

Significant Modification to Covered Source Permit No. 0249-02-C Review
Application No. 0249-08

Applicant: Maui Pineapple Company, Ltd.

Equipment Description:

For this modification all existing boilers and diesel engine generators will be removed:

<u>Unit No.</u>	<u>Description</u>
1,2	Two (2) 1305 kW diesel engine generators, 1989 Wartsila Vasa 4R32 (max. fuel input 82.6 gph);
3,4	Two (2) 1970 kW diesel engine generators, 1989 Wartsila Vasa 6R32 (max. fuel input 123.4 gph);
5	One (1) 28,000 lb/hr boiler, 1954 Foster Wheeler Model B-3313 (max. heat input 36.7 MMBtu/hr);
6,7,8	Three (3) 40,000 lb/hr boiler, 1979 Cleaver Brooks Model DL-52E (max. heat input 47.496 MMBtu/hr)

The following boiler (with no add-on pollution control) will be added and the only equipment permitted:

One (1) 500 HP Hurst boiler (model no. S5-A2-500-150, serial no. to be provided when installed, 140 gal/hr max. fuel consumption, 19.6 MMBtu/hr, and 17,250 lb/hr steam)

Check: 140 gal/hr x 0.140 MMBtu/gal = 19.6 MMBtu/hr which is approximately half of the 47.496 MMBtu/hr boilers mentioned above. This ratio matches the steam output ratio (17,250 lb/hr vs. 40,000 lb/hr)

Equipment Location:

Maui Pineapple Cannery
120 Kane Street, Kahului, Maui, HI 96732
UTM Coordinates: Zone 4, 762,637m E, 2,311,552m N (NAD-83)

Responsible Official:

Gerard J. Watts
Vice President of Operations
(808) 877-3818

Point of Contact:

Mel Hipolito, Jr
Maintenance Superintendent
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Mailing Address:

No change from previous review.

Consultant:

Jim Morrow
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Proposed Project:

Maui Pineapple Company (MPC) will continue to own and operate a pineapple cannery. Since all the diesel engine generators will be removed, electric power will no longer be generated at the facility. Therefore, the Standard Industrial Classification Code (SICC) is 2033 - Canned Fruits, Vegetables, Preserves, Jams, and Jellies.

MPC is proposing to add 'Unitek diesel' as another fuel option for the new boiler. Fuel oil no. 2, Jet-A, specification (spec) used oil, and cooking oil will be permitted as previously allowed. There will be a significant decrease in potential emissions. However, this change is considered a significant modification because of the significant changes to the permit conditions. Even though PSD no longer applies to this facility, the new boiler is subject to NSPS Subpart Dc (see the **Applicable Requirements** section below).

This review for a Significant Modification to a Covered Source is based on the application dated December 14, 2005 and its revisions dated January 26, 2006. The application fee of \$500.00 (checks for \$100.00 + \$400.00) for a Significant Modification to a Nonmajor, Non-toxic Covered Source will be processed and receipt submitted with the permit.

Applicable Requirements:

- Hawaii Administrative Rules (HAR) Chapter 11-59
- Hawaii Administrative Rules (HAR) Chapter 11-60.1
 - Subchapter 1 - General Requirements
 - Subchapter 2 - General Prohibitions
 - 11-60.1-31 Applicability
 - 11-60.1-32 Visible Emissions
 - 11-60.1-38 Sulfur Oxides from Fuel Combustion
 - Subchapter 5 - Covered Sources
 - Subchapter 6 - Fees for Covered Sources
 - 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
 - Subchapter 8, Standards of Performance for Stationary Sources

Code of Federal Regulations (CFR)

- 40 CFR Part 60 - New Source Performance Standard (NSPS)
 - Subpart A - General Provisions
 - Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units because it will commence construction after June 9, 1989 and have a maximum design heat input capacity less than 100 MMBtu/hr and greater than 10 MMBtu/hr.

