PROPOSED

Covered Source Permit Review Summary

Application Nos.: 0212-35 (Minor Modification application)
0212-36 (Minor Modification application)
0212-37 (Significant Modification application)

Permit No.: 0212-01-C

Applicant: Tesoro Hawaii Corporation

Facility Title: Petroleum Refinery
Tesoro Hawaii Corporation
91-325 Komohana Street
Kapolei, Hawaii 96707

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Application Dates: Minor Modification Application no. 0212-35: April 18, 2011
Minor Modification Application no. 0212-36: November 21, 2011
Significant Modification Application no. 0212-37: August 20, 2012
Additional information dated December 21, 2012
Additional information dated January 2, 2013

Proposed Project:

SICC 2911 (Petroleum Refining)

Minor Modification Application No. 0212-35

The applicant is requesting to change the service of petroleum storage tank no. 605 from naphtha/gasoline to heavy oil and to convert the tank from an internal floating roof tank to a vertical floating roof tank.

In addition to limiting Tank 605 to heavy oil service by embracing equipment descriptions and permit conditions that limit the TVP to less than 1.5 psia, the refinery proposes to further limit the service of Tank 605 to just diesel (and heavier) service. An additional permit condition is

proposed that would limit the liquid HAP content of the hydrocarbons stored in the tank to no more than 0.5% wt. This condition would have the effect of precluding Tank 605 from being used to store jet fuel and kerosene. This would ensure that HAP emissions would not exceed the 500 lb/year threshold for a minor modification.

This modification is considered a minor modification since it:

(1) Does not increase the emissions of any air pollutant above the permitted emission limits;
(2) Does not result in or increase the emissions of any air pollutant not limited by permit to levels equal to or above:
    (A) 500 pounds per year of a hazardous air pollutant;
    (B) twenty-five (25) percent of significant amounts of emission as defined in section 11-60.1-1, paragraph (1) in the definition of "significant";
    (C) five (5) tons per year of carbon monoxide; or
    (D) two (2) tons per year of each regulated air pollutant other than carbon monoxide;
(3) Does not violate any applicable requirement;
(4) Does not involve significant changes to existing monitoring requirements or any relaxation or significant change to existing reporting or recordkeeping requirements in the permit. Any change to the existing monitoring, reporting, or recordkeeping requirements that reduces the enforceability of the permit is considered a significant change;
(5) Does not require or change a case-by-case determination of an emission limitation or other standard, a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis;
(6) Does not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement, and that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject. Such terms and conditions include:
    (A) A federally enforceable emissions cap assumed to avoid classification as a modification pursuant to any provision of Title I of the Act or subchapter 7; and
    (B) An alternative emissions limit approved pursuant to regulations promulgated pursuant to Section 112(i)(5) of the Act or subchapter 9; and
(7) Is not a modification pursuant to any provision of Title I of the Act.

A permit modification application fee of $200.00 for a minor modification was submitted by the applicant and processed.

<u>Minor Modification Application No. 0212-36</u>

The applicant is requesting to list the spent caustic tank no. 517 under the Petroleum Storage Tank section (Attachment II(M)) of Covered Source Permit No. 0212-01-C to reflect that tank no. 517 is subject to regulation as a heavy oil storage tank. Tank no. 517 is currently listed in the Wastewater Treatment Unit (WTU) section (Attachment II(J)) of Covered Source Permit No. 0212-01-C and that listing and corresponding permit conditions would be retained because they are still applicable. Although the primary function of tank no. 517, as a receiver of spent caustic (wastewater) is unchanged, over time due to an accumulation of jet and kerosene, the contents of tank no. 517 is, now petroleum hydrocarbons.

This modification is considered a minor modification since it:

(1) Does not increase the emissions of any air pollutant above the permitted emission limits;
(2) Does not result in or increase the emissions of any air pollutant not limited by permit to levels equal to or above:
    (A) 500 pounds per year of a hazardous air pollutant;
    (B) twenty-five (25) percent of significant amounts of emission as defined in section 11-60.1-1, paragraph (1) in the definition of "significant";
    (C) five (5) tons per year of carbon monoxide; or
    (D) two (2) tons per year of each regulated air pollutant other than carbon monoxide;
(3) Does not violate any applicable requirement;
(4) Does not involve significant changes to existing monitoring requirements or any relaxation or significant change to existing reporting or recordkeeping requirements in the permit. Any change to the existing monitoring, reporting, or recordkeeping requirements that reduces the enforceability of the permit is considered a significant change;
(5) Does not require or change a case-by-case determination of an emission limitation or other standard, a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis;
(6) Does not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement, and that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject. Such terms and conditions include:
    (A) A federally enforceable emissions cap assumed to avoid classification as a modification pursuant to any provision of Title I of the Act or subchapter 7; and
    (B) An alternative emissions limit approved pursuant to regulations promulgated pursuant to Section 112(i)(5) of the Act or subchapter 9; and
(7) Is not a modification pursuant to any provision of Title I of the Act.

