**PROPOSED (11/09/04)**

**Significant Modification to a Covered Source**
**Permit Review Summary**

**Application File No.:** 0311-05

**Permit No.:** 0311-03-C

**Applicant:** Hawaiian Cement
Concrete and Aggregate Division

**Facility Title:** Hawaiian Cement
Concrete and Aggregate Division
Halawa Aggregates Processing Facility
99-1100 Halawa Valley Street
Aiea, Hawaii 96701

UTM coordinates: 613,600 meters east
NAD 83 2,364,100 meters north

**Mailing Address:** Hawaiian Cement
Concrete and Aggregate Division
99-1300 Halawa Valley Street
Aiea, Hawaii 96701

**Responsible Official:** Mr. Carl L. Simons
President
Ph. (808) 532-3401

**Point of Contact:** Mr. Dane Wurlitzer
Environmental Manager
Ph. (808) 673-4226

**Application Date:** July 1, 2003

**Additional Information:** April 10, 2004

**Proposed Project:**

The Standard Industrial Classification (SIC) Code is 1429 under *Crushed and Broken Stone, Not Elsewhere Classified.*

Hawaiian Cement currently operates an aggregate mining, quarry and crushing facility located at 99-1100 Halawa Valley Street, Aiea, Hawaii. The quarry is located in a watershed area. Basalt rock from the quarry is loosened by drilling and blasting and is then excavated by front end loaders. The excavated material is loaded into quarry trucks or transported directly by the wheel loaders to the aggregate handling facilities.

Hawaiian Cement is proposing to upgrade its existing Halawa Aggregates and Processing Facility by the addition of the following equipment:

1. 545 kW (prime) diesel engine generator (Caterpillar 3412C) located near the quarry face,
2. 50 x 24 grizzly feeder (Kolberg-Pioneer KPI),
3. 653 tph portable jaw crusher (Kolberg-Pioneer 4450) located near the quarry face,
4. 8 x 24 screening tower (Deister XHM-3824),
5. 7 x 20 wash screen, horizontal (Deister TFM3P-3720),
6. 2,500 feet of conveyors to carry the primary crushed rock to the new screens from where it will be eventually conveyed to the existing wet and dry plants,
7. 625 tph roller cone crusher (JCI Kodiak 400),
8. 150 ton flyash silo with baghouse at concrete batch plant no. 1, and
9. 150 ton flyash silo and flyash weigh hopper with baghouse at concrete batch plant no. 3.

The following existing equipment will also be eliminated:

1. Wet mill plant's apron feed to gyratory crusher,
2. Wet mill plant's gyratory crusher (GO), and
3. Dry mill plant's crusher (CR1)

Proposed Upper Processing Area

The proposed new system will eliminate the need for 50 ton haul trucks moving rock from the mining site to the processing area. With the new system, a front-end loader will deposit rock from the quarry into the grizzly feeder which serves the 653 tph portable jaw crusher. The 545 kW diesel engine generator provides power to the crusher. The applicant is proposing a 6000 hr/yr limit on the 545 kW diesel engine generator. The primary crushed material will then be conveyed some 2500 feet to a 8 x 24 screening tower. The fines passing through that screen will be conveyed to a tripper feed conveyor which can create three stockpiles. Material from these stockpiles will be transferred via belt feeders and tunnel conveyors to the existing wash plant.

The larger material coming off the screening tower will be conveyed to a secondary surge pile. From this pile the material will go to an apron feeder and then a tunnel conveyor to the new horizontal 7 x 20 wash screen. Fines material passing this screen will go directly to the wet plant for further processing. The large material from the screen will pass to a bin and vibrating feeder and then to a 625 tph roller cone crusher. Material exiting the crusher will be conveyed to surge piles pending transfer to the dry plant for final processing.

Proposed New Flyash Silos

Concrete batch plant no. 1 will have an additional flyash silo added to its configuration. This silo will have its own baghouse for dust control and will also be connected to the existing flyash silo for transfer of material.

Concrete batch plant no. 3 will have a new flyash silo and flyash weigh hopper added to its configuration. Both devices will be controlled by a single baghouse unit.

An application fee for a significant modification to a covered source of $2,000.00 was submitted and processed.