Non-Applicable Requirements:

40 CFR Part 52.21 - Prevention of Significant Deterioration (PSD) of Air Quality is no longer applicable to the diesel engine generators since they will be removed. PSD No. HI 87-02 will be closed upon this permit's issuance. A new PSD review is not applicable because this facility will not be a major stationary source.

Code of Federal Regulations (CFR)

40 CFR Part 61 - National Emission Standard for Hazardous Air Pollutants (NESHAPS) is not applicable since there is no regulation for the boiler.

40 CFR Part 63 - Maximum Achievable Control Technology (MACT) is not applicable since the facility is not a major source of hazardous air pollutants (HAPS) emissions (≥ 10 tpy of individual or 25 tpy of a combination of HAPS).

Consolidated Emissions Reporting Rule (CERR) is not applicable because air pollutant emissions from the facility are less than reporting levels pursuant to 40 CFR 51, Subpart A (see **Table 1**).

Table 1 - CERR

Pollutant	Facility Emissions (tpy)	CERR Triggering Levels (tpy)		Internal Reporting Threshold (tpy)
		1-yr Reporting Cycle (Type A Sources)	3-yr Reporting Cycle (Type B Sources)	
VOC	0.68	≥ 250	≥ 100	≥ 25
PM	13.69	n/a	n/a	≥ 25
PM ₁₀	11.19	≥ 250	≥ 100	≥ 25
PM _{2.5}	11.19	≥ 250	≥ 100	≥ 25
NO _x	12.54	$\geq 2,500$	≥ 100	≥ 25
SO _x	28.30	$\geq 2,500$	≥ 100	≥ 25
CO	6.31	$\geq 2,500$	$\geq 1,000$	≥ 250
HAPs (total)	2.24e-01	n/a	n/a	≥ 5

Note: The facility emissions are taken from **TABLE 2** for the continuous (8,760 hr/yr) operation of the boiler.

Also, the DOH's internal policy is to sum the individual emissions sources and if the sum of an individual pollutant exceeds the threshold limits, then annual emissions reporting is required. Internal reporting also does not apply as shown in **Table 1**. However, the internal policy for all covered sources is to submit annual emissions reports to the DOH.

Compliance Assurance Monitoring (CAM) is to provide a 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 [>100 tpy]; and (5) not otherwise be exempt from CAM. CAM is not applicable since items 1, 3, and 4 do not apply.

Synthetic Minor is a facility with operational limitations in order to keep potential emissions lower than major source levels (≥ 100 tpy of criteria pollutants or ≥ 10 tpy of individual or 25 tpy of a combination of HAPs). This facility would not be a major source if it were to operate continuously (8,760 hr/yr), therefore, synthetic minor does not apply (see **Table 2**).

A Best Available Control Technology (BACT) analysis is required for new sources or modifications to existing sources that would result in a net significant emissions increase as defined in HAR, Section 11-60.1-1. As shown in the **Project Emissions** section, this is a new source with no significant increase in emissions, therefore a BACT review does not apply.

Insignificant Activities/Exemptions:

No change from previous review.

Alternative Operating Scenarios:

No change from previous review.

Project Emissions:

The proposed modification will significantly decrease the maximum potential facility emissions except for PM. Therefore, a comparison (netting evaluation) was conducted between the average of the actual emissions from the previous two years and the new potential. The previous two years used were 2003 and 2004 since the annual emissions report for 2005 have not been submitted yet. This comparison of emissions (shown in **Table 3**) can be used to claim creditable emission decreases for future modifications made within the contemporaneous period (5 yrs before construction is expected to commence and ending when the emission increase occurs).

The new potential facility emissions (shown in **Table 2**) were calculated for the 500 HP boiler using the proposed fuel limitations: 770,000 gal/yr of the combined total of fuel oil no. 2, Jet-A spec used oil, and Unitek diesel; and/or continuous (1,387,000 gal/yr) use of cooking oil. A previous permit review for MPC showed that emissions from fuel oil no. 2 \geq Jet-A. Also, a previous permit review for Unitek (Application No. 0395-03 for Permit No. 0395-01-N), determined that the combustion of Unitek diesel will not cause any significant increase in emissions. Therefore, this review will assume that emissions from spec used oil \geq Unitek diesel.

