PROPOSED

TEMPORARY COVERED SOURCE PERMIT (CSP) REVIEW - 0612-01-CT (NEW)

Application No. 0612-01

Facility: Kiewit Pacific Co.
Located at Kawaihae, Big Island, Hawaii
UTM Coordinates 204,350 E / 2,217,300 N

Applicant: Kiewit Pacific Co.

Responsible Official: Mr. Steve R. Preedy
Vice President
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Mailing Address: Kiewit Pacific Co.
2200 Columbia House Blvd.
Vancouver, WA 98661

Equipment: 400 TPH CMI Asphalt Plant with 1,807 hp Caterpillar 3512 diesel engine generator
CMI Drum-Mixer, Model WJ-100, with Flametec Whisper Jet WJ-OLP Burner
Baghouse servicing Drum-Mixer
15.97 gal/hr Hot Oil Heater, HEATEC Model HC-200
Aggregate Bins
Scalping Screen
Asphalt Storage Silo
Various Conveyor Belts

Air Pollution Control: A baghouse will be used to capture particulate matter (PM) when the aggregate is being heated and processed inside of the hot drum. This baghouse is required to ensure that the NSPS Subpart I emission limit is not exceeded.

Background:

The applicant submitted their initial application for a new covered source permit on December 16, 2005, for the operation of an asphalt plant. The application filing fee of $1,000.00 was also received with the initial permit application. Additional information was received January 24, 2006. An addendum to the application was submitted on March 2, 2006 to include the hot oil heater in the air quality modeling, eliminate spec used oil proposal, and revise limit of the diesel engine generator from a hour to gallonage restriction. A fax was submitted May 11, 2006 to revise the fuel restriction for the diesel engine generator from 185,536 to 140,000 gal/yr.

The plant produces asphalt concrete (SICC 1611 for paving). Aggregate is fed into the drum mixer where a burner is used to heat and dry the aggregate. Asphalt oil is then added to the aggregate. A baghouse is used to control particulate emissions, which are captured and recycled back into the drum mixer. The hot mix asphalt is discharged onto a conveyor and transferred to storage silos.

The proposed limits for the facility are 600,000 ton/yr asphalt concrete production and 140,000 gal/yr fuel oil no. 2 consumption for the diesel engine generator. Due to these limits, the NO_x significant level and NO_2 state ambient air quality standard (SAAQS) would not be exceeded.

Applicable Requirements:

Hawaii Administrative Rules (HAR)
- Title 11, Chapter 59, ambient Air Quality Standards
- Title 11, Chapter 60, Air Pollution Control
  - Subchapter 1 - General Requirements
  - Subchapter 2 - General Prohibitions
    - 11-60.1.31 Applicability
    - 11-60.1.32 Visible Emissions
    - 11-60.1.33 Fugitive Emissions
    - 11-60.1.37 Process Industries
    - 11-60.1-38 Sulfur Oxides from Fuel Combustion
  - Subchapter 5 - Covered Sources
  - Subchapter 6 - Fees for Covered Sources, Noncovered Sources, and Agriculture Burning
    - 11-60.1.111 Definition
    - 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
    - 11-60.1-161(9) Standards of Performance for Asphalt Concrete Plants
  - Subchapter 10 - Field Citations

New Source Performance Standards (NSPS), 40 CFR, Part 60:
Subpart A - General Provisions
Subpart I - Standards of Performance for Hot Mix Asphalt Facilities

Compliance Data System (CDS):
Facility is a covered source. The facility will be included in an inventory system for annual inspection.

Best Available Control Technology (BACT):
BACT analysis is required for new covered sources and significant modifications to covered sources that have the potential to emit or increase emissions above significant levels, as defined in HAR 11-60.1-1, considering any limitations, enforceable by the Director, on the covered source to emit a pollutant. BACT determination includes all fugitive emissions (except for vehicle traffic emissions, which is included if the definition of “major” requires the consideration of fugitives in calculating potential emissions for major source determination). For this facility, NSPS (CAA Section 111) is applicable and therefore vehicle emissions (PM emissions from unpaved roads) are included per *11-60.1-1 Definitions* for a “major source” (AA). Table 1 shows TSP exceeds the respective significant level threshold and therefore, BACT is required specifically for TSP.

For TSP: (1) Use of low sulfur fuel oil (e.g., fuel oil no. 2) with low ash content and proper maintenance/operation of the diesel engine, hot oil heater and drum mixer
(2) Baghouse for the drum-mix
(3) Water spray/truck for fugitive emissions

Table 1 - Significant Level Trigger Levels

Pollutant	Facility Emissions, TPY	Significant Level, TPY
CO	42.17	100
NO_x	39.16	40
SO_2	8.74	40
TSP	29.53	25
PM_{10}	13.82	15
VOC	15.27	40
Pb	4.59 E-03	0.6

Synthetic Minor:
Emissions with controls equal to or greater than 100 TPY and reduced by operating restrictions (i.e., fuel limit, production limit) to below 100 TPY would trigger synthetic minor status. The facility is determined to be a synthetic minor based on potential emissions greater than 100 TPY (i.e., NO_x) with emissions less than 100 TPY as limited by the proposed fuel restrictions. Fugitive sources from the permitted equipment and stationary activities (e.g., storage piles) associated with the permitted equipment are also included in determining applicability.