**Equipment:**

1. 545 kW diesel engine generator - Caterpillar 3412C, S/N BPG00416,
2. 50 x 24 grizzly feeder - Kolberg-Pioneer KPI, S/N 40474,
3. 653 tph portable jaw crusher - Kolberg-Pioneer 4450, S/N 40474,
4. 8 x 24 screening tower - Deister XHM-3824, S/N 890182,
5. 7 x 20 wash screen, horizontal - Deister TFM3P-3720, S/N 980405,
6. 2500 overland conveyors,
7. 625 tph roller cone crusher - JCI Kodiak 400, S/N 40232,
8. 150 ton flyash silo with baghouse at concrete batch plant no. 1, and
9. 150 ton flyash silo and flyash weigh hopper with baghouse at concrete batch plant no. 3.

| Parameter | Caterpillar 3412C Diesel Engine Generator | Kolberg-Pioneer 4450 Jaw Crusher | JCI Kodiak 400 Roller Cone Crusher | Flyash Silo at Concrete Batch Plant No. 1 | Flyash Silo at Concrete Batch Plant No. 3 |
|---|---|---|---|---|---|
| Maximum Design Capacity | 545 ekW (prime) | 653 tph | 625 tph | 150 ton | 150 ton |
| Fuel Type | Diesel fuel no. 2 | n/a | n/a | n/a | n/a |
| Fuel Use | 41.5 gal/hr | n/a | n/a | n/a | n/a |
| Production Rates | 545 ekW | 500 tph | 505 tph | 50 tph | 50 tph |
| Raw Materials | Diesel fuel no. 2 | soil and rock | soil and rock | flyash | flyash |

**Air Pollution Controls:**

1. The diesel engine generator has the following air pollution controls:

   a. $SO_2$ control is achieved by the use of diesel fuel no. 2 with a sulfur content not exceeding 0.5% by weight.

   b. $NO_x$ control for the diesel engine generator is achieved by turbocharging and aftercooling as well as proper maintenance and operation of the diesel engine within its design specifications. This engine complies with EPA Tier 1 emission standards.

   c. CO and VOC control on the diesel engine generator is achieved by proper maintenance and operation of the equipment within design specifications to assure maximum oxidation of the hydrocarbon fuel to $CO_2$ and $H_2O$. The diesel engine generator complies with EPA Tier 1 emission standards.

d. PM control is achieved by use of low sulfur diesel fuel with an inherently low ash content and proper maintenance and operation of the fuel fired equipment within design specifications to assure complete combustion and conversion of carbon compounds to gaseous $CO_2$. The diesel engine generator complies with EPA Tier 1 emission standards.

2. Suppression of fugitive dust created during discharging, crushing, transferring of materials between conveyors, and screening of rock is accomplished by water sprays, baghouses, and enclosure of operations within structures. Fugitive dust emissions from the facility are controlled using the following measures:

   a. Water Sprays: Fugitive dust control for the proposed stone processing equipment will be accomplished by the application of water at critical locations and times to assure an adequate moisture content of the material being processed or conveyed. Water sprays are used to suppress particulate matter created at transfer points which are not enclosed, stockpiles and unpaved roads (water truck). An efficiency of 70 percent was assumed. Aggregate and sand that is damp from washing (wet screening operations) was assumed to have a 100 percent control efficiency.

   b. Baghouses: Baghouses are used to control particulate matter during the filling of the flyash silos. The estimated control efficiency used to calculate emissions from these filling operations was 99 percent. The proposed new flyash silos a the existing batch plants will be equipped with baghouse units which will ensure a high level of particulate matter control.

   c Enclosures: Equipment which is underground or completely enclosed was assumed to have a control efficiency of 100 percent. Partially enclosed or shrouded equipment was assumed to have a control efficiency of 70 percent.

