PROPOSED

PERMIT APPLICATION REVIEW
COVERED SOURCE PERMIT (CSP) NO. 0522-01-C
Covered Source Permit Application Renewal No. 0522-05

Applicant: Grace Pacific Corporation

Facility: 300 TPH Hot Mix Asphalt Drum Plant

SIC Code: 2951 (asphalt paving mixtures and blocks)

Location: Kapaa Quarry, Kailua, Oahu

UTM Coordinates: 626,200 Meters East and 2,366,050 Meters North, NAD-83

Responsible Official: Mr. Christopher Steele
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1. Background

1.1 Grace Pacific Corporation has submitted a covered source permit renewal application for an existing 300 ton per hour (TPH) hot mix asphalt (HMA) plant. Electricity for the facility is supplied by the local utility grid. Existing permit conditions limit hot mix asphalt production to 1,200,000 tons per year (TPH) and plant operation to 18 hours per day. Fuel oil No. 2 with maximum 0.5% by weight sulfur content or alternate fuels will be used at the existing plant. Alternate fuels include biodiesel, Ecodiesel supplied by Unitek Solvent Services, Inc., grease trap oil/cooking oil, and aviation fuel. The drum mixer dryer is equipped with a baghouse to control particulate emissions. A blue smoke collection system is also used to control particulate emissions from filing silos and loading trucks with hot mix asphalt.

1.2 Based on information from permit application review No. 0395-03 for Unitek Solvent Services, Inc., the specifications for the fuel oil supplied by Unitek Solvent Services, Inc. fall between those for diesel No. 2 and diesel No. 4. Therefore, the diesel oil product should have emissions similar to diesel fuel No. 2, but lower than waste oil.

1.3 Emissions from firing boidiesel and grease trap oil/cooking oil were considered to be similar to emissions for burning fuel oil No. 2. Grease trap oil, however is not processed like biodiesel. Biodiesel is produced by reacting feedstock, such as vegetable oil, with alcohol (e.g., methanol) and catalyst (e.g., sodium methylate) to produce biodiesel and glycerin (glycerol). Emission factors for firing fuel oil No. 2 were used to predict emissions for burning grease trap oil and biodiesel, except that NO_X emissions were increased by 13%. The 13% increase in NO_X emissions is based on information from Figure ES-A of EPA's report, "A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions" (EPA420-P-02-001), dated October 2002.

1.4 Emissions for firing equipment on aviation fuel were assumed to be representative of those determined with emission factors for burning fuel oil No. 2.

1.5 Equipment for the facility is listed as follows:

Equipment	Manufacturer	Model No.	Serial No.	Maximum Capacity
double barrel drum mixer	ASTEC	RDB-8438	02-092-2204	300 TPH
drum mixer burner	ASTEC	WJ-75UO/G1	02-092-2206	75 MMBtu/hr
baghouse with cyclone	ASTEC	SBH-59: BP	94-109-217	51,110 CFM
fiberbed mist collector	ASTEC	BSC-16-FBF	06-042	12,000 CFM
cold feed system	ASTEC	----------	----------	5-bin storage
scalping screen for cold feed system	ASTEC	----------	----------	----------
RAP feed system	ASTEC	----------	----------	----------
scalping screen for RAP feed system	ASTEC	----------	----------	----------
HMA storage system	ASTEC	----------	----------	(two 150 ton silos and 300 TPH bucket elevator)

1.7 Pictures from a May 8, 2008 site visit of the facility are shown in Enclosure (1).

2. Applicable Requirements

2.1 Hawaii Administrative Rules (HAR), Title 11
Chapter 59, Ambient Air Quality Standards
Chapter 60.1, 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 dust
11-60.1-38 Sulfur Oxides from Fuel Combustion
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 - Standards of Performance for Stationary Sources
11-60.1-161 New Source Performance Standards
Subchapter 10 - Field Citations

2.2 40 CFR, Part 60, New Source Performance Standards (NSPS), Subpart I, Standards of Performance for Hot Mix Asphalt Facilities is applicable to the new 300 TPH hot mix asphalt facility because the plant is being constructed after June 11, 1973

2.3 A synthetic minor source is a facility that is potentially major (as defined in HAR §11-60.1-1) but is made non-major through federally enforceable permit conditions. This facility is a synthetic minor source for CO and NOx based on potential emissions that exceed the major source threshold when the facility is operated at its maximum capacity continuously for 8,760 hr/yr. See Paragraph 6.9.