Non-applicable Requirements:

Consolidated Emissions Reporting Rule (CERR):
40 CFR Part 51, Subpart A - Emissions Inventory Reporting Requirements, determines CER based on facility-wide emissions of each air pollutant at the CER triggering level(s). As shown in Table 2, CER is not applicable.

However, The Clean Air Branch requests annual emissions reporting from those facilities that have *facility-wide* (e.g., total of all emission points) emissions of a single criteria pollutant exceeding the “in-house” triggering level. NO_x and TSP trigger in-house reporting of annual emissions.

Table 2 - CERR/In-house Triggering Levels

Pollutant	Facility Emissions (TPY)	Annual Cycle, Type A Sources (TPY)	Three-Year Cycle, Type B Sources (TPY)	In-house Triggering Level (TPY)
SO_x	8.74	2,500	100	25
VOC	15.27	250	100	25
NO_x	39.16	2,500	100	25
CO	42.17	2,500	1,000	250
Pb	4.59 E-03	N/A	5	5
TSP	29.53	N/A	N/A	25
PM_{10}	13.82	250	100	25
$PM_{2.5}$	1.78	250	100	N/A
Ammonia	N/A	250	100	N/A

Compliance Assurance Monitoring (CAM), 40 CFR 64:
The purpose of CAM is to provide reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control equipment to meet an emissions limit or standard. Applicability of the CAM rule is determined on a pollutant specific basis for each affected emission unit. Each determination is based upon a series of evaluation criteria. For a source to be subject to CAM, each source 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 100% of the major source level; and (5) not otherwise be exempt from CAM. The facility is not a major source and thus, CAM is not applicable.

Prevention of Significant Deterioration (PSD):
Not a major stationary source (criteria air pollutant >= 100 for listed sources or >=250 TPY for all other sources).

National Emissions Standards for Hazardous Emission Pollutants (NESHAP):
Not a listed source under 40 CFR 61 or 63

Maximum Achievable Control Technology (MACT):
Total hazardous air pollutant (HAP) emissions are 7.99 TPY. Highest single HAP emission is 1.05 TPY (formaldehyde) from the hot oil heater. The thresholds for “major” status and MACT applicability is 10 and 25 TPY for single and total combined HAP emissions, respectively.

Insignificant Activities:

Basis for Insign. Activity	Description
HAR 11-60.1 - 39	30,000 gallon asphalt oil tank
HAR 11-60.1 - 82(f)(1)	12,000 and 16,000 diesel fuel tanks

Alternate Operating Scenarios:
Applicant proposes a temporary replacement diesel engine generator of same size or smaller with equal or lesser emissions if the permitted generator warrants a removal.

Project Emissions:
The proposed asphalt production limit is 600,000 ton/yr. The diesel engine generator provides power to the asphalt plant as well as support facilities (i.e., buildings, etc.); a 140,000 gal/yr restriction is proposed. Specification used oil will not be burned at the facility. Emissions based on 8,760 hr/yr operation are shown in parenthesis.

Table 3 - 400 TPH Drum Mix Asphalt Plant (Criteria and Metal Emissions)

Pollutant	F.O. # 2		Specification (Spec) Used Oil	
	[a]Emission Factor, lb/ton	Annual Emission, TPY	[a]Emission Factor, lb/ton	Annual Emission, TPY
NO_x (as NO_2)	0.055	[b]16.50 (96.36)	0.055	n/a
CO	0.13	39.00 (227.76)	0.13	n/a
SO_2	0.011	3.30 (19.27)	0.058	n/a
VOC	0.032	9.60 (56.06)	0.032	n/a
$PM_{2.5}$	[c,d]0.0029	0.87 (5.08)	[c,d]0.0029	n/a
PM_{10}	[c,d]0.023	6.90 (40.30)	[c,d]0.023	n/a
TSP	[c,d]0.033	9.90 (57.82)	[c,d]0.033	n/a
Metal Emissions (HAPs)				
Arsenic	5.6 E-07	1.68 E-04	SAME AS F.O. #2 => n/a	
Beryllium	0.0	0.0		
Cadmium	4.1 E-07	1.23 E-04		
Chromium	5.5 E-06	1.65 E-03		
Cobalt	2.6 E-08	7.80 E-06		
Chromium (+6)	4.5 E-07	1.35 E-04		
Lead	1.5 E-05	4.50 E-03		
Manganese	7.7 E-06	2.31 E-03		
Mercury	2.6 E-06	7.80 E-04		
Nickel	6.3 E-05	1.89 E-02		
Phosphorus	2.8 E-05	8.40 E-03		
Selenium	3.5 E-07	1.05 E-04		