**Applicable Requirements:**

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
  - 11-60.1-32 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, Non-Covered Sources & 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
- Subchapter 10 Field Citations

Federal Requirements

40 CFR Part 60 - Standards of Performance for New Stationary Sources (NSPS)
Subpart A - General Provisions
Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants (applicable to the wet mill plant, quarry plant's 653 tph portable jaw crusher, 625 tph roller cone crusher, 8 x 24 screening tower, 7 x 20 wash screen, and 2500 ft of conveyors)

**Non-applicable Requirements:**

Hawaii Administrative Rules (HAR)

Chapter 11-60.1 Air Pollution Control
Subchapter 7 Prevention of Significant Deterioration
Subchapter 9 Hazardous Air Pollutant Sources

Federal Requirements
40 CFR Part 52.21 - Prevention of Significant Deterioration of Air Quality
40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants (NESHAPS)
40 CFR Part 63 - National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technologies (MACT) Standards)

**Best Available Control Technology (BACT):**

A Best Available Control Technology (BACT) analysis is required for new covered sources or significant modifications to covered sources that have the potential to cause a net increase in air pollutant emissions above significant levels as defined in HAR 11-60.1-1. The applicant is proposing to add a diesel engine generator, crushers, screens, conveyors, and flyash silos to the existing facility. In order to assess if the proposed changes require a BACT analysis, the potential air emissions were compared to the previous past two year actual emissions (2002-2003). The results show that the net increase in emissions are significant for PM/$PM_{10}$. The main source of PM/$PM_{10}$ emissions are from the crushing operations which is controlled by wet suppression. Wet suppression can be considered to be BACT for suppressing fugitive dust.

| Pollutant | Potential Emissions (tpy) | 2002-2003 Average Actual Emissions (tpy) | Net Change in Emissions (tpy) | Significant Level (tpy) |
|---|---|---|---|---|
| $NO_x$ | 36.03 | 0 | 36.03 | 40 |
| CO | 16.11 | 0 | 16.11 | 100 |
| $SO_2$ | 8.80 | 0 | 8.80 | 40 |
| PM | 59.30 | 13.6 | 45.70 | 25 |
| $PM_{10}$ | 27.29 | 6.39 | 20.90 | 15 |
| VOC | 0.68 | 0 | 0.68 | 40 |

**Prevention of Significant Deterioration (PSD):**

This source is not a major stationary source nor are there modifications proposed that by itself constitute a major stationary source that is subject to PSD review. Therefore, PSD is not applicable.

**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 B point sources (as defined in 40 CFR Part 51, Subpart A), that emit at the CER triggering levels as shown in the table below.

| Pollutant | Type B CER Triggering Levels [1] (tpy) | Pollutant | In-house Total Facility Triggering Levels [2] (tpy) | Total Facility Emissions [3] (tpy) |
|---|---|---|---|---|
| $NO_x$ | ≥100 | $NO_x$ | ≥25 | 36.03 |
| $SO_2$ | ≥100 | $SO_2$ | ≥25 | 8.80 |
| CO | ≥1000 | CO | ≥250 | 16.11 |
| $PM_{10}$ | ≥100 | $PM/PM_{10}$ | ≥25/25 | 148.2/64.0 [4] |
| VOC | ≥100 | VOC | ≥25 | 0.68 |
| Pb | ≥ 5 | Pb | ≥5 | 0 |
| | | HAPS | ≥5 | 3.70 E-03 |

[1] Based on actual emissions
[2] Based on potential emissions
[3] Total facility emissions are based on renewal application no. 0311-04 and significant modification application no. 0311-05
[4] Total $PM/PM_{10}$ facility emissions are based on renewal application no. 0311-04 (PM = 88.9 tpy, $PM_{10}$ = 36.7 tpy) and significant modification application no. 0311-05 (PM = 59.30 tpy, $PM_{10}$ = 27.29 tpy)

This facility does not emit at the CER triggering levels. Therefore, CER requirements are not applicable.

Although CER for the facility is not triggered, the Clean Air Branch requests annual emissions reporting from those facilities that have facility-wide emissions of a single air pollutant exceeding in-house triggering levels. Annual emissions from these facilities are used within the Department and are not inputted into the AIRS database. Since the total emissions of $NO_x$ and $PM/PM_{10}$ within the facility is greater than 25 tons per year, annual emissions reporting for the facility will be required for in-house recordkeeping purposes.

**Compliance Data System (CDS):**

Compliance Data System (CDS) is an inventory system used to track covered sources subject to annual inspections. This source is subject to CDS because it is a covered source (subject to NSPS).