The emission factors were taken from US EPA AP-42 emission factors and source performance tests. See Appendix A of the application for details and emission calculations for continuous operation (8.760 hrs/yr). Certain HAPs were calculated by the Department of Health using the permit limits for spec used oil.

Table 2 - Maximum Potential Facility Emissions

Pollutant	Fuel w/ Largest Emission Factor			Total Worst Case Scenario ¹ (tpy)	Significant Levels (tpy)
	Cooking Oil (tpy)	F.O. 2 / Jet-A (tpy)	Spec Oil / Unitek (tpy)		
SO ₂ ²	0.00		28.30	28.30	≥40
NO _x	12.54			12.54	≥40
CO	6.31			6.31	≥100
PM	1.37		12.32	13.69	≥25
PM ₁₀ /PM _{2.5} ³	1.37		9.82	11.19	≥15
VOC	0.29		0.39	0.68	≥40
Formaldehyde	n/a	2.35e-02		2.35e-02	
Phenol	n/a		9.24e-04	9.24e-04	
Dichlorobenzene	n/a		3.08e-07	3.08e-07	
Naphthalene	n/a		5.01e-03	5.01e-03	
Phenanathrene/anthracene	n/a		4.24e-03	4.24e-03	
Butylbenzylphthalate	n/a		1.96e-04	1.96e-04	
Bis(2-ethylhexyl) phalate	n/a		8.47e-04	8.47e-04	
Pyrene	n/a		2.73e-02	2.73e-02	
Benz(a)anthracene/chrysen	n/a		1.54e-03	1.54e-03	
Benzo(a)pyrene	n/a		1.54e-03	1.54e-03	
As ⁴	n/a		1.36e-02	1.36e-02	
Be ⁵	n/a		3.39e-04	3.39e-04	≥0.0004
Cd ⁶	n/a		5.43e-03	5.43e-03	
Cr ⁷	n/a		2.71e-02	2.71e-02	
Pb ⁸	n/a		8.14e-02	8.14e-02	≥0.6
Mn	n/a		2.62e-02	2.62e-02	
Hg	n/a	1.62e-04		1.62e-04	≥0.1
Ni	n/a		4.24e-03	4.24e-03	
Se	n/a	8.09e-04		8.09e-04	
			Total HAPs:	2.24e-01	

Notes:

- The worst case scenario is the total of the emissions using the fuel(s) with the greatest emission factors. Continuous (1,387,000 gal) use of cooking oil was used for CO and NO_x, while 770,000 gal of fuel oil + 617,000 gal of cooking oil were used the other pollutants. It is assumed that cooking oil will have insignificant emissions of HAPs.
- 28.3 tpy x 140 gal/hr x 8,760 hr/yr / 770,000 gal/yr = 45 tpy, which is less than 100 tpy, therefore this facility is not a synthetic minor.
- It assumed that PM₁₀ = PM_{2.5} which is conservative.
- As calc: 5 ppm permit limit x 770,000 gal/yr x 7.05 lb/gal x 1ton/2,000 lbs = 1.36e-2 tpy
- Be calc: 0.125 ppm permit limit x 770,000 gal/yr x 7.05 lb/gal x 1ton/2,000 lbs = 3.39e-04 tpy
- Cd calc: 2 ppm permit limit x 770,000 gal/yr x 7.05 lb/gal x 1ton/2,000 lbs = 5.43e-03 tpy
- Cr calc: 10 ppm permit limit x 770,000 gal/yr x 7.05 lb/gal x 1ton/2,000 lbs = 2.71e-02 tpy
- Pb calc: 30 ppm permit limit x 770,000 gal/yr x 7.05 lb/gal x 1ton/2,000 lbs = 8.14e-02 tpy