Total 3.71 E-02

[a] AP-42, 3/04: Table 11.1-3 for PM_{10} , TSP
Table 11.1-7 for CO, NO_x, SO_2
Table 11.1-8 for VOC

Table 11.1-12 for Metal HAPs

[b] (600,000 ton/yr) x (0.055 lb/ton) x (ton/2000 lb) = 16.50 TPY

[c] Fabric filter, control efficiency incorporated in emission factor

[d] Footnote (g) of Table 11.1-3

Table 4 - 400 TPH Drum Mix Asphalt Plant (HAPs from F.O. #2)

Hazardous Air Pollutant	[a]Emission Factor, lb/ton	[b]Annual Emissions, TPY
NON-PAH		
Benzene	3.9 E-04	0.12
Ethylbenzene	2.4 E-04	7.20 E-02
Formaldehyde	3.1 E-03	0.93
Hexane	9.2 E-04	0.28
Iso-octane	4.0 E-05	1.20 E-02
Methyl chloroform	4.8 E-05	1.44 E-02
Toluene	2.9 E-03	0.87
Xylene	2.0 E-04	6.00 E-02
PAH		
2-Methylnaphthalene	1.7 E-04	5.10 E-02
Acenaphthene	1.4 E-06	4.20 E-04
Acenaphthylene	2.2 E-05	6.60 E-03
Anthracene	3.1 E-06	9.30 E-04
Benzo(a)anthracene	2.1 E-07	6.30 E-05
Benzo(a)pyrene	9.8 E-09	2.94 E-06
Benzo(b)fluoranthene	1.0 E-07	3.00 E-05
Benzo(e)pyrene	1.1 E-07	3.30 E-05
Benzo(g,h,i)perylene	4.0 E-08	1.20 E-05
Benzo(f)fluroranthene	4.1 E-08	1.23 E-05
Chrysene	1.8 E-07	5.40 E-05
Fluorathene	6.1 E-07	1.83 E-04
Fluorene	1.1 E-05	3.30 E-03
Indeno(1,2,3-cd)pyrene	7.0 E-09	2.10 E-06
Napthalene	6.5 E-04	0.20

Perylene	8.8 E-09	2.64 E-06
Phenanthrene	2.3 E-05	6.90 E-03
Pyrene	3.0 E-06	9.00 E-04
Total HAPs	8.7 E-03	2.61

[a] AP-42, Table 11.1-10 (3/04)
[b] 600,000 ton/yr production limit

Table 5 - Diesel Engine (Criteria)

Pollutant	[a]Emission Factor, g/bhp-hr	Annual Emission 140,000 gal/yr (8,760 hr/yr), TPY
SO_2	0.16	[b]0.50 (2.79)
NO_x	6.8	21.27 (118.67)
CO	0.66	2.06 (11.52)
TSP=PM_{10}/0.96	0.094	0.29 (1.64)
PM_{10}	0.09	0.28 (1.57)
$PM_{2.5}$=90%TSP	0.084	0.26 (1.47)
VOC	0.23	0.72 (4.01)

[a] Manufacturer's Specs
[b] (1,807 bhp) x (0.16 g/bhp-hr) x (1,570 hr/yr) x (2.205 E-03 lb/g) x (ton/2000 lb) = 0.50 TPY
Note: (140,000 gal/yr) x (hr / 89.2 gal) = 1,570 hr/yr

Table 6 - Diesel Engine (HAPs)

Hazardous Air Pollutant	[a]Emission Factor, lb/MMBtu	Annual Emissions , TPY
Benzene	7.76 E-04	[b]7.61 E-03
Toluene	2.81 E-04	2.75 E-03
Xylene	1.93 E-04	1.89 E-03
Propylene	2.79 E-03	2.74 E-02
Formaldehyde	7.89 E-05	7.73 E-04
Acetaldehyde	2.52 E-05	2.47 E-04
Acrolein	7.88 E-06	7.72 E-05
Naphthalene	1.30 E-04	1.27 E-03

[a] AP-42, Table 3.4-3 (10/96); Table 3.4-4 for Naphthalene Total: 2.87 E-02
[b] (89 gal/hr)(0.14 MMBtu/gal)(7.76 E-04 lb/MMBtu)(1,570 hr/yr)(ton/2,000 lb) = 7.61 E-03 TPY

Table 7 - Hot Oil heater (Criteria and Metal Emissions)