**Compliance Assurance Monitoring (CAM):**

40 CFR Part 64

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. In order for a source to be subject to CAM, each source must:

- Be located at a major source per Title V of the Clean Air Act Amendments of 1990;
- Be subject to federally enforceable applicable requirements;
- Have pre-control device potential emissions that exceed applicable major source thresholds;
- Be fitted with an "active" air pollution control device; and
- Not be subject to certain regulations that specifically exempt it from CAM.

Emission units are any part or activity of a stationary source that emits or has the potential to emit any air pollutant.

In the summary for Application File No. 0311-03, it was incorrectly stated that "CAM is not currently applicable to this facility, but CAM is applicable at the first permit renewal." For clarification, CAM is not applicable to this facility because, per EPA, watersprays used at the transfer points are not to be considered as active air pollution control devices, since they are passive air pollution control devices. Also, the silos with baghouses do not have emission limits.

**Synthetic Minor Source:**

Not applicable, this facility is a major source (>100 tpy) of PM with the addition of emissions from this modification to the existing facility. PM emissions are estimated to be the following resulting from the modification.

| PM Emissions Renewal Application No. 0311-04 | PM Emissions Significant Modification Application No. 0311-05 | Total PM Emissions |
|---|---|---|
| 88.9 | 59.3 | 148.2 |

**Insignificant Activities:**

No insignificant activities are proposed.

**Alternate Operating Scenarios:**

No alternate operating scenarios are proposed.

## Project Emissions:

**Emissions - 545 kW Diesel Engine Generator**

| Pollutant | Emission Factor (lb/MMBtu) | Emission Rate (lb/hr) | Potential Emissions [3] (tpy) | Controlled Emissions [4] (tpy) |
|---|---|---|---|---|
| $NO_x$ | | 12.01 [2] | 52.60 | 36.03 |
| $SO_2$ | 0.505 [1,5] | 2.93 [6] | 12.83 | 8.80 |
| CO | | 5.37 [2] | 23.52 | 16.11 |
| $PM/PM_{10}$ | | 0.68/0.68 [2] | 2.98/2.98 | 2.04/2.04 |
| VOC | | 0.22 [2] | 0.96 | 0.68 |
| Benzene | 7.76 E-04 [1] | 4.51 E-03 [6] | 1.98 E-02 | 1.35 E-02 |
| Toluene | 2.81 E-04 [1] | 1.63 E-03 [6] | 7.14 E-03 | 4.90 E-03 |
| Xylenes | 1.93 E-04 [1] | 1.12 E-03 [6] | 4.91 E-03 | 3.36 E-03 |
| Formaldehyde | 7.89 E-05 [1] | 4.58 E-04 [6] | 2.01 E-03 | 1.38 E-03 |
| Acetaldehyde | 2.52 E-05 [1] | 1.46 E-04 [6] | 6.39 E-04 | 4.39 E-04 |
| Acrolein | 7.88 E-06 [1] | 4.58 E-05 [6] | 2.01 E-04 | 1.37 E-04 |
| Total PAH | 2.12 E-04 [1] | 1.23 E-03 [6] | 5.39 E-03 | 3.70 E-03 |

[1] Based on AP-42, 10/96, Tables 3.4-1, 3.4-3 and 3.4-4

[2] Based on manufacturer's data

[3] Based on 8760 hrs/yr

[4] Based on a proposed limit of 6000 hrs/yr

[5] Based on an emission factor of 1.01S, S=0.5

[6] Based on 140,000 Btu/gal and 41.5 gal/hr feed rate, lb/hr = lb/MMBtu x 140,000 Btu/gal x 41.5 gal/hr x 1 MMBtu/ 1 E06 Btu