2.4 Prevention of Significant Deterioration (PSD) review does not apply because the facility is not considered a major stationary source as defined in 40 CFR 52.21 and HAR Title 11, Chapter 60.1, Subchapter 7.

2.5 The facility is not a major source for hazardous air pollutants (HAPs) and is not subject to National Emissions Standards for Hazardous Air Pollutants (NESHAPS) or Maximum Achievable Control Technology (MACT) requirements under 40 CFR, Parts 61 and 63. Facility-wide HAP emissions are less than 10 TPY single HAP and 25 TPY combined HAP.

2.6 Annual emissions reporting will be required because this facility is a covered source.

2.7 The consolidate emissions reporting rule (CERR) is not applicable because emissions from the facility do not exceed reporting levels pursuant to 40 CFR 51, Subpart A (see table below).

CERR APPLICABILITY			
Pollutant	Facility Emissions	CERR Triggering Levels (TPY)	
		1 year cycle (type A sources)	3 year cycle (type B sources)
PM_{10}	26.4	≥ 250	≥ 100
SO_2	47.4	≥ 2,500	≥ 100
NO_X	37.3	≥ 2,500	≥ 100
VOC	29.0	≥ 250	≥ 100
CO	79.5	≥ 2,500	≥ 1,000

2.9 A best available control technology (BACT) analysis is not required because there are no modifications proposed for the facility for the permit renewal.

2.10 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 pre-control emissions that are greater than the major source level; and (5) not otherwise be exempt from CAM. Although a baghouse will be used to comply with federal particulate emission limit for the drum mixer dryer, CAM is not applicable because operational limits will be imposed to restrict this facility from exceeding the major source thresholds.

3. Insignificant Activities

3.1 The applicant indicated that the 725 kW diesel engine generator will be used during power outages to keep the plant running to clean out hot mix asphalt to prevent equipment from being clogged. The diesel engine generator is an insignificant activity in accordance with HAR §11-60.1-82 (f)(5).

3.2 The following storage tanks are insignificant activities pursuant to HAR §11-60.1-82(f)(1).

1) 10,000 gallon diesel fuel tank;
2) 6,000 gallon diesel fuel tank;
3) Two (2) 30,000 gallon asphalt cement tank;
4) 31,040 gallon asphalt cement tank; and
5) 25,000 gallon working asphalt cement tank.

4. Alternative Operating Scenarios

4.1 There were no alternate operating scenarios proposed by the applicant.

5. Air Pollution Controls

5.1 The drum mixer dryer will be equipped with a 51,110 cubic feet per minute pulse jet baghouse for particulate control. The baghouse also removes steam and combustion products from the drum mixer dryer. Dust from the drum mixer dryer will enter a primary cyclone inertial separator where most of the larger particulates will be collected. Dust not collected by the separator will be returned to the process. Larger particles are removed to protect the bags from abrasion. The finer dust is collected by the fabric bags inside the baghouse. The bags are pulsed (cleaned) on line at a frequency that keeps the baghouse pressure differential within the specified range. The fine dust collected in the baghouse hopper can be returned to the process or discarded as waste depending on the mix design.

5.2 A fiberbed mist collector is used to control organic and inorganic particulate from silo filling and truck load out of hot mix asphalt. It was assumed that the unit has a 95% particulate control efficiency, however, manufacturer's literature indicates that particulate control efficiency for the unit is approaches 100% for particulate ≥ 3 um and is as high a 99.5% for particulate < 3 um. As indicated in manufacture's literature, the fiberbed mist collector controls blue smoke which is the leading cause of odor complaints at asphalt facilities. Pursuant to permit application review 0522-03, the fiberbed mist collector consists of three sections that include knock-out, prefilter, and coalescing candle filter sections described as follows;

a. Inside the knock-out section, gases from hot asphalt mix truck loading and silo filling operations are routed through exhaust ducts to a collector inlet chamber that is maintained below 120 ^{O}F by use of a 40 hp fan (12,00 CFM capacity) that cools the exhaust gas. Cooling the exhaust allows pollutants to condense out of the exhaust stream, collect at the bottom of the unit, and discharge through an outlet pipe.

b. From the knock-out section, the gas stream passes through the prefilter section that consists of a bed of six filters (2' x 2' x 1') that collects particulate.

c. After passing through the prefilter section, the gas stream moves underneath a vertical

baffle and enters the bottom end of the candle filters. Hydrocarbons are captured on the inside of the filters where particles coalesce into droplets. The droplets drain to the bottom of the section that collects the liquid waste. Collected waste is periodically pumped out for disposal.