Pollutant	[a]Emission Factor, lb/kgal	Annual Emissions 8,760 hr/yr, TPY
NO_x (as NO_2)	20	[b]1.39
CO	5	0.35
SO_2	142s = 71	4.94
VOC	0.556	0.04
$PM_{2.5}$	0.83	0.06
PM_{10}	1.08	0.08
TSP	2	0.14
Arsenic	[c]5.6 E-04	3.90 E-05
Beryllium	4.2 E-04	2.92 E-05
Cadmium	4.2 E-04	2.92 E-05
Chromium	4.2 E-04	2.92 E-05
Lead	1.3 E-03	9.05 E-05
Mercury	4.2 E-04	2.92 E-05
Manganese	8.4 E-04	5.85 E-05
Nickel	4.2 E-04	2.92 E-05
Selenium	2.1 E-03	1.46 E-04

[a] AP-42 has no criteria pollutant specific factors for hot oil heaters. "Commercial" boiler (0.5 to 10 MMBtu/hr) is instead used to evaluate emissions:

AP-42, Table 1.3-1 for NO_x, CO, SO_2, and TSP
Table 1.3-7 for PM_{10}
Table 1.3-3 for VOC
Table 1.3-10 for metal HAPs

[b] (15.9 gal/hr) x (20 lb/kgal) x (8,760 hr/yr) x (ton/ 2000 lb) = 1.39 TPY

[c] (4 lb/10^{12} Btu) x (0.14 MMBtu/gal) = 0.56 lb/10^3 kgal = 5.6 E-04 lb/kgal

Table 8 - Hot Oil Heater (HAPs and Dioxins/Furans)

Hazardous Air Pollutant	[a]Emission Factor, lb/gal	Annual Emissions, TPY
Formaldehyde	3.5 E-06	[b]2.44 E-04
Acenaphthene	5.3 E-07	3.69 E-05
Acenaphthylene	2.0 E-07	1.39 E-05
Anthracene	1.8 E-07	1.25 E-05
Benzo(b)fluoranthene	1.0 E-07	6.96 E-06
Fluoranthene	4.4 E-08	3.06 E-06
Fluorene	3.2 E-08	2.23 E-06
Naphthalene	1.7 E-05	1.18 E-03
Phenanthrene	4.9 E-06	3.41 E-04
Pyrene	3.2 E-08	2.23 E-06
Dioxins	2.0 E-10	1.39 E-08
Furans	3.1 E-11	2.16 E-09

[a] AP-42, Table 11.1-13 (3/04)

[b] (15.9 gal/hr) x (3.5 E-06 lb/gal) x (8,760 hr/yr) x (ton/2,000 lb) = 2.44 E-04 TPY

Storage Piles

AP-42, Equation 1 (1/95): E, lb/ton = (k) x (0.0032) x [$(U/5)^{1.3}$ / $(M/2)^{1.4}$] emission factor
U = 15 mph (AP-42, Section 13.2.4, highest value in range)
M = 1.77 (AP-42, Table 11.12-2, footnote b)

aggregate storage pile: assume aggregate 95% of production weight, 5% asphalt
600,000 TPY x 0.95 = 570,000 TPY

PM_{10}: E_{agg} = (0.35) x (0.0032) x [$(15/5)^{1.3}$ / $(1.77/2)^{1.4}$] = 5.54 E-03 lb/ton
(5.54 E -03 lb/ton) x (570,000 ton/yr) x (ton/2000 lb) x (1-70%) = 0.47 TPY, water truck 70% control efficiency

TSP: k = 0.74, E_{agg} = 1.17 E-02
(1.17 E-02) x (570,000) x (1 / 2000) x (1-70%) = 1.00 TPY

$PM_{2.5}$: k = 0.11, E_{agg} = 1.74 E-03
(1.74 E-03) x (570,000) x (1 / 2000) x (1-70%) = 0.15 TPY

Vehicle Emissions (Unpaved Roads)

AP-42, Section 13.2.2, Equation 1a and 2, Table 13.2.2-2 (revision 12/03)

E, lb/VMT = k $(s/12)^a$ $(W/3)^b$ [(365 - P) / P]

Constant	$PM_{2.5}$	PM_{10}	TSP
k (lb/VMT)	0.23	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45

s = 3.8% silt content
W = 26 tons mean vehicle weight
P = no. of "wet" days with at least 0.01 inches of precipitation for a year = 191
(www.wrcc.dri.edu)

Trucks VMT/yr: 1 mi. round trip
amount of crushed rock = 570,000 ton/yr
truck load capacity = 20 tons
no. of truck loads = no. of trips on road = 570,000 / 20 = 28,500 trips
trucks VMT/yr = 1 x 28,500 = 28,500 mi/yr

$PM_{2.5}$: $E = 0.23(3.8/12)^{0.9}(26/3)^{0.45}[(365 - 191) / 365] = 0.10$ lb/VMT
(0.10 lb/VMT) x (28,500 mi/yr) x (1 - 70%) x (ton/2,000 lb) = 0.44 TPY
70% control efficiency for water truck

PM_{10}: $E = 1.5 (3.8/12)^{0.9}(26/3)^{0.45}[(365 - 191) / 365] = 0.67$ lb/VMT
(0.67 lb/VMT) x (28,500 mi/yr) x (1 - 70%) x (ton/2,000 lb) = 2.87 TPY