## Fugitive Emissions - Quarry Plant [1]

| Fugitive Emission Point | Source | Controlled PM Emissions (tpy) | Uncontrolled PM Emissions (tpy) | Controlled $PM_{10}$ Emissions (tpy) | Uncontrolled $PM_{10}$ Emissions (tpy) |
|---|---|---|---|---|---|
| F1 | Truck Unload to Grizzly Feeder | 0.01 [2,7] | 0.03 [2] | 0 [2,7] | 0.01 [2] |
| F2 | Grizzly to Primary Jaw Crusher | 0.82 [2,7] | 2.73 [2] | 0.30 [2,7] | 1.00 [2] |
| F3 | Primary Jaw Crusher | 0.19 [2,7] | 0.64 [2] | 0.66 [2,7] | 2.18 [2] |
| F4 | Primary Jaw Crusher to Under Conveyor | 0.82 [2,7] | 2.73 [2] | 0.30 [2,7] | 1.00 [2] |
| F5 | Under Conveyor to Conveyor | 0.82 [2,7] | 2.73 [2] | 0.30 [2,7] | 1.00 [2] |
| F6 | Conveyor to Conveyor | 0.82 [2,7] | 2.73 [2] | 0.30 [2,7] | 1.00 [2] |
| F7 | Conveyor to Conveyor | 0.82 [2,7] | 2.73 [2] | 0.30 [2,7] | 1.00 [2] |
| F8 | Conveyor to Conveyor | 0.82 [2,7] | 2.73 [2] | 0.30 [2,7] | 1.00 [2] |
| F9 | Conveyor to Feed Conveyor | 0.82 [2,7] | 2.73 [2] | 0.30 [2,7] | 1.00 [2] |
| F10 | Feed Conveyor to Deister Screen Tower | 0.82 [2,7] | 2.73 [2] | 0.30 [2,7] | 1.00 [2] |
| F11 | Deister Screen Tower | 6.83 [2,7] | 22.75 [2] | 2.38 [2,7] | 7.92 [2] |
| F12 | Deister Screen Tower to Under Conveyor | 0.20 [4,7] | 0.68 [4] | 0.08 [4,7] | 0.25 [4] |
| F13 | Under Conveyor to Tripper Feed Conveyor | 0.20 [4,7] | 0.68 [4] | 0.08 [4,7] | 0.25 [4] |
| F14 | Tripper Feed Conveyor to Stockpiles (for Wet Plant) | 0.20 [4,7] | 0.68 [4] | 0.08 [4,7] | 0.25 [4] |
| F15 | Deister Screen Tower to Conveyor | 0.61 [3,7] | 2.05 [3] | 0.23 [3,7] | 0.75 [3] |
| F16 | Conveyor to Conveyor | 0.61 [3,7] | 2.05 [3] | 0.23 [3,7] | 0.75 [3] |
| F17 | Conveyor to Surge Feed Conveyor | 0.61 [3,7] | 2.05 [3] | 0.23 [3,7] | 0.75 [3] |
| F18 | Surge Feed Conveyor to Surge Pile | 0.61 [3,7] | 2.05 [3] | 0.23 [3,7] | 0.75 [3] |
| F19 | Surge Pile to Apron Feeder | 0.61 [3,7] | 2.05 [3] | 0.23 [3,7] | 0.75 [3] |
| F20 | Apron Feeder to New Tunnel Conveyor C-9 | 0.61 [3,7] | 2.05 [3] | 0.23 [3,7] | 0.75 [3] |

| | | | | | |
|---|---|---|---|---|---|
| F21 | New Tunnel Conveyor C-9 to Deister 7 x 20 Wet Screen | 0.61 [3,7] | 2.05 [3] | 0.23 [3,7] | 0.75 [3] |
| F22 | Deister Horizontal 7 x 20 Wet Screen | 0 [3,8] | 17.06 [3] | 0 [3,8] | 5.94 [3] |
| F23 | Deister Wet Screen to Pipe to Clarifier (via slurry pump) | 0 [6,8] | 0.51 [6] | 0 [6,8] | 0.19 [6] |
| F24 | Deister Wet Screen to Bin/Vibrating Feeder | 0 [5,8] | 1.54 [5] | 0 [5,8] | 0.56 [5] |
| F25 | Vibrating Feeder to Kodiak 400 Cone Crusher | 0 [5,8] | 1.54 [5] | 0 [5,8] | 0.56 [5] |
| F26 | Kodiak 400 Cone Crusher | 0.83 [5,7] | 2.76 [5] | 0.37 [5,7] | 1.23 [5] |
| F27 | Kodiak 400 Cone Crusher to Existing Conveyor C-2 | 0.46 [5,7] | 1.54 [5] | 0.17 [5,7] | 0.56 [5] |
| F28 | Conveyor C-2 to New Conveyor C-10 | 0.46 [5,7] | 1.54 [5] | 0.17 [5,7] | 0.56 [5] |
| F29 | New Conveyor C-10 to Existing Radial Stacker C-7 | 0.46 [5,7] | 1.54 [5] | 0.17 [5,7] | 0.56 [5] |
| F30 | Radial Stacker C-7 to Surge Pile (for Dry Mill) | 0.46 [7] | 1.54 [5] | 0.17 [7] | 0.56 |
| Total | | 21.16 | 91.19 | 8.28 | 34.86 |