A permit modification application fee of $200.00 for a minor modification was submitted by the applicant and processed.

<u>Significant Modification Application No. 0212-37</u>

The applicant is requesting to change the service of petroleum storage tank no. 503 from heavy oil to naphtha/gasoline. Tank no. 503 is already equipped with an external floating roof (EFR) and mechanical shoe primary seal with a rim-mounted secondary seal system, therefore no physical changes are required to store light hydrocarbons. However, the tank is currently only permitted to store heavy oil with a TVP up to 1.5 psia. Modifying the permit would allow tank no. 503 to store light petroleum liquids (i.e. naphtha and gasoline) with a TVP up to 11 psia. The change in service will cause VOC and HAP emissions to increase and the covered source permit will have to be modified to address the applicable federal regulations, specifically 40 CFR Part 63, Subpart CC. This is considered a significant modification to a covered source permit.

A permit modification application fee of $1,000.00 for a significant modification was submitted by the applicant and processed.

Additional Changes to Attachment II(M)

The applicant has requested additional changes to Attachment II(M) of the covered source permit. This is due to modifications that were approved by the Department but the applicant did not construct nor has plans to, therefore, the applicant is requesting the following additional changes to the permit:

1. Crude tank 108 was never built.
2. The extra layer was never installed on crude tank 102, so like some of the other tanks its nominal capacity should be lowered back down to 13,989,087 gallons.

Equipment:

One (1) – 4,605,476 gallon (nominal) vertical fixed roof storage tank identified as Tank 605.

One (1) – 474,024 gallon (nominal) vertical fixed roof storage tank identified as Tank 517.

One (1) - 1,998,448 gallon (nominal) external floating roof storage tank identified as Tank 503.

Applicable Requirements:

Hawaii Administrative Rules (HAR)
Title 11, Chapter 59 Ambient Air Quality Standards
Title 11, Chapter 60.1 Air Pollution Control
Subchapter 1 General Requirements
Subchapter 2 General Prohibition
HAR 11-60.1-31 Applicability
HAR 11-60.1-39 Storage of Volatile Organic Compounds
Subchapter 5 Covered Sources
Subchapter 6 Fees for Covered Sources, Noncovered Sources, and Agricultural Burning
HAR 11-60.1-111 Definitions
HAR 11-60.1-112 General Fee Provisions for Covered Sources
HAR 11-60.1-113 Application Fees for Covered Sources
HAR 11-60.1-114 Annual Fees for Covered Sources
HAR 11-60.1-115 Basis of Annual Fees for Covered Sources
Subchapter 9 Hazardous Air Pollutant Sources

Federal Requirements
40 CFR Part 63 - National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technologies (MACT) Standards)
Subpart CC - National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries

Non-Applicable Requirements:

Hawaii Administrative Rules (HAR)
Title 11, Chapter 60.1 Air Pollution Control
Subchapter 7 Prevention of Significant Deterioration
Subchapter 8 Standards of Performance for Stationary Sources

Best Available Control Technology (BACT):

A Best Available Control Technology (BACT) analysis is applicable only to new covered sources and significant modifications to covered sources that have the potential to emit or a net emissions increase above significant levels as defined in HAR §11-60.1-1. A BACT analysis is not applicable since the there are no significant net emission increases.

Prevention of Significant Deterioration (PSD):

A PSD major modification is defined as a project at an existing major stationary source that will result in a significant emissions increase and a significant net emissions increase of any pollutant subject to regulations approved pursuant to the Clean Air Act as defined in 40 CFR §52.21. Since there are no significant emission increases for these modifications, PSD is not triggered.