TSP: $E = 4.9 (3.8/12)^{0.7}(26/3)^{0.45}[(365 - 191) / 365] = 2.76$ lb/VMT
(2.76 lb/VMT) x (28,500 mi/yr) x (1 -70%) x (ton/2,000 lb) = 11.80 TPY

Table 9 - Aggregate Handling

	[a]Emission Factor, lb/ton			Annual Emissions, TPY		
Process	$PM_{2.5}$	PM_{10}	TSP	$PM_{2.5}$	PM_{10}	TSP
Truck unloading to storage bin	4.71 E-06	1.6 E-05	3.14 E-05	[b]0.0013	0.0046	0.0089
Storage bin to conveyor	0.0005	0.0011	0.0030	0.1283	0.3135	0.8550
Conveyor to Scalping Screen	0.0005	0.0011	0.0030	0.1283	0.3135	0.8550
Scalping Screen	0.0038	0.0087	0.025	1.0830	2.4795	7.125
Scalping Screen to conveyor	0.0005	0.0011	0.0030	0.1283	0.3135	0.8550
Conveyor to Drum Hopper	0.0005	0.0011	0.0030	0.1283	0.3135	0.8550
			Total	1.5975	3.7381	10.554

[a] AP-42, Table 11.19.2-2 (8/04); Appendix B.2, Table B.2.2, Category 3: $PM_{2.5}$ = 0.15 TSP, TSP = PM_{10} / 0.51

[b] assume aggregate 95% of production weight
(600,000 ton/yr) x (0.95) = 570,000 ton/yr
(570,000 ton/yr) x (4.71 E-06 lb/ton) x (ton/2000 lb) = 0.0013 TPY

[c] includes 70% control efficiency for water sprays

Table 10 - Loadout

Pollutant	[a]Emission Factor, lb/ton	Annual Emissions, TPY
Total PM	5.22 E-04	[b]0.16
Organic PM (HAPs)	3.41 E-04	0.10
TOC	4.16 E-03	1.25
CO	1.35 E-03	0.41

[a] AP-42, Table 11.1-14 (3/04)
V = - 0.5, T = 325° F default values per footnote a
EF_{PM} = 0.000181 + 0.00141 (- V) e^ [(0.0251) (T + 460) - 20.43] = 5.22 E-04 lb/ton
$EF_{Org\ PM}$ = 0.00141 (-V) e^ [(0.0251) (T + 460) - 20.43] = 3.41 E-04
EF_{TOC} = 0.0172 (- V) e^ [(0.0251) (T + 460) - 20.43] = 4.16 E-03
EF_{CO} = 0.00558 (-V) e^ [(0.0251)(T + 460) - 20.43] = 1.35 E-03

[b] (600,000 ton/yr) x (5.22 E-04 lb/ton) x (ton/2,000 lb) = 0.16 TPY

Table 11 - Loadout (HAPs Speciation - Organic Particulate Based Compounds)

HAP	[a]Speciation, %	[b]Emission Factor, lb/ton	Annual Emissions, TPY
PAH HAPs			
Acenaphthene	0.26	[c]8.87 E-07	[d]2.66 E-04
Acenaphthylene	0.028	9.55 E-08	2.87 E-05
Anthracene	0.070	2.39 E-07	7.17 E-05
Benzo(a)anthracene	0.019	6.48 E-08	1.94 E-05
Benzo(b)fluoranthene	0.0076	2.59 E-08	7.77 E-06
Benzo(k)fluoranthene	0.0022	7.50 E-09	2.25 E-06
Benzo(g,h,i)perylene	0.0019	6.48 E-09	1.94 E-06
Benzo(a)pyrene	0.0023	7.84 E-09	2.35 E-06
Benzo(e)pyrene	0.0078	2.66 E-08	7.98 E-06
Chrysene	0.103	3.51 E-07	1.05 E-04
Dibenz(a,h)anthracene	0.00037	1.26 E-09	3.78 E-07
Fluoranthene	0.050	1.71 E-07	5.13 E-05
Fluorene	0.77	2.63 E-06	7.89 E-04
Indeno(1,2,3-cd)pyrene	0.00047	1.60 E-09	4.80 E-07
2-Methylnaphthalene	2.38	8.12 E-06	2.44 E-03
Naphthalene	1.25	4.26 E-06	1.28 E-03
Perylene	0.022	7.50 E-08	2.25 E-05
Phenanthrene	0.81	2.76 E-06	8.28 E-04
Pyrene	0.15	5.12 E-07	1.54 E-04
Total PAH HAPs	5.93	2.02 E-05	6.06 E-03
Other Semi-Volatile HAPs			
Phenol	1.18	4.02 E-06	1.21 E-03

[a] AP-42, Table 11.1-15 (3/04)