[1] Emission rates from AP-42, Table 11.19.2-2 (8/04)
[2] Based on operating 3640 hrs/yr @ 500 TPH; 1,820,000 tons/yr production
[3] Based on operating 3640 hrs/yr @ 375 TPH; 1,365,000 tons/yr production
[4] Based on operating 3640 hrs/yr @ 125 TPH; 455,000 tons/yr production
[5] Based on operating 3640 hrs/yr @ 281.3 TPH; 1,023,932 tons/yr production
[6] Based on operating 3640 hrs/yr @ 93.8 TPH; 341,432 tons/yr production
[7] Control Efficiency = 70%
[8] Control Efficiency = 100 %

## Fugitive Emissions - Quarry Plant (Equipment Removal) [1]

| Fugitive Emission Point | Source | Controlled PM Emissions (tpy) | Uncontrolled PM Emissions (tpy) | Controlled $PM_{10}$ Emissions (tpy) | Uncontrolled $PM_{10}$ Emissions (tpy) |
|---|---|---|---|---|---|
| WP01 | Truck unload to Grizzly Feeder (F-1) | 0.01 [2,5] | 0.03 [2] | 0.0 [2,5] | 0.01 [2] |
| WP02 | Grizzly Feeder (F-1) to Conveyor C-1 | 0.16 [4,5] | 0.55 [4] | 0.06 [4,5] | 0.20 [4] |
| WP03 | Grizzly Feeder (F-1) to Gyratory Crusher | 0.66 [3,5] | 2.18 [3] | 0.24 [3,5] | 0.80 [3] |
| WP04 | Gyratory Crusher (GO) | 0.15 [3,5] | 0.51 [3] | 0.52 [3,5] | 1.75 [3] |
| WP05 | Gyratory Crusher (GO) toConveyor C-1 | 0.66 [3,5] | 2.18 [3] | 0.24 [3,5] | 0.80 [3] |
| WP06 | Conveyor C-1 to Conveyor C-2 | 0.66 [3,5] | 2.18 [3] | 0.24 [3,5] | 0.80 [3] |
| WP07 | Conveyor C-2 to Conveyor C-3 | 0.82 [2,5] | 2.73 [2] | 0.30 [2,5] | 1.00 [2] |
| Total | | 3.11 | 10.37 | 1.61 | 5.37 |

[1] Emission rates from AP-42, Table 11.19.2-2 (8/04)
[2] Based on operating 3640 hrs/yr @ 500 TPH; 1,820,000 tons/yr production
[3] Based on operating 3640 hrs/yr @ 400 TPH; 1,456,000 tons/yr production
[4] Based on operating 3640 hrs/yr @ 100 TPH; 364,000 tons/yr production
[5] Control Efficiency = 70 %

## Fugitive Emissions - Batch Plants Nos. 1 and 3 Flyash Silos

| Fugitive Emission Point | Source | Controlled PM Emissions (tpy) | Uncontrolled PM Emissions (tpy) | Controlled $PM_{10}$ Emissions (tpy) | Uncontrolled $PM_{10}$ Emissions (tpy) |
|---|---|---|---|---|---|
| BH14 | BP #1 Flyash Silo Filling | 0.056 | 5.62 | 0.036 | 3.59 |
| BH15 | BP #3 Flyash Silo Filling<br>BP #3 Flyash to Weigh Hopper | 0.112<br>0.001 | 11.23<br>0.08 | 0.072<br>0 | 7.18<br>0.04 |
| Total | | 0.17 | 16.93 | 0.11 | 10.80 |