5.3 A water truck will be used for fugitive dust control at the facility.

6. Project Emissions

6.1 Emissions of NO_X, CO, PM, PM_{10}, $PM_{2.5}$, and HAPs from the drum mixer dryer were based on data from AP-42, Section 11.1(3/04), Hot Mix Asphalt Plants. Emission factors for the firing of fuel oil No.2 and processes using a bagouse were applied to estimate emissions. A mass balance calculation was used to determine the amount of fuel bound sulfur for burning fuel oil No. 2 with 0.5% by weight maximum sulfur content. Sulfur dioxide emissions were determined based on information from AP-42, Section 11.1 (3/04), Table 11.1-17 (foot note c) indicating that fifty percent of the fuel bound sulfur, up to a maximum (as SO_2) of 0.1 lb/ton of product, is expected to be retained in the hot mix asphalt product with the remainder emitted as SO_2. A hot mix asphalt production limit of 289,080 tons per year was assumed for the emission estimates. It was assumed that the maximum capacity of the drum mixer dryer was 275 tons per hour. Emissions are shown in Enclosure (2) and summarized below.

DRUM MIXER DRYER				
Pollutant	Drum Mixer Rate		Burner Emissions (TPY)	
	300 TPH		300 TPH	
	lb/hr	g/s	1,200,000 tons/year	8,760 hours/year
SO_2	3.30	0.417	6.6	14.5
NO_X	18.65	2.354	37.3	81.7
CO	39.00	4.924	78	170.8
VOC	-------	--------	19.2	42.0
PM	-------	-------	19.8	43.4
PM_{10}	6.90	0.871	13.8	30.2
$PM_{2.5}$	-------	-------	1.7	3.8
HAPs	-------	-------	5.3	11.6

6.2 Emissions from silo filling were predicted using AP-42, Section 11.1(3/04), Hot Mix Asphalt Plants. A 1,200,000 ton per year hot mix asphalt production limit was used to determine emissions. Default values were used for the emission factor equations that included a hot mix asphalt temperature of 325 ^{O}F and an asphalt volatility factor of -0.5. Emissions are shown in Enclosure (3) and summarized in the table below.

SILO FILLING		
Pollutant	Emissions (TPY)	Total Plant Emissions (TPY)
	1,200,000 tons/yr	8,760 hr/yr
CO	0.7	1.6
PM	0.02	0.04
PM_{10}	0.02	0.04
$PM_{2.5}$	0.02	0.04
VOC	7.3	16.0
HAPS	0.112	0.246

6.3 Emissions from hot mix asphalt load-out were predicted using AP-42, Section 11.1(3/04), Hot Mix Asphalt Plants. A 1,200,000 TPY hot mix asphalt production limit was used to determine emissions. Default values were used for the emission factor equations that included a hot mix asphalt temperature of 325 ^{O}F and an asphalt volatility factor of -0.5. Emissions are shown in Enclosure (4) and summarized in the table below.

HOT MIX ASPHALT LOAD-OUT		
Pollutant	Emissions (TPY)	Total Plant Emissions (TPY)
	1,200,000 tons/yr	8,760 hr/yr
CO	0.8	1.8
PM	0.02	0.03
PM_{10}	0.02	0.03
$PM_{2.5}$	0.02	0.03
VOC	2.5	5.5
HAPS	0.052	0.104

6.4 Particulate emissions from stockpiles were predicted using emission factors from AP-42, Section 13.2.4 (11/06), Aggregate Handling and Storage Piles. A 70% control efficiency was assumed for use of water sprays. A 1,128,000 ton per year aggregate throughput (94% of asphalt production limit) was assumed for the emissions. Emission estimates are shown in Enclosure (5) and summarized below.

STOCKPILE		
Pollutant	Emissions (TPY)	Total Plant Emissions (TPY)
	1,128,000 tons/yr	8,760 hr/yr
PM	5.1	40.8
PM_{10}	2.4	19.3
$PM_{2.5}$	0.4	2.9

6.5 Particulate emissions from vehicle travel on unpaved roads were predicted using AP-42, Section 13.2.2 (11/06), Unpaved Roads. A 70% control efficiency was assumed for use of water spray. A 1,200,000 ton per year hot mix asphalt throughput was assumed for the emission estimates. A 1,128,000 ton per year aggregate throughput was assumed for emission estimates that is 94% of the hot mix asphalt production. The s (silt content of road) parameter of 3.9% was based on information from AP-42, Section 13.2.2 – Unpaved Roads Related Information www.epa.gov//ttn/chief/ap42/ch13/related/c13s02-2.html. Other assumptions are shown in for the emission estimates are shown in Enclose (6). Emissions are summarized in the table below.