[b] Determined by multiplying the speciation percent by the organic PM in Table 10 - Load Out

[c] (2.6 E-03) x (3.41 E-04) = 8.87 E-07

[d] (600,000 ton/yr) x (8.87 E-07 lb/ton) x (ton/2000 lb) = 2.66 E-04

Table 12 - Loadout (HAPs Speciation - Organic Volatile Based Compounds)

HAP	[a]Speciation, %	[b]Emission Factor, lb/ton	Annual Emissions, TPY
Benzene	0.052	[c]2.16 E-06	[d]6.48 E-04
Bromomethane	0.0096	3.99 E-07	1.20 E-04
2-Butanone	0.049	2.04 E-06	6.12 E-04
Carbon Disulfide	0.013	5.41 E-07	1.62 E-04
Chloroethane	0.00021	8.74 E-09	2.62 E-06
Chloromethane	0.015	6.24 E-07	1.87 E-04
Cumene	0.11	4.58 E-06	1.37 E-03
Ethylbenzene	0.28	1.16 E-05	3.48 E-03
Formaldehyde	0.088	3.66 E-06	1.10 E-03
n-Hexane	0.15	6.24 E-06	1.87 E-03
Iso-octane	0.0018	7.49 E-08	2.25 E-05
Methylene Chloride	0.0	0.0	0.0
MTBE	0.0	0.0	0.0
Styrene	0.0073	3.04 E-07	9.12 E-05
Tetrachloroethene	0.0077	3.20 E-07	9.60 E-05
Toluene	0.21	8.74 E-06	2.62 E-03
1,1,1-Trichloroethane	0.0	0.0	0.0
Trichloroethene	0.0	0.0	0.0
Trichlorofluoromethane	0.0013	5.41 E-08	1.62 E-05
m-/p-Xylene	0.41	1.71 E-05	5.13 E-03
o-Xylene	0.08	3.33 E-06	9.99 E-04
Total VOC HAPs	1.5	6.24 E-05	1.87 E-02

[a] AP-42, Table 11.1-16 (3/04)

[b] Determined by multiplying the speciation percent by the TOC in Table 10 - Load Out

[c] (5.2 E-04) x (4.16 E-03) = 2.16 E-06

[d] (600,000 ton/hr) x (2.16 E-06 lb/ton) x (ton/2000 lb) = 6.48 E-04 TPY

Table 13 - Silo Filling

Pollutant	[a]Emission Factor, lb/ton	Annual Emissions, TPY
Total PM	5.86 E-04	[b]0.18
Organic PM (HAPs)	2.54 E-04	0.08
TOC	1.22 E-02	3.66
CO	1.18 E-03	0.35

[a] AP-42, Table 11.1-14 (3/04)

V = - 0.5, T = 325° F default values per footnote a

EF_{PM} = 0.000332 + 0.00105 (- V) e^ [(0.0251) (T + 460) - 20.43] = 5.86 E-04 lb/ton

$EF_{Org\ PM}$ = 0.00105 (-V) e^ [(0.0251) (T + 460) - 20.43] = 2.54 E-04

EF_{TOC} = 0.0504 (-V) e^ [(0.0251) (T + 460) - 20.43] = 1.22 E-02
EF_{CO} = 0.00488 (-V) e^ [(0.0251) (T + 460) - 20.43] = 1.18 E-03

[b] (600,000 ton/yr) x (5.86 E-04 lb/ton) x (ton/2,000 lb) = 0.18 TPY

Table 14 - Silo Filling (HAPs Speciation - Organic Particulate Based Compounds)

HAP	[a]Speciation, %	[b]Emission Factor, lb/ton	Annual Emissions, TPY
PAH HAPs			
Acenaphthene	0.47	[c]1.19 E-06	[d]3.57 E-04
Acenaphthylene	0.014	3.56 E-08	1.07 E-05
Anthracene	0.13	3.30 E-07	9.90 E-05
Benzo(a)anthracene	0.056	1.42 E-07	4.26 E-05
Benzo(b)fluoranthene	ND	----	----
Benzo(k)fluoranthene	ND	----	----
Benzo(g,h,i)perylene	ND	----	----
Benzo(a)pyrene	ND	----	----
Benzo(e)pyrene	0.0095	2.41 E-08	7.23 E-06
Chrysene	0.21	5.33 E-07	1.60 E-04
Dibenz(a,h)anthracene	ND	----	----
Fluoranthene	0.15	3.81 E-07	1.14 E-04
Fluorene	1.01	2.57 E-06	7.71 E-04
Indeno(1,2,3-cd)pyrene	ND	----	----
2-Methylnaphthalene	5.27	1.34 E-05	4.02 E-03
Naphthalene	1.82	4.62 E-06	1.39 E-03
Perylene	0.030	7.62 E-08	2.29 E-05
Phenanthrene	1.80	4.57 E-06	1.37 E-03
Pyrene	0.44	1.12 E-06	3.36 E-04
Total PAH HAPs	11.40	2.90 E-05	8.70 E-03
Other Semi-Volatile HAPs			
Phenol	ND	----	----