Based on AP-42, Table 11.12-2 (10/01)
Based on Batch Plant No. 1 permit production limit of 624,000 ton/yr
Based on Batch Plant No. 3 permit production limit of 1,248,000 ton/yr

### Fugitive Emissions - Two Storage Piles

| Storage Piles | Production (tpy) | PM Emission Factor [1] (lb/ton) | PM Emissions (tpy) | $PM_{10}$ Emission Factor [2] (lb/ton) | $PM_{10}$ Emissions (tpy) |
|---|---|---|---|---|---|
| two stockpiles | 1,820,000 | 4.29 E-02 | 39.04 | 2.03 E-02 | 18.47 |

[1] Based on U=15 mph, M=0.7, k=0.74 (AP-42, Section 13.2.4, 10/95); EF = $k(0.0032)[(U/5)^{1.3}/(M/2)^{1.4}]$
[2] Based on U=15 mph, M=0.7, k=0.35 (AP-42, Section 13.2.4, 10/95); EF = $k(0.0032)[(U/5)^{1.3}/(M/2)^{1.4}]$

### Total Emissions - Facility Modification

| Pollutant | 545 kW Diesel Engine Generator (tpy) | Quarry Plant (tpy) | Quarry Plant (equipment removal) (tpy) | Batch Plants Nos. 1 and 3 Flyash Silos (tpy) | Storage Piles (tpy) | Total Emissions (tpy) |
|---|---|---|---|---|---|---|
| $NO_x$ | 36.03 | | | | | 36.03 |
| CO | 16.11 | | | | | 16.11 |
| $SO_2$ | 8.80 | | | | | 8.80 |
| $PM/PM_{10}$ | 2.04/2.04 | 21.16/8.28 | 3.11/1.61 | 0.17/0.11 | 39.04/18.47 | 59.30/27.29 |
| VOC | 0.68 | | | | | 0.68 |
| Total HAPS | 3.70 E-03 | | | | | 3.70 E-03 |

**<u>Air Quality Assessment</u>:**

The applicant conducted an ambient air quality impact analysis (AAQIA) for the 545 kW diesel engine generator. An ambient air quality impact analysis was not performed for the rock crushing equipment or flyash silos since the Department of Health air modeling guidance generally exempts an ambient air quality impact analysis for fugitive dust sources and intermittent dust sources.

The applicant used the ISCST3 model as implemented in Bee-Line Software's BEEST program to determine source compliance with the National and State Ambient Air Quality Standards (NAAQS/SAAQS). The modeling as well as the methodology and assumptions employed by the applicant have been determined to be acceptable and are discussed below.

The assumptions used in the ISCST3 modeling include the following:

a. Rural land use parameter
b. Ambient temperature of 298.15 K
c. Meteorological data
   5 years of meteorological data from Honolulu Airport (1990-1991, 1993-1995). The 1992 data set was not utilized by the applicant due to excessive missing data.
d. Terrain
   The applicant utilized actual terrain heights at the selected receptor points from Hawaii USGS Digital Elevation Model (DEM) data, 7.5 minute maps (Kaneohe and Waipahu quadrangles).
e. Receptor locations
   Receptors were located in areas considered ambient air. Receptors were placed at a fine receptor grid of 30 meter spacing. There were 1150 receptor locations in total.

f. Downwash
The building downwash option was activated. The EPA Building Profile Input Program (BPIP) was used to derive the direction specific building dimensions for importing into the ISCST3 model. The program was used to determine the GEP stack height, analyze potential structure-induced downwash effects and calculate the building downwash parameters for ISCST3. All structures near the stacks that could cause downwash were assessed for downwash effects.

g. Background data
The background data consisted of 2002 data from West Beach ($NO_x$) and Honolulu ($SO_2$, CO, $PM_{10}$).

Based on these assumptions, the emissions impact from the proposed 545 kW diesel engine generator will be in compliance with all State and Federal ambient air quality standards. The results are shown below.