Consolidated Emissions Reporting Rule (CERR):

40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines CER based on the emissions of criteria air pollutants from Type A and Type B point sources (as defined in 40 CFR Part 51, Subpart A), that emit at the CER triggering levels shown in the table below

CERR/In-House Reporting Applicability

Pollutant	Type A CER Triggering Levels [1,2] (tpy)	Type B CER Triggering Levels [1] (tpy)	Pollutant	In-house Total Facility Triggering Levels [3] (tpy)
NO_x	≥2500	≥100	NO_x	≥25
SO_x	≥2500	≥100	SO_x	≥25
CO	≥2500	≥1000	CO	≥250
$PM_{10}/PM_{2.5}$	≥250/250	≥100/100	PM/PM_{10}	≥25/25
VOC	≥250	≥100	VOC	≥25
			HAPS	≥5

[1]Based on actual emissions
[2]Type A sources are a subset of Type B sources and are the larger emitting sources by pollutant
[3]Based on potential emissions

There is no change from Covered Source Permit No. 0212-01-C. This Type A facility emits above the Type A CER and in-house triggering levels. Therefore, CER and annual emissions reporting requirements are applicable. Also, annual emissions reporting is required for covered sources.

Compliance Assurance Monitoring (CAM):

No change from Covered Source Permit No. 0212-01-C. This facility is not subject to CAM.

Synthetic Minor Source:

No change from Covered Source Permit No. 0212-01-C. This facility is not a synthetic minor.

Insignificant Activities:

No change from Covered Source Permit No. 0212-01-C.

Alternate Operating Scenarios:

Significant Modification Application No. 0212-37

Although the tank would be permitted to store gasoline and naphtha, the refinery wants to retain the flexibility and may continue to store distillates in Tank no. 503.

Project Emissions:

Minor Modification Application No. 0212-35

The emissions from Tank 605 were evaluated as an internal floating roof tank in gasoline service and as a vertical fixed roof tank in diesel service. The Potential to Emit (PTE) for each is summarized in the table below.

Tank 605			
Tank Type	**Service**	**Total VOC (lbs/yr)**	**HAP (lbs/yr)**
Internal Floating Roof	Gasoline 87	17,324	958
Vertical Fixed Roof	Diesel	6,647	453
Emission Reduction		10,677 [5.3 tpy]	505 [0.3 tpy]

EPA Tanks 4.0.9d program was used to calculate the emission rates for the tank. The permitted emission rate for tank 605 is based on calculations submitted in the February 2005 Title V permit application, (Appendix B, Tanks 4.0, PTE based on 2003) for Tank 605 as an internal floating roof tank in Gasoline 87 service.

The emission rate of Tank 605 as a vertical fixed roof tank was recalculated using the same tank throughput (68,052,233 gal/yr) and same number of turnovers (14.78) as used in the 2005 permit application, but this time in diesel service and without a floating roof. The true vapor pressure (0.022 psi) for diesel at 100°F, used in the Tank 4.09 program, was extracted from Table 7.1-2 of U.S. EPA AP-42. As indicated in the summary table above, VOC emissions are expected to decline by more than 60% by converting from an IFR in gasoline service to a VFR in diesel service.

Likewise on a PTE basis, HAP emissions are also expected to decline by more than 50%, because there is far less benzene, toluene, and n-hexane in diesel than there is in gasoline. As indicated in the Title V permit application, the HAPs content of gasoline was approximately forty-four (44) wt %, which is more than 100 times greater than the HAP content of the diesel (0.25 wt %). In fact, as indicated in the summary table above and the attached tanks 4.09 emissions estimate, HAPs emissions will be reduced, by more than 500 lbs/yr as a result of converting the tank to diesel service, even with the roof removed.

Minor Modification Application No. 0212-36

The emissions from Tank 517 were evaluated with the tank containing jet kerosene and compared against the original 1996 permit application emission estimate with the tank in asphalt service. The total VOC and HAP emissions are summarized below:

Tank 517	Total VOC (lbs/yr)	HAP (lb/yr)
Asphalt Service 1996 Permit Application	78	
Spent Caustic with Jet Kerosene Layer (PTE w/ 20 Turnovers)	901	272

Note: Although initially permitted for asphalt, Tank 517 remained empty and asphalt was never stored in the tank. Consequently, the emissions estimate above for asphalt is strickly a PTE.

In the 1996 permit application, EPA Tanks 2.0 program was used to calculate the emission rates for the tank while in asphalt service. In this application EPA Tanks 4.0.9d program was used to calculate the emissions from hydrocarbon layer that has accumulated on top of the spent caustic.

The emission rate of Tank 517 with a jet kerosene hydrocarbon was recalculated using the same tank throughput and same number of turnovers twenty (20) as presumed in the 1996 permit application. This is conservative because historically over the past five (5) years while in spent caustic service, Tk-517 has operated with less than 10 turnovers per year. The true vapor pressure (0.029 psi) for jet kerosene at 100 °F, used in the Tank 4.09 program, was extracted from Table 7.1-2 of U.S. EPA AP-42. The HAP speciation data was based on over ten (10) lab results, conducted by a Core Lab, from sampling various jet and kerosene streams throughout the refinery (although not this tank in particular). As indicated in the summary table above, even under the most conservative (actual to potential) estimate, VOC and HAP emissions are projected to be approximately one half of the respective minor permit thresholds (VOC 2000 lb/yr and HAP 500 lb/yr).