Table 3
Net Emissions

Pollutant	Previous Actual Emissions (tpy)			New Potential Emissions (tpy)	Net ¹ (+/-) (tpy)	Significant Increase (tpy)
	2003	2004	2 Yr Average			
SO ₂	41.82	31.70	36.76	28.30	-8.46	≥40
NO _x	142.97	76.20	109.59	12.54	-97.05	≥40
CO	69.48	36.20	52.84	6.31	-46.53	≥100
PM	26.52	20.00	23.26	13.69	-9.57	≥25
PM ₁₀ /PM _{2.5}	22.66	17.12	19.89	11.19	-8.70	≥15
VOC	7.16	3.70	5.43	0.68	-4.75	≥40
HAPs ²	n/a	n/a	n/a	n/a	n/a	n/a

Note:

1. Net is the difference of the new potential minus the previous 2-yr average.
 Example Calc: 12.54 tpy - 109.59 tpy = -97.05 tpy NO_x.
2. HAPs emissions are insignificant and are not reported in the annual emissions reports.

Air Quality Assessment:

An ambient air quality analysis (AAQA) was conducted for the new boiler to ensure compliance with state and national ambient air quality standards (SAAQS and NAAQS). The model (Bee-Line ISCST3 "BEEST" version 7.10), methodology and assumptions employed in the AAQA have been determined to be consistent with State and Federal guidelines and are discussed below.

The model included regulatory default options and rural dispersion parameters.

A digital elevation model (DEM) file of the vicinity was used to generate elevations at discrete cartesian coordinates. The receptors were spaced 30 meters apart (outside the fence line where the public has access) and the elevations were shown in meters. A total of 1,468 receptors were created.

Preprocessed meteorological data was used for input into the model. Since there was no recent meteorological data for Maui that was processed and approved by the Department, SCREEN2.ASC data dated 1999 was used. This data does not cover a full year, therefore only one hour concentrations were calculated by the model. State and EPA scaling factors to determine the concentrations for the respective averaging periods were used. This is conservative since the highest one hour concentrations were used for all averaging periods.

The MPC building which houses the canning operation (including the new boiler) and Macy's were considered for downwash effects. An EPA Building Profile Input Program (BPIP) file was created using these building locations and dimensions to calculate downwash.

PROPOSED
Reviewed by: CS
 April 18, 2006

Table 4 presents the proposed potential to emit emission rates and stack parameters of the boiler used in the AAQA. The derivation of SO₂, NO_x, CO, and PM₁₀ emission rates were previously discussed in the **Project Emissions** section.

The predicted concentrations presented in **Table 5** show the worst case scenario when any of the allowed fuel is used. The annual concentrations include the permitted fuel limitations. NO_x was assumed to equal NO₂ concentrations for the worst case scenario (using cooking oil). Based on these assumptions, the facility shows compliance with SAAQS and NAAQS for SO₂, NO₂, CO, and PM₁₀. No results were provided for Pb and H₂S because it was assumed to be negligible.

Table 4
Source Emission Rates and Stack Parameters

Source		Emission Rates ¹					Stack Parameters			
Equipment	Stack No.	SO ₂ (g/s)	NO _x (g/s)	CO (g/s)	PM ₁₀ (g/s)	Pb (g/s)	Height (m)	Temp. (K)	Velocity (m/s)	Diameter (m)
Boiler w/ fuel oil no. 2	1	1.00e+00	3.53e-01	8.82e-02	1.76e-02	--	17.07	543.15	13.69	0.61
Boiler w/ spec used oil	1	1.30e+00	3.35e-01	8.82e-02	4.50e-01	--	17.07	543.15	13.69	0.61
Boiler w/ cooking oil	1	2.47e-04	3.60e-01	1.81e-01	8.90e-02	--	17.07	543.15	13.69	0.61

Note:

- All emission rates were used in the model (numbers in **bold** were the worst case scenario). Although the NO_x emission factor for cooking oil was the smaller of the fuels, it was assumed to have the greatest hourly emission since it would take more cooking oil to match the heat input from other fuels (158.3 gal/hr vs 140 gal/hr). Continuous use of cooking oil was the worst case scenario for NO_x and CO emissions. 770,000 gal/yr of fuel oil + 617,000 gal/yr of cooking oil was the worst case scenario for SO₂ and PM₁₀.