**Stack Parameters - 545 kW DEG**

| Stack Parameters | Height (ft) | Temperature (deg F) | Diameter (ft) | Velocity (ft/s) | Flow Rate (cfm) |
|---|---|---|---|---|---|
| 545 kW DEG | 18 | 942.01 | 0.6667 | 226.13 | 4736.5689 |

**Emission Rates - 545 kW DEG**

| Emission Rates | $SO_2$ (g/s) | $NO_2$ (g/s) | PM (g/s) | CO (g/s) |
|---|---|---|---|---|
| 545 kW DEG | 0.36918 | 1.51326 | 0.08568 | 0.67662 |

**Total Ambient Air Quality Impacts - 545 kW Diesel Engine Generator**

| Air Pollutant | Averaging Period | Impact ($\mu g/m^3$) | Background Concentration [1] ($\mu g/m^3$) | Total Impact ($\mu g/m^3$) | SAAQS ($\mu g/m^3$) | % of SAAQS [2] |
|---|---|---|---|---|---|---|
| $NO_x$ | Annual | 1.4 [3] | 8 | 9.4 | 70 | 13.43 |
| CO | 1-hr | 5216 | 3990 | 9206 | 10000 | 92.06 |
| | 8-hr | 652 | 1582 | 2234 | 5000 | 44.68 |
| $SO_2$ | 3-hr | 949 | 30 | 979 | 1300 | 75.31 |
| | 24-hr | 119 | 9 | 128 | 365 | 35.07 |
| | Annual | 0.33 [3] | 3 | 3.3 | 80 | 4.13 |
| $PM_{10}$ | 24-hr | 27.5 | 90 | 118 | 150 | 78.67 |
| | Annual | 0.077 [3] | 15 | 15.1 | 50 | 30.20 |

[1] Background data based on 2002 data at Honolulu ($SO_2$, $PM_{10}$ and CO) and West Beach ($NO_2$).
[2] Only the State ambient air quality standards are shown as they are more restrictive than the Federal Standards.
[3] The 6,000 hrs/yr annual operating restriction was not included in modeling concentrations.

**Significant Permit Conditions:**

Revised Attachment IIA for the Aggregate Processing Facility with the following changes:

1. Added to the equipment list the quarry plant's 50 x 24 grizzly feeder, 653 portable jaw crusher, 625 tph roller cone crusher, 8 x 24 screening tower, 7 x 20 wash screen, 2500 ft of conveyors, and 545 kW diesel engine generator.

2. The quarry plant's 653 portable jaw crusher, 625 tph roller cone crusher, 8 x 24 screening tower, 7 x 20 wash screen, and 2500 ft of conveyors are subject to the requirements of NSPS Subpart OOO.

3. Removed the wet mill plant's apron feeder and gyratory crusher, and the dry mill plant's crusher (CR1), from the permit.

4. The maximum hours of operation of the 545 kW diesel engine generator shall not exceed 6000 hours in any rolling twelve (12) month period.

5. The 545 kW diesel engine generator shall be fired only on diesel no. 2 with a maximum sulfur content not to exceed 0.5% by weight.

6. Included the visible emission standard from NSPS Subpart OOO. The quarry plant's 8 x 24 screening tower, 7 x 20 wash screen and 2500 ft of conveyors are subject to a 10% opacity limit. The 653 tph portable jaw crusher and the 625 tph roller cone crusher are subject to a 15% opacity limit. Annual performance opacity testing per NSPS Subpart OOO and monthly visible emissions monitoring were also included.

7. Included recordkeeping and semi-annual reporting for the 545 kW diesel engine generator's hours of operation and sulfur content of the fuel.

8. Included annual emissions reporting for the 545 kW diesel engine generator.

Revised Attachment IIB for the concrete batch plants, specialty products plant and portable soil screener with the following changes:

Added to the equipment list a 150 ton flyash silo with baghouse at concrete batch plant no. 1 and a 150 ton flyash silo and flyash weigh hopper with baghouse at concrete batch plant no. 3.

**Conclusion and Recommendations:**

Recommend issuing a renewal to Covered Source Permit (CSP) No. 0311-03-C, which would supersede the existing Covered Source Permit (CSP) No. 0311-03-C, issued on January 3, 2003, in its entirety. The covered source permit would incorporate the changes requested in the significant modification application and be subject to the significant permit conditions noted above. A 30-day public comment period and 45-day EPA review period are also required.

Reviewer: Darin Lum
Date: 11/04