeling assessment for the vapor combustion system are shown below for information.

PREDICTED AMBIENT AIR QUALITY IMPACTS

AIR POLLUTANT	AVERAGING TIME	IMPACT (ug/m^3)	BACKGROUND (ug/m^3)	TOTAL IMPACT (ug/m^3)	AIR STANDARD (ug/m^3)	PERCENT STANDARD
SO_2	3-Hour	3	30	33	1,300	3
	24-Hour	1	6	7	365	2
	Annual	<1	2	2	80	<1
NO_2	Annual	<1	9	9	70	29
CO	1-Hour	12	2,508	2,520	10,000	25
	8-Hour	8	1,055	1,063	5,000	21

8. Significant Permit Conditions

8.1 Update permit as applicable.

9. Conclusion and Recommendation

9.1 The bottom loading load rack is equipped with a vapor combustion system to control VOC emissions. Additional VOC controls are provided by internal floating roofs and tank seal systems for the facility's six permitted tanks. The total combined throughput of the various grades of motor gasoline at the terminal during calendar year 2003 was 575,274 barrels which is far lower than the 5,631,429 barrel gasoline throughput limit that emissions are based on. Recommend issuance of the permit renewal pending 30-day public comment period and 45-day review by EPA.

Mike Madsen 8-26-2004