VEHICLE TRAVEL ON UNPAVED ROADS		
Pollutant	Emissions (TPY)	Total Plant Emissions (TPY)
	1,200,000 tons/yr HMA 1,128,000 tons/yr Aggregate	8,760 hr/yr
PM	21.2	46.5
PM_{10}	5.2	11.4
$PM_{2.5}$	0.5	1.1

6.6 Particulate emissions from aggregate handling were predicted using AP-42, Section 11.19.2 (8/04), Crushed Stone Processing and Pulverized Mineral Processing. A 70%

control efficiency was assumed for use of water sprays. A 1,128,000 ton per year aggregate throughput was assumed for the emission estimates based on information from other Grace Pacific Asphalt plants that 94% of the hot mix asphalt is comprised of aggregate. Emissions are shown in Enclosure (7) and summarized below.

AGGREGATE HANDLING		
Pollutant	Emissions (TPY)	Total Plant Emissions (TPY)
	1,128,000 tons/yr	8,760 hr/yr
PM	14.3	33.4
PM_{10}	5.0	10.0
$PM_{2.5}$	2.1	4.9

6.7 Total facility emissions are shown in the table below.

TOTAL FACILITY EMISSIONS								
Pollutant	Potential Emissions (TPY)							
	Drum Mixer Dryer	Silo Filling	Truck Load Out	Stockpiles	Vehicle Travel on Unpaved Roads	Aggregate Handling	Entire Facility	
							Permit Limits	No Limits
SO_2	47.4	--------	--------	--------	--------	--------	47.4	103.8
NO_X	37.3	--------	--------	--------	--------	--------	37.3	81.7
CO	78.0	0.7	0.8	--------	--------	--------	79.5	174.2
VOC	19.2	7.3	2.5	--------	--------	--------	29.0	63.5
PM	19.8	0.02	0.02	5.1	21.2	14.3	60.4	164.2
PM_{10}	13.8	0.02	0.02	2.4	5.2	5.0	26.4	71.0
$PM_{2.5}$	1.7	0.02	0.02	0.4	0.5	2.1	4.7	12.8
HAPs	5.3	0.112	0.052	--------	--------	--------	5.5	12.0

7. Air Quality Assessment

7.1 An ambient air quality impact analysis is not required for the hot mix asphalt plant because there are no changes proposed for the permit renewal.

8. Significant Permit Conditions

8.1 The total hot mix asphalt production for the 300 TPH hot mix asphalt plant shall not exceed 1,200,000 tons in any rolling twelve-month (12-month) period.

8.2 Operation of the 300 TPH hot mix asphalt plant shall not exceed 18 hours per day.

Reasons for 8.1 and 8.2: The 1,200,000 ton per year production limit was proposed by the applicant in the initial application. The limit was used for the air modeling assessment and prevents the facility from triggering major source thresholds. Emissions, based on the limits, are also below BACT thresholds.

8.3. Equipment for the facility shall be fired only on one or a combination of the following fuels with a maximum sulfur content for each fuel not to exceed 0.5% by weight:

1) Fuel oil No. 2;

2) Biodiesel meeting American Society for Testing and Materials D6751;
3) Ecodiesel supplied by Unitek Services, Inc;
4) Aviation fuel (e.g., Jet A, Jet A-1, JP-4, JP-5, JP-8, etc.); and
5) Grease trap oil/cooking oil.

Reason for 8.3: These conditions were incorporated based on the types of fuels proposed by the applicant. It was assumed that the maximum fuel sulfur content for the drum mixer dryer was 0.5% for the initial air modeling assessment.

8.4 Incorporate NSPS, Subparts I requirements.

Reason for 8.4: Incorporate pursuant to Paragraph 2.2.

9. Conclusion and Recommendation

9.1 Emissions from the facility are limited. The maximum sulfur content for the fuels proposed for the new facility is 0.5% by weight. A baghouse will be operated for the new plant to control particulate emissions from the drum mixer dryer. The facility is equipped with a fiberbed mist collector to control particulate and VOCs from operations to load silos and trucks with hot mix asphalt. As indicated in manufacture's literature, the fiberbed mist collector controls blue smoke which is the leading cause of odor complaints at asphalt facilities. A water truck and water spray system will also be used to control fugitive dust. Recommend the issuance of the covered source permit to Grace Pacific Corporation subject to the incorporation of the significant permit conditions, 30-day public comment period, and 45-day review by EPA.

Mike Madsen 5-8-2008