Significant Modification Application No. 0212-37

Tank no. 503 was retrofitted with a mechanical shoe primary and rim-mounted secondary seal system in January 2009. Previously, the tank had been equipped with a foam log primary and weathershield secondary seal system, which was approved by the DOH as an insignificant activity.

As part of the prior (2008) application to upgrade to a mechanical shoe seal, EPA Tanks 4.0.9d program was used to calculate the emission rates for the tank. The tank 503 emission rate was based on 29.7 turnovers per year (in jet kerosene service), a TVP of 0.31 psia, and a HAPs content of 2.6 weight percent.

For this permit application, the same numbers of turnovers (29.7 per year) was used. To conservatively estimate the increase in emissions when the tank is used to store naphtha/gasoline, emissions were recalculated with a TVP of 7.5 psia and HAPs content of 46.1 weight percent (the highest 2011 TVP and HAPs content for refinery's naphtha/gasoline products). The emission rates are summarized in the table below:

Tank 503	TVP (psia)	Liquid HAP%	VOC (lb/yr)	HAP (lb/yr)
Jet Kerosene	0.31	2.6	2,505	71
Gasoline	7.5	46.1	38,777	1,898
Emission Increase			36,272 [18.1 tpy]	1,827 [0.9 tpy]

The projected increase in potential emissions exceeds the minor permit threshold of 500 lbs of HAPS and two (2) tons of VOC specified in HAR §11-60.1-81, therefore, the conversion to a gasoline/naphtha tank is considered a significant modification.

Ambient Air Quality Assessment:

The only emissions are fugitive VOCs from the petroleum storage tanks and any HAPs associated with these VOCs. An ambient air quality impact assessment was not performed for the following reasons: 1) VOCs do not have an ambient air quality standard, and 2) the Department of Health air modeling guidance generally exempts an applicant from performing an ambient air quality impact assessment for fugitive sources (storage tanks, pipe leaks, etc.).

Significant Permit Conditions:

Proposed additions are underlined and proposed deletions are struck through.

Attachment II(M) Section A.- Equipment Description will be revised as follows:

1. This portion of the Covered Source Permit encompasses the following equipment and associated appurtenances:

    a. Seven (7) ~~Eight (8)~~ Crude Oil Storage Tanks

        i. One (1) - 9,868,877 gallon (nominal) external floating roof storage tank identified as Tank 101;
        ii. Five (5) ~~Four (4)~~ - 13,989,087 gallon (nominal) external floating roof storage tanks identified as Tanks 102, 103, 104, 105, and 106;
        iii. One (1) ~~Two (2)~~ - 18,298,590 gallon (nominal) external floating roof storage tank~~s~~ identified as Tank~~s~~ 107 ~~and 108;~~
        ~~iv. One (1) 16,140,316 gallon (nominal) external floating roof storage tank identified as Tank 102.~~

    b. Seven (7) Recovered Oil/Wastewater Storage Tanks

        i. One (1) - 1,107,535 gallon (nominal) internal floating roof storage tank identified as Tank 109;
        ii. One (1) - 2,650,792 gallon (nominal) internal floating roof storage tank identified as Tank 111;
        iii. One (1) - 2,283,940 gallon (nominal) external floating roof storage tank identified as Tank 902;
        iv. One (1) - 302,234 gallon (nominal) external floating roof storage tank identified as Wastewater Equalization Tank 3520;
        v. One (1) - 509,305 gallon (nominal) external floating roof storage tank identified as Recovered Oil Tank 3522;

vi. One (1) - 616,805 gallon (nominal) external floating roof storage tank identified as Wastewater Equalization Tank 3526.
vii. One (1) - 1,107,535 gallon (nominal) external floating roof storage tank identified as Tank 110.