[a] AP-42, Table 11.1-15 (3/04)

[b] Determined by multiplying the speciation percent by the organic PM in Table 13

[c] (4.7 E-03) x (2.54 E-04) = 1.19 E-06

[d] (600,000 ton/hr) x (1.19 E-06 lb/ton) x (ton/2000 lb) = 3.57 E-04

Table 15 - Silo Filling (HAPs Speciation - Organic Volatile Based Compounds)

HAP	[a]Speciation, %	[b]Emission Factor, lb/ton	Annual Emission, TPY
Benzene	0.032	[c]3.90 E-06	[d]1.17 E-03
Bromomethane	0.0049	5.98 E-07	1.79 E-04
2-Butanone	0.039	4.76 E-06	1.43 E-03
Carbon Disulfide	0.016	1.95 E-06	5.85 E-04
Chloroethane	0.004	4.88 E-07	1.46 E-04
Chloromethane	0.023	2.81 E-06	8.43 E-04
Cumene	non-detect	0.0	0.0
Ethylbenzene	0.038	4.64 E-06	1.39 E-03
Formaldehyde	0.69	8.42 E-05	2.53 E-02
n-Hexane	0.10	1.22 E-05	3.66 E-03
Iso-octane	0.00031	3.78 E-08	1.13 E-05
Methylene Chloride	0.00027	3.29 E-08	9.87 E-06
MTBE	ND	0.0	0.0
Styrene	0.0054	6.59 E-07	1.98 E-04
Tetrachloroethene	ND	0.0	0.0
Toluene	0.062	7.56 E-06	2.27 E-03
1,1,1-Trichloroethane	ND	0.0	0.0
Trichloroethene	ND	0.0	0.0
Trichlorofluoromethane	ND	0.0	0.0
m-/p-Xylene	0.2	2.44 E-05	7.32 E-03
o-Xylene	0.057	6.95 E-06	2.09 E-03
Total VOC HAPs	1.3	1.59 E-04	4.77 E-02

[a] AP-42, Table 11.1-16 (3/04)

[b] Determined by multiplying the speciation percent by the TOC in Table 13

[c] (3.2 E-04) x (1.22 E-02) = 3.90 E-06

[d] (600,000 ton/hr) x (3.90 E-06 lb/ton) x (ton/2,000 lb) = 1.17 E-03 TPY

Table 16 - [a]Facility Emissions Summary (Criteria)

Pollutant	Drum Mix	Diesel Engine	Hot Oil Heater	Load-out	Silo Filling	Aggregate Handling	Storage Piles	Unpaved Roads	Total
CO	39.00	2.06	0.35	0.41	0.35	--	--	--	42.17
NO_x	16.50	21.27	1.39	--	--	--	--	--	39.16
SO_2	3.30	0.50	4.94	--	--	--	--	--	8.74
TSP	9.90	0.29	0.14	0.16	0.18	6.06	1.00	11.80	29.53
PM_{10}	6.90	0.28	0.08	0.16	0.18	2.88	0.47	2.87	13.82
$PM_{2.5}$	0.87	0.26	0.06	--	--	--	0.15	0.44	1.78
VOC	9.60	0.72	0.04	1.25	3.66	--	--	--	15.27
Pb	4.50E-03	--	9.05E-05	--	--	--	--	--	4.59E-03

[a] Emissions in TPY

Table 17 - [a]Facility Emissions Summary (HAPs)

Drum Mix	Diesel Engine	Hot Oil Heater	Loadout	Silo Filling	Total
3.12 (non-PAH and PAH) 3.71 E-02 (Metal HAPs)	2.87 E-02	1.88 3.68 E-04 (Metal HAPs)	1.87 E-02 (VOC HAPs) 6.06 E-03 (PAH HAPs) 1.21 E-03 (Semi Volatile HAPs)	4.77 E-02 (VOC HAPs) 8.70 E-03 (PAH HAPs)	8.82

[a] Emissions in TPY

Air Quality Assessment:
Screen3 modeling was used to predict maximum concentrations in simple and complex (valley) terrain. Rural option and default met data were used in the modeling runs. Based on the GEP calculations for nearby buildings, the 120 ton bin was the applicable structure for downwash purposes. For simple terrain, receptors were placed starting at the fenceline, 91 meters being the closest point, and receptor spacing 100 meters apart. For complex terrain, receptors were placed starting at 500 meter distance from the source at starting elevation of 9 meters. Simple terrain runs provided the worst-case emission concentrations.

Conversion scaling factors to convert 1-hour concentration to 3-, 8-, 24-hour, and annual concentrations are 0.9, 0.7, 0.4 and 0.2.

Modeling results with comparison to SAAQS are shown in Table 21. Background concentrations were obtained from the Annual Summary Air Quality Data 2005. The results demonstrate compliance with SAAQS.