Table 5
Predicted Ambient Air Quality Impacts

Air Pollutant	Averaging Time ¹	Impact (µg/m ³)	Background ² (µg/m ³)	Total Impact (µg/m ³)	Air Standard (µg/m ³)	Percent Standard	Impact Location (m,m) ³
SO ₂	3-Hour	532.00	17	549	1300	42%	762622, 2311448
	24-Hour	236.00	7	243	365	67%	762622, 2311448
	Annual ⁵	74.21	1	75	80	94%	762622, 2311448
NO ₂	Annual ^{4,5}	24.60	9	34	70	48%	762622, 2311448
CO	1-Hour	83.00	2394	2477	10000	25%	762622, 2311448
	8-Hour	58.00	983	1041	5000	21%	762622, 2311448
PM ₁₀	24-Hour	82.00	65	147	150	98%	762622, 2311448
	Annual ⁵	29.30	19	48	50	97%	762622, 2311448
Pb	Calendar Quarter	--	--	--	1.5	--	--
H ₂ S	1-Hour ⁵	--	--	--	35	--	--

Note:

1. State and EPA scaling factors were multiplied with the one hour concentrations for the respective averaging periods (0.9 for 3-hr; 0.7 for 8-hr; 0.4 for 24-hr; and 0.2 for annual).
2. The background concentrations were taken from Hawaii Air Quality Data 2004 at Kihei for PM₁₀ and Kapolei, Oahu for all other pollutants.
3. (m,m) = Location (UTM coordinates) meters east, meters north.
4. Annual emissions also include permitted fuel limitations for SO₂ and PM₁₀. Fuel oil concentrations already include 770,000 gal/yr factor. Therefore, need to factor in the remaining fuel potential with cooking oil: 770,000 gal/yr / 1,387,000 gal/yr = 0.5552.
 Example calcs: 74.2 µg/m³ + 0.022 µg/m³ x (1-0.5552) = 74.2 µg/m³ SO₂
 25.7 µg/m³ + 8.1 µg/m³ x (1-0.5552) = 29.3 µg/m³ PM₁₀
5. NO₂ = 0.75 x NO_x concentrations.
6. Pb and H₂S emissions were assumed to be negligible.

Other Issues:

The application proposed a permit limit of 1,387,000 gallons for the combined total of any fuel (including cooking oil). However, as shown in the **Project Emissions** section, the calculated potential emissions included the worst case scenario of using the maximum permitted 770,000 gal/yr of fuel oils and/or cooking oil for the remainder of the year. These potential emissions did not trigger any different requirements. Therefore, cooking oil is not limited.

Significant Existing Permit Conditions:

Deleted most of the requirements except for the following:

1. Keep permitted fuels;
2. Keep alternate operating scenarios for switching fuels and equipment.

Significant New Permit Conditions:

1. Maximum 770,000 gallons for the combined total of fuel oil no. 2, Jet-A, Unitek diesel, and spec used oil in any rolling 12-month period (so potential emissions are below significant levels and concentrations are below SAAQS).
2. A non-resettable fuel meter shall be installed to monitor the total fuel consumption for the boiler (to accurately monitor fuel use).
3. 20% opacity for the new boiler (as required by HAR).
4. Update spec used oil and cooking oil conditions.
5. NSPS Subpart Dc compliance/monitoring requirements for using fuel oil no. 2: 0.5% sulfur by weight maximum and supplier certifications. All other requirements do not apply since the boiler does not use coal.

Conclusion and Recommendation:

In conclusion, it is the Department of Health's preliminary determination that the facility will comply with all State and Federal laws, rules, regulations, and standards with regards to air pollution. This determination is based on the application submitted by MPC. Therefore, a significant modification to a covered source permit for MPC subject to the above permit conditions, 30-day public notice period, and 45-day EPA review is recommended.