c. Fifteen (15) Naphtha/Gasoline Storage Tanks

i. Four (4) - 1,015,085 gallon (nominal) external floating roof storage tanks identified as Tanks 201, 202, 203 and 204;
ii. Two (2) - 3,289,626 gallon (nominal) external floating roof storage tanks identified as Tanks 405 and 509;
iii. One (1) - 2,134,215 gallon (nominal) external floating roof storage tank identified as Tank 406;
iv. Two (2) - 2,283,940 gallon (nominal) internal floating roof storage tanks identified as Tanks 407 and 408;
v. Three (3) ~~Two (2)~~ - 1,998,448 gallon (nominal) external floating roof storage tanks identified as Tanks 501**,** ~~and~~ 502, and 503;
vi. One (1) -5,296,298 gallon (nominal) internal floating roof storage tank identified as Tank 510;
~~vii. One (1) - 4,605,476 gallon (nominal) vertical fixed roof storage tank identified as Tank 605;~~
vii~~i~~. Two (2) - 3,095,209 gallon (nominal) internal floating roof storage tanks identified as Tanks 610 and 611.

d. Forty-Two (42) ~~Forty-One (41)~~ Heavy Oil Storage Tanks

i. One (1) - 2,650,792 gallon (nominal) vertical fixed roof storage tank identified as Tank 112;
ii. One (1) - 68,159 gallon (nominal) vertical fixed roof storage tank identified as Tank 200;
iii. Four (4) - 1,015,085 gallon (nominal) vertical fixed roof storage tanks identified as Tanks 205, 206, 301, and 302;
iv. Two (2) - 1,804,595 gallon (nominal) vertical fixed roof storage tanks identified as Tanks 207 and 303;
v. Two (2) - 2,141,194 gallon (nominal) vertical fixed roof storage tanks identified as Tanks 304 and 305;
vi. Five (5) - 4,605,476 gallon (nominal) vertical fixed roof storage tanks identified as Tanks 306, 307, 603, 606, and 607;
vii. One (1) - 455,942 gallon (nominal) vertical fixed roof storage tank identified as Tank 311;
viii. Two (2) - 1,804,595 gallon (nominal) external floating roof storage tanks identified as Tanks 401 and 402;
ix. Two (2) - 1,804,595 gallon (nominal) external floating roof storage tanks identified as Tanks 403 and 404;
x. One (1) ~~Two (2)~~ - 1,998,448 gallon (nominal) external floating roof storage tank~~s~~ identified as Tank~~s~~ ~~503 and~~ 504;
xi. Four (4) - 1,998,448 gallon (nominal) vertical fixed roof storage tanks identified as Tanks 505, 506, 507, and 508;
xii. One (1) - 5,526,571 gallon (nominal) internal floating roof storage tank identified as Tank 511;

xiii. One (1) - 5,168,496 gallon (nominal) vertical fixed roof storage tank identified as Tank 512;
xiv. One (1) – 1,265,848 gallon (nominal) vertical fixed roof storage tank identified as Tank 513;
xv. Two (2) - 2,968,887 gallon (nominal) vertical fixed roof storage tank identified as Tanks 514 and 515;
xvi. One (1) - 8,518 gallon (nominal) vertical fixed roof storage tank identified as Tank 516;
xvii. Two (2) - 2,141,194 gallon (nominal) vertical fixed roof storage tanks identified as Tanks 601 and 602;
xviii. One (1) - 4,605,476 gallon (nominal) internal floating roof storage tank identified as Tank 604;
xix. Two (2) - 4,856,228 gallon (nominal) internal floating roof storage tanks identified as Tanks 608 and 609;
xx. Two (2) - 22,557 gallon (nominal) vertical fixed roof storage tanks identified as Tanks 903 and 905;
xxi. One (1) - 117,487 gallon (nominal) vertical fixed roof storage tank identified as Tank 1103; ~~and~~
xxii. One (1) - 230,274 gallon (nominal) internal floating roof storage tank identified as Tank 2301;
xxiii. One (1) – 4,605,476 gallon (nominal) vertical fixed roof storage tank identified as Tank 605; and
xxiv. One (1) – 474,024 gallon (nominal) vertical fixed roof storage tank identified as Tank 517.

Attachment II(M) Special Condition No. C.4 will be revised as follows:

4. The petroleum storage tanks identified in Special Condition No. A.1.d of this Attachment (except for petroleum storage tanks 903 and 905) shall only store petroleum liquids with a true vapor pressure of 1.5 psia or less. Tank 605 shall only store petroleum liquids with a liquid HAP content of 0.5% by weight or less. Jet or kerosene shall not be stored in Tank 605.

Conclusion and Recommendations:

Recommend issuance of the two minor modifications and the significant modification to existing Covered Source Permit No. 0212-01-C based on the significant permit conditions shown above. Compliance with all State and Federal regulations will be maintained. A thirty-day (30-day) public comment period and a forty-five-day (45-day) EPA review period are also required before issuance of the permit modification.

Reviewer: Darin Lum
Date: 1/2013