PROPOSED

Table 18 - Short-Term Emission Rates (g/s)

Unit	PM_{10}	CO	SO_2	NO_x
Diesel Engine	[a]0.0452	0.3313	0.0803	3.4132
Hot Oil Heater	[b]0.0022	0.0101	0.1428	0.0402
Drum Mix Baghouse	[c]1.16	6.55	0.55	2.77

[a] (0.09 g/hp-hr) x (1,807 hp) x (1 hr/3,600 sec) = 0.0452 g/s

[b] (15.97 gal/hr) x (1.08 lb/10^3 gal) x (hr/3,600 s) x (g/2.205 E-03 lb) = 0.0022 g/s

[c] (0.23 lb/ton) x (400 ton/hr) x (hr/3,600 s) x (g/2.2.5 E-03 lb) = 1.16 g/s

Table 19 - Long-Term Emission Rates (g/s)

Unit	PM_{10}	SO_2	NO_x
Diesel Engine	[a]0.0081	0.0144	0.6117
Hot Oil Heater	Same As Short-Term Emission Rates		
Drum Mix Baghouse	[b]0.1985	0.0949	0.4746

[a] (1,807 bhp) x (0.09 g/hp-hr) x (1,570 hr/yr) x (yr/8,760 hr) x (1 hr/3,600 sec) = 0.0081 g/s

[b] (600,000 ton/hr) x (0.023 lb/ton ton) x (yr/8,760 hr) x (hr/3,600 s) x (g/2.205 E-03 lb) = 0.1985 g/s

Table 20 - Stack Parameters

Unit	stack height (m)	stack dia. (m)	stack velocity (m/s)	stack temp. (K)
Diesel Engine	6.75	0.36	19.22	699
Hot Oil Heater	10	0.3048	4.8763	624.7
Drum Mix Baghouse	10.6	1.76	42.47 m^3/s	389

Table 21 - Modeling Results

Pollutant	Averaging Period	Concentration (ug/m^3)	[a]Background (ug/m^3)	Total (ug/m^3)	SAAQS (ug/m^3)	Percent of SAAQS (%)
SO_2	3-hr	413.74	427	840.74	1,300	65
	24-hr	183.88	107	290.88	365	80
	Annual	61.47	8	69.47	80	87
NO_2	Annual	[b]45.98	9	54.98	70	79
PM_{10}	24-hr	117.84	29	146.84	150	98
	Annual	10.84	15	25.84	50	52
CO	1-hr	1,719.76	3762	5,481.76	10,000	55
	8-hr	1,203.83	2323	3,526.83	5,000	71

[a] 2004 Annual Summary Hawaii Air Quality Data: Kapolei monitoring station for NO_2
Honolulu monitoring station for PM_{10} Annual
Hilo monitoring station for PM_{10} 24-hr, SO_2 3-hr and 24-hr
Kona monitoring station for SO_2 Annual
University for CO

[b] Ozone Limiting Method. Background ozone value, 34 ug/m^3 , taken from 2004 Hawaii Air Quality Data

$NO_{2\,[max]} = 0.1\ NO_{x\,[max]} + (NO_2 / O_3)\ (O_3\ ambient)$

$= (0.1)(133.99) + (46/48)(34) = 45.98$

Significant Permit Conditions:

1. Special Condition Nos. C.1.a and b: Asphalt concrete production and fuel restriction limits for the asphalt concrete plant and diesel engine generator, respectively, were proposed to meet NO_2 annual SAAQS and be below the NO_x significant level .
2. Special Condition No. C.4: The particulate matter emission limit of 0.04 gr/dscf is required under NSPS Subpart I.

Other Issues/Conditions:

1. Alternate operating scenario for a temporary replacement diesel engine was not included in the permit application. Per meeting with David Collentine on January 25, 2006, he requested the use of alternate operating scenario. E-mail 01/24/06 references another generator of the same if the permitted diesel engine is replaced with a temporary one.
2. S-1 application indicated HCS-100 hot oil heater (8.9 gal/hr). Applicant re-submitted specs for HC-200 (15.9 gal/hr). Emission calculations and rates were used for the HC-200.
3. Called manufacturer of the baghouse on 6/15/06 to determine nominal pressure drop range across the filter bags. The pressure can vary depending on the type of fabric used for the filter bags and the rate of asphalt production. Operating range is from 5 to 6 inches of water.

Conclusion and Recommendation:

Applicant has demonstrated compliance with SAAQS. Measures will be taken to control fugitive dust from work area and storage piles with the use of a water truck. Conditions are stipulated in the permit to meet applicable state (Hawaii Administrative Rules) and federal regulations (NSPS, etc.). As such, issuance of the initial covered source permit is recommended following 30-day public comment and 45-day EPA review periods.

Reviewer: Carl Ibaan
Date: June 16